

**Non Timber Forest Produce: A study on  
livelihood dependency of the tribal population  
(Kutia Kondh) of Kandhamal district, Odisha**

*A  
THESIS SUBMITTED TO  
THE ORISSA UNIVERSITY OF AGRICULTURE AND  
TECHNOLOGY  
IN PARTIAL FULFILMENT OF THE REQUIREMENT  
FOR THE DEGREE OF  
MASTER OF SCIENCE  
IN  
FORESTRY  
(FOREST PRODUCTS AND UTILISATION)*

*By  
Sushri Sasmita Sahoo*

**Adm. No. 06FPU/14**



**DEPARTMENT OF FOREST PRODUCTS AND UTILISATION  
COLLEGE OF FORESTRY  
ORISSA UNIVERSITY OF AGRICULTURE AND  
TECHNOLOGY  
BHUBANESWAR-751003  
2016**



**ORISSA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**  
**DEPARTMENT OF FOREST PRODUCTS AND UTILISATION**  
**COLLEGE OF FORESTRY**  
**BHUBANESWAR**


**Mrs. Smitha G Nair**  
Assistant Professor,  
Forest Products and Utilisation,  
College of Forestry, OUAT  
Bhubaneswar- 751003

Bhubaneswar  
Date: 1.8.2016

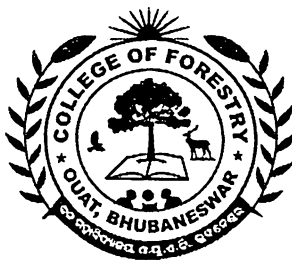
**CERTIFICATE-I**

This is to certify that the thesis entitled “**Non Timber Forest Produce: A study on livelihood dependency of the tribal population (Kutia Kondh) of Kandhamal district, Odisha**” submitted in partial fulfilment of the requirements for the award of the degree of **MASTERS OF SCIENCE IN FORESTRY (FOREST PRODUCTS AND UTILISATION)** to the Orissa University of Agriculture and Technology is a faithful record of *bonafide* and original research work carried out by **Sushri Sasmita Sahoo, Adm. No. 06FPU/14** under my guidance and supervision. No part of this thesis has been submitted for any other degree or diploma.

It is further certified that the assistance and help received by her from various sources during the course of investigation has been duly acknowledged.

  
1/8/2016  
**CHAIRMAN**

**ADVISORY COMMITTEE**



## CERTIFICATE-II

This is to certify that the thesis entitled “Non Timber Forest Produce: A study on livelihood dependency of the tribal population (Kutia Kondh) of Kandhamal district, Odisha” submitted by Sushri Sasmita Sahoo, Adm. No. 06FPU/14 to the Orissa University of Agriculture and Technology, Bhubaneswar in partial fulfilment of the requirements for the degree of Master of Science in Forestry (Forest Products and Utilisation) has been approved/disapproved by the students’ advisory committee and the external examiner.

### Advisory Committee

#### Chairman

**Mrs. Smitha G Nair**

Assistant Professor,  
Forest Products and Utilisation,  
College of Forestry,  
O.U.A.T., Bhubaneswar

*Smitha G Nair*  
27.8.16

---

### Members

**1. Dr. M.M. Hossain**

Professor,  
Dean,  
College of Forestry,  
O.U.A.T., Bhubaneswar

*M.M. Hossain*  
27.08.16

---

**2. Mr. S. Nayak**

Assistant Professor,  
Forest Products and Utilisation,  
College of Forestry,  
O.U.A.T., Bhubaneswar

*S. Nayak*  
27/8/16

---

**External Examiner**  
(Name & Designation)

*Anandarupa Nath Singh*  
27/08/16  
Assoc. Prof Forestry  
UBKV, Pund. Bani, Goser Behal

---

## ACKNOWLEDGEMENT

At this platform, I am deeply privileged to evince a word of thanks to everyone who played a positive role in the completion of my project.

With the blessings of “Lord Shiva” and the abstruse abetment of “Lord Jagannath”, I have completed a successful journey of my research work on the meandering road with an unswerving destination.

At first I owe a lot to my Bau and Bapa; yes I have seen the God in my parents. Although it is like a drop in the ocean, yet, I would like to avail this opportunity to express my heartiest sense of reverence and immense love to my most venerable parents for their supreme sacrifice, lovable inspiration and eternal beautification in evaluation of this tiny personality and elders whose inspiration and assistance have paved me the way of achieving success in my career.

I feel it elysian pleasure in expressing my regards and reverence to my esteemed thesis advisor Mrs. Smitha G Nair, Assistant professor (Forest Products and Utilisation), College of Forestry, OUAT, BBSR, for her help, unconditional support, understanding, insightful guidance and incomparable supervision for successful completion of my research work. Without her assistance it would have been difficult for me to shape up this work.

I would like to express my heartfelt gratitude to my Co-Guide Dr. M. M. Hossain, Dean, College of Forestry, OUAT, BBSR, for his kind suggestion and blessings during post-graduation period.

I take pleasure to express my sincere and deep sense of reverence to my Co-Guide Mr. Saswat Nayak, Assistant professor (Forest Products and Utilisation), College of Forestry, OUAT, BBSR, who with his inspiration, generous help, endless patience and constant encouragement made me work on the project.

I take pleasure to convey my deep sense of gratitude to Lillymoni Madam and Hiranmayee Madam for their inspiration.

I would like to express my deep appreciation to Bhola Sir, Prasanjit Sir, Bibhuti Sir, Baburam Sir, Manoj Sir, Tanmay Sir, Ranjan Sir, Madhab Sir for their valuable suggestions, advice, steady encouragement during preparation of this manuscript.

I avail the opportunity with great pleasure to express my deep appreciation, affection and heartfelt thanks to Adi, Binty and Swapna for their unconditional help, inspiration, co-operation and moral support for successful completion of this investigation.

I am thankful to my friends Sudha, Monali, Subhasri, Khirabdhi, Sweta, Suku, Sunita Kumari, Sini, Sucheta, Trupti and Asutosh for their help and inspiration.

I owe my special thanks and heartfelt gratitude to Mr. V. Karthic (IFS), DFO, Balliguda forest division, Odisha, for his great support and guidance, which have been of great value in carry out this research.

I am extremely grateful to Mr. Narayana Swain, Forester, Belghar and Rinku bhai for their help during data collection and co-operation of the local forest dwellers during my study.

I express my deep sense of regard to Mr. Ananta Sarkar, senior scientist (Department of Agriculture Statistics), CIWA, for his guidance and suggestion in analysis for improvement of my research work.

Last but not the least, I wish to express my unfathomable love and affection to Mamuni nani, Manas bhai and Chiku for always being there as a friend, philosopher and guide, whenever I needed them.

Bhubaneswar  
Date- 1.8.16

*Sushri Sasmita Sahoo*  
(Sushri Sasmita Sahoo)

## CONTENTS

<b>CHAPTER NO.</b>	<b>CHAPTER</b>	<b>PAGE NO.</b>
<b>I</b>	<b>INTRODUCTION</b>	<b>1-4</b>
<b>II</b>	<b>REVIEW OF LITERATURE</b>	<b>5-20</b>
<b>III</b>	<b>MATERIALS AND METHODS</b>	<b>21-31</b>
<b>IV</b>	<b>RESULTS AND DISCUSSION</b>	<b>32-57</b>
<b>V</b>	<b>SUMMARY AND CONCLUSION</b>	<b>58-62</b>
	<b>REFERENCES</b>	<b>i-xii</b>
	<b>APPENDICES</b>	<b>I-VII</b>

## LIST OF FIGURES

<b>FIGURE NO.</b>	<b>PARTICULARS</b>	<b>PAGE NO.</b>
1.1	Kutia Kondh woman with her children	4
1.2	The view of a house of Kutia Kondh	4
3.1	Map showing Study area	22
3.2	The view of a village of Kutia Kondh	25
3.3	Office of KKDA	25
3.4	Interaction of researcher with the Kutia Kondh people	28
4.1	Age classes of surveyed respondents	33
4.2	Literacy levels of the households	34
4.3	Size of the land holding of the respondents	36
4.4	Slash burning for shifting cultivation	39
4.5	Clearing of forest patch for shifting cultivation	39
4.6	Different NTFPs in the study area	45
4.7	Percentage income contributions from sale of different sources of NTFP	49
4.8	Economics of different NTFPs	51

## LIST OF TABLES

TABLE NO.	PARTICULARS	PAGE NO.
3.1	Demographic profile of Kandhamal district 2011	23
3.2	Block wise Scheduled Tribes and Scheduled Castes Population: 2011	24
4.1	Major tribal villages surveyed in the study area	32
4.2	Socio-economic profiles of the respondents	35
4.3	Percentage of sample respondents in different sectors	37
4.4	Composition of employment in different sectors	40
4.5	Composition of average annual household income derived from different sectors (Household/year)	41
4.6	Information on NTFPs in the study area	44
4.7	Seasonal contribution of NTFPs and the employment generate	46
4.8	Contribution of different NTFPs to cash income	48
4.9	Economics of NTFPs collectors (HH/year)	52
4.10	Share of household variables in cash income from NTFPs	54
4.11	Respondent's opinion on problems by priority (Percentage)	55

## **ABBREVIATIONS USED**

CIFOR	Centre for International Forestry Research
DSO	District Statistical Office
FAO	Food and Agriculture Organisation
GP	Grama Panchayat
HH	Household
INR	Indian Rupee
ITDP	Integrated Tribal development Programme
KKDA	Kutia Kondh Development Agency
MFPs	Minor Forest Products
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
NAC	Notified Area Council
NGO	Non-Governmental Organization
NTFP	Non-Timber Forest Produce
NTFPs	Non-Timber Forest Products
NWFPs	Non-Wood Forest Products
OTELP	Orissa Tribal Empowerment and Livelihoods Project
PVTGs	Particularly Vulnerable Tribal Groups
SC	Scheduled caste
ST	Scheduled tribe
USDA	United States Department of Agriculture

## ABSTRACT

A thesis entitled “Non Timber Forest Produce: A study on livelihood dependency of the tribal population (Kutia Kondh) of Kandhamal district, Odisha” was carried out in the Tumudibandh block of Balliguda subdivision of Kandhamal district with the objective of studying about different livelihood activities being carried out in the study area, contribution of NTFP to the tribal livelihood and main factors that are affecting the tribal livelihoods and income. The number of respondents for this study was 120 and they were randomly selected. The data were collected through a structured survey questionnaire, analysed with appropriate statistical methods and were interpreted in accordance with the objectives of the study. Tobit analysis was used to determine the factors influencing the share of NTFP in income. The major findings of the study revealed that NTFP collection is performed by all households irrespective of income contribution. The maximum employment (35%) was generated by the wage sector followed by NTFP collection (25%), shifting cultivation (20%) and other sectors (20%). Also, wage earnings generated the highest average annual income per household (INR.9222) followed by NTFP (INR.7023), shifting cultivation (INR.4657) and other sectors accounting 15% to the total income of the Kutia Kondhs. The higher contribution of wage income to the total income of Kutia Kondhs is due to the employment given under MGNREGA. This fetches a higher wage rate (INR.174/day) compared to the opportunity cost of labour in NTFP (INR.90/day). However, they preferred to work as labour only in the lean season of NTFP. Results of the Tobit model indicate a positive significant relationship between total hours of collection ( $b= 1.785$ ) and family size ( $b= 1.887$ ) with income share of the NTFP. A negative relationship with income variables such as shifting cultivation income ( $b= -2.565$ ) and wage income ( $b= -2.214$ ) was found to be statistically significant at 99 % and 95% confidence level respectively. These variables influenced the share of NTFP in income. The main problems faced by the Kutia Kondhs based on the primary observations were the act that is associated with extraction of NTFP and commuting. They did not express any concern over the restrictions imposed by the forest department to the collection of NTFP. Majority of the respondents disagreed to the fact that there is an inadequacy of food. Sustainable management of the forest resources along with the commercialization of the products can help improve the livelihood of the tribals and ensure their financial security.

# **CHAPTER-1**

---

## **INTRODUCTION**

# INTRODUCTION

---

Forest is an important renewable, natural resource, which greatly influences the socio-economic development of any rural community (Ghosal, 2011). It plays a leading role in enhancing the quality of environment we live in and also influences the livelihoods of the people. Forests are intrinsically linked with our culture and civilization. Local people depend on forest resources for various products such as fuel wood, construction materials, medicine, and food. They provide timber as raw materials for various industries like pulp and paper, news print, board, furniture items, packing materials, matches, sports goods etc., apart from several other forest produce popularly known as Non Timber Forest Produce. The term Non Timber Forest Produce was coined by De Beer and Mc Demott (1989) and embodies all biological matter of wild plants and animals other than timber extracted from forests and woodlands (CIFOR, 2011). NTFP include all products obtained from the forests like fruits, nuts, vegetables, medicinal plants, resins, bark, fibers, palms, grasses as well as small wood products and firewood, amongst others (FAO, 2006). The terms NTFP (Non Timber Forest Produce), NTFPs (Non Timber Forest Products), NWFPs (Non-Wood Forest Products), MFPs (Minor Forest Products) and Special Forest Products are all used interchangeably by many. Considering their economic, social, cultural and environmental importance, it has been commonly referred to as Non Timber Forest Products and seldom as Minor Forest Products.

NTFP denote a wide variety of food and food additives (edible nuts, mushrooms, fruits, herbs, spices and condiments, aromatic plants), fibers (used in construction, furniture, clothing or utensils), resins, gums, and plant and animal products used for medicinal, cosmetic or cultural purposes (FAO 2008). NTFP are numerous and versatile and vary in their extraction methods, processing and marketing. Yet, they play a very vital role in the social, cultural and economic aspects of the life of the rural people of all developing countries. Globally, an estimated 350 million people mostly in developing countries depend on NTFP as their primary source of income, food, nutrition, and medicine (UND, 2004; FAO, 2005). Non Timber Forest Produce contribute significantly to the livelihoods of people in rural Africa, Asia and other developing countries. NTFP contribute in different ways to the rural household

economy of especially the tribals and other forest dwellers. Some products may be regular sources of income whereas some others may act as safety net in times of crises like crop failures (Shackleton and Shackleton, 2004). They also provide nutritional and health security to the tribals. In industrialized countries, the collection of NTFP may be regarded as a marginal activity where as studies in the tropical forests suggest that they generate higher income than those generated from timber (Peters *et al.*, 1989). NTFP are very important for sustaining rural livelihoods, reducing rural poverty, biodiversity conservation and facilitating rural economic growth (Global NTFP partnership, 2005). The forests of India harbor about 3000 different types of NTFP that vary widely in their utilisation, collection, seasoning and extraction methods (Das, 2005).

India, which is one of the richest biodiversity regions of the world also, has a rich and varied tribal population. There are 437 different tribal groups in the country. Odisha, the third largest tribal populated state in the country, is inhabited by 62 tribes (Appendix III). 13 tribal groups out of these 62 tribes in Odisha are included in "Particularly Vulnerable Tribal Groups" (PVTGs) (Appendix II). These are socially as well as economically backward tribes which have little access to the resources for their development, low level of literacy, relatively small population size and are highly dependent on the forest for livelihood. Many of these groups are landless or have very small land holdings and majority of them practice shifting cultivation on unproductive lands under rainfed condition.

Kutia Kondh is one among the PVTGs and they are distributed in Kandhamal and Koraput district of Odisha. Non Timber Forest Produce (NTFP) are important sources of income for this tribe, Kutia Kondh. Though this is a well-known fact and there has been a fair documentation on the types of NTFP collected from the forests, studies to analyse the contribution of the NTFP to the livelihood of the Tribal groups are few in the state. The present study is being proposed to study the contribution of NTFP to income of Kutia Kondh in Kandhamal district and their role in ensuring the food and livelihood security.

**The specific objectives of the study are as follows:**

1. To conduct a simple livelihood survey in the area.
2. To estimate the contribution of NTFP to the tribal income.
3. To analyze the main factors affecting the tribal livelihoods and income.

**Scope of the study:**

India's forest cover is much lower than the required one-third (of the total geographical area) forest cover. The forests are also exposed to human induced deforestation. Being highly diverse in biodiversity and forest types, India's forests also have immense potential for livelihood based activities. The rural population depends predominantly on the natural resources for their livelihood. With the limited forest cover and limited forest resources, there is a huge gap between the demands and the available quantities, which itself are one of the major reasons for the deforestation and forest degradation. Such studies are preliminary measures that will help us understand the production and consumption of forest produces. Information gathered can help better management of the forest resources for poverty alleviation and reduce the gap between the consumption and production which would ultimately conserve our forest resources and simultaneously improve the quality of life of the tribals.



**Fig. 1.1 Kutia Kondh woman with her children**



**Fig. 1.2 The view of a house of Kutia Kondh**

## **CHAPTER-2**

---

## **REVIEW OF LITERATURE**

# REVIEW OF LITERATURE

---

This chapter is intended to report the findings and understandings of past research studies conducted by various research specialists as well as their views and opinions about different aspects of study with similar objectives. This would help utilize meaningful information on the topic and subject them to reasoning and interpretation. The chapter reviews the research studies under these broad topics like; Non Timber Forest Products and livelihoods, factors determining the dependency of NTFPs and Constraints in NTFP based livelihoods.

## 2.1: Non-Timber Forest Products and livelihoods

NTFPs embody all biological matter of wild plants and animals other than timber extracted from forests and woodlands, e.g. fruits, nuts, vegetables, game, medicinal plants, resins, bark, fibers, palms, grasses as well as small wood products and firewood, amongst others (CIFOR, 2011).

Neuman *et al.* (2000) define NTFPs as: “ All the biological materials (other than industrial round wood and derived sawn timber, wood chips, wood based panels and pulp) that may be extracted from natural ecosystems, managed by plantations etc. and be utilized within the household, be marketed or have social cultural or religious significance”.

NTFPs are one of the oldest traded commodities in the world having historical importance (Panayotou *et al.*, 1992). They are all forest extracts excluding timber. For example, bark, roots, tubers, leaves, fruits, flowers, seeds, resins, honey and firewood (Sunderland *et al.*, 2003; Panayotou *et al.*, 1992). They are collected from a wide range of ecosystems such as forests, farm fallow and farmland and used for subsistence livelihoods including food, medicine and bartering.

Research by Heubach *et al.* (2011) in northern Benin showed that income from NTFPs accounted for 39% of total household income and had a strong equalizing effect on it. However, the economic relevance of NTFPs differs between households: poorer households are relatively more dependent on NTFPs in order to fulfill basic needs than wealthier households. However, the latter extract more NTFPs in quantitative terms and have significantly higher cash returns than poorer ones.

A study conducted by Kamanga *et al.* (2009) in Chiradzulu district of Malawi revealed that the People are extremely poor, with 97% having incomes of less than 1 USD/day. Forest income constitutes around 15% of total income; only non-farm income (47%) and agriculture (28%) rank higher. The poorest segment depends more on forest income than the least poor group, but the medium income group exhibits the highest dependence. Fuel wood constitutes the major source of such income followed by fodder.

In Malawi, wild and planted fruit trees on common land make up to 15% of total income (subsistence and cash income) (Kamanga *et al.*, 2009).

In the Republic of Congo, wild plants contribute 10% to households' total food consumption (de Merode *et al.*, 2004) and Babulo *et al.* (2009) calculated that the provision of consumptive forest environmental products (i.e. fuel wood, farm implements, construction materials, wild food items, herbs, medicines) constitutes 27% of the income in northern Ethiopia.

There is growing evidence that Non-Timber-Forest-Products (NTFPs) contribute significantly to maintain livelihoods in rural Africa, Asia and elsewhere in developing countries (Campbell and Luckert, 2002; Cavendish, 2000; Cocks *et al.*, 2008; Shackleton and Shackleton, 2004; Viet Quang and Nam Anh, 2006).

Mamo *et al.* (2007) examined variation in dependence on forest resources among rural households in Chilimo, Ethiopia. He reported that Forest income contributed 39% of the average household income, roughly equal to agriculture, which contributed 40%. Forest income was more important than all other income sources combined for the poorest 40% of households and contributed more to household income than agriculture for 65% of households. While forest income represents 59% of the total household income for the poorest quintile, the contribution drops to 34% for the wealthiest quintile. On the other hand, the rich households derive a larger absolute income from forest resources than the poor households.

NTFPs have three main functions in the household economy of rural communities living in or adjacent to the forest. Firstly, they help to fulfill households' subsistence and consumption needs in terms of e.g. energy and nutrition as well as

medical and construction purposes. Secondly, they serve as a safety-net in times of crises (e.g. income shortages from other income sources, e.g. crop failure) and thirdly, some NTFPs provide regular cash income (Angelsen and Wunder, 2003; Cavendish, 2002; Chileshe, 2005; Shackleton *et al.*, 2007).

Despite the globalization of the World's economy and the rise of industry, NTFPs still remains an important source of income for hundreds of millions for rural livelihoods (Poffenberger, 2006).

In an Indian context the study by Das (2005) states that annually commercial NTFPs contribute more than Rs.3 billion to the Indian economy. Moreover, NTFPs are estimated to generate more than 70% of all employment in the Indian forestry sector.

The study found NTFPs to be an “employment of last resort” among the poorest of the poor in developing countries. The majority of NTFPs are harvested for the purposes of fuel, diet, medicine, forage and fibre and are used by collectors and their family members while some may also be produced for sale or barter (Arnold *et al.*, 2001; Davidson-Hunt *et al.*, 2001; Hegde and Enters, 2000; Sunderlin *et al.*, 2005).

NTFPs are collected by forest dwellers, living within or outside forest areas, for household as well as commercial purposes. Around 400 million people directly and more than 1 billion people indirectly depend on NTFPs throughout the world (Turner, 2001).

NTFPs are increasingly becoming important in terms of rural and urban livelihoods, as there is an established cause-and-effect relationship between poverty and forest degradation in the cause of deriving subsistence households' needs. The role of forests and trees in food security, contribution to water supply, provision of economic alternatives and support to other sectors has been recognized. There has been increased recognition of the value of Non-Timber Forest Products to people's livelihoods. For example, wild foods greatly improve nutrition and increase food security particularly for rural poor (Shackleton and Shackleton, 2004).

While the extraction of NTFPs is work-intensive and yields comparatively low, it only requires few skills and technology and extraction sites mostly are open or semi-open access (Angelsen and Wunder, 2003). These characteristics of NTFP extraction make it an attractive and important income opportunity to the rural poor.

Pervaz (2002), in his study on NTFP sector in Dhading district of Nepal observed that the NTFP generated maximum employment (60.72 %), followed by agriculture (22.30 %), allied activities (15.83 %) and other sources (1.16 %). With regard to income generation, allied activities were the major contributor to the total household income with 34.74 % followed by NTFP (32.08 %) and agriculture (29.50 %).

NTFPs play important subsistence and safety-net roles in the rural economy, but only a small subset of forest products possesses potential for significant cash income and employment generation (Wallenberg and Belcher, 2001).

A very comprehensive study of forest environmental income in Zimbabwe conducted by Cavendish (2000) found wild foods (plants and animals), medicinal plants, various wood and grass uses, forage plants as well as soil and termite uses even to account for 35% of the average rural income.

Mishra *et al.* (2000) stated that NTFPs are the main resource for the functioning of the forest based tribal village ecosystem and form the most important product of the rural capital.

The World Bank (2000) finds that one out of four of the world's poor rely directly or indirectly on forests for their livelihoods. These products are normally considered as minor forest products and not as visible, yet their harvest is a major activity in the rural economy (Panayotou *et al.*, 1992).

While measuring the depth of the relationship between people and forest produce, Byron and Arnold (1999) found that people prefer to generate much of their livelihoods from forests because it is a viable option; however for many, forest dependency is often a last livelihood resort.

The study conducted in the South-West and North-West provinces of Cameroon by Abwe *et al.* (1999) reported that, the total value of NTFP production and marketing exceeded US \$19 million in 1999 and contributed 2.8% to the regional economy. In contrast, timber in this area was predominantly logged-over area, which contributed 5% and while agricultural crops contributed 27%.

Research by Sunderland *et al.* (1999) reconfirms that NTFPs provide sources of food, medicines, and income to many households in Central Africa. Yet, these studies also confirm that the contribution of NTFPs to local and national economies is typically small relative to agriculture. In four forest villages in South-Western Cameroon, NTFPs contributed 9% to the household economy compared with 43% for agriculture. Similar figures are reported for households in South-Eastern Cameroon (NTFPs 1.2%; agriculture 31%) and South-Western Central African Republic (NTFPs 10%; agriculture 51%). Harvesting of wild NTFPs is most important for poor families that have limited or no access to agricultural markets. Wealthy households or those with access to agricultural markets (i.e. those that can sell cash crops) often consume NTFPs, but seldom harvest them for sale.

A study by Wills and Lipsey (1999) in British Columbia estimated that in 1997 the commercial harvest of wild mushrooms, floral greens and other products employed almost 32000 people on a seasonal or full-time basis, which generated direct business revenues of \$ 280 million and overall provincial revenues in excess of \$ 680 million.

In Africa, forest people collect NTFPs for food, fuel, medicines, decorative, construction materials, fodder, industrial raw materials etc. In Sierra Leone, for example, about 14% of foodstuffs and 32% of medicines are produced from NTFPs. About 10% of rural people in Ghana collect NTFPs on a regular basis for their cash income purposes. In Sub-Saharan Africa about 15 million people (15% of rural households) are involved in NTFP collection for cash income purposes only (Byron and Arnold, 1999).

A study in Botswana of the Southern African Plateau (Taylor and Parratt, 1995) depicts that people most likely to be involved in NTFP use (namely rural communities) have very limited access to technology. As such, it is likely that they will end up selling the NTFP in a relatively 'raw' state to an intermediary who will then end up selling it to a processor. The profit margin increases the further up the chain you go and the harvester would thus realise the least profit margin.

A study conducted by Grimes *et al.*, 1994, showed that NTFP would contribute 77 % to the annual net returns, if dry deciduous forests are exploited sustainably. The present value of the NTFP on an average would be US \$ 1182 per hectare, which is,

however much less than that of compared to similar estimation made for Equador where it was US \$ 2830.

The importance of NTFPs in Hantana forest of Sri Lanka was analysed by Abeygunawardena and Wikramasinghe (1992). They observed that one person entered the forest for five days in a week and collected five bundles of fuel wood. Out of these five bundles, one was kept for his own use and others were sold. They reported that the monetary value of the fuel wood collected from the forest per hectare per year was INR.71052 while that of grass was about INR.578. When all NTFPs collected were valued, they found that the monetary value was equivalent to INR.1961 per hectare per year.

Historically, mankind has depended on non-wood resources for meeting basic needs (FAO, 1992).

### **2.1.1: Studies in India**

The study conducted by Kumar (2015) in Dang's district of Gujarat indicates that most employment (42.51%) was generated by the wage sector followed by NTFPs collection (31.67%) and livestock rearing (15.85%). About 42 species of NTFPs were found to be collected and utilized for various purposes such as food, medicines, and raw materials for making implements and also as a source of income.

The results of the study conducted by Ajaz-ul-Islam *et al.* (2013) revealed the average size of forest based direct paid employment among sample population was 19.82 mandays/ household/ annum and the mean income earned from these activities was `2199.70/ household/ annum in the area. The livelihood generation from forest based secondary employment in the study area was nil as no wood-based or Non-Timber Forest Products (NTFPs) based enterprises were established. The average income and unpaid employment generated through NTFPs based self-employment for the surveyed households in the area were estimated to be `4791.16/ household/ annum and 88.22 mandays/ annum. The agriculture contributed major share (36.23%) of total household annual income followed by forest resources (25.05%), labour (9.74%), livestock (8.86%), business/ shop (8.72%), service (6.77%) and others (4.63%).

Bhavannarayana *et al.* (2012) in their study on dependency and usage pattern of the NTFPs in East Godavari District, Andhra Pradesh reported that 38 different plant

species were mostly extracted as NTFPs for food, fodder, fuel, medicine, household and commercial purposes. Of the widely exploited 38 species, 5 (13.5%) are food products, 4 (10.5%) are used as fodder, 13 (34.2%) are commercial, about 8 (21.05%) are used for household purpose, 2 (5.26%) are plants having medicinal properties and the rest are used as fuel.

Saha D and Sundriyal RC (2012) reported in their paper that a total of 343 NTFPs were collected by the tribals of North East India from the forests and were used by them for diverse purposes like medicinal(163), edible fruits(75), vegetables(65) etc. The same paper reveals that the community dependence on forest resources was 100% firewood and construction material. NTFPs contributed 19-23% of the total household income.

Shit and Pati (2012) stated that the NTFPs collected from the forest in Paschim Medinipur district, West Bengal play a significant role in the livelihood of local people, particularly the tribal communities. They also highlight the importance of understanding how tribal communities use forests and the need to broaden the objectives of management of these forests to include a multiplicity of objectives and products with geo-botanical approach.

A total contribution of 23% of the total annual household income was reported (Sarmah R and Arunachalam A, 2011) from the Chaglang district of Arunachal Pradesh. The non-timber forest products were found to be an imperative of the traditional lifestyle in Arunachal Pradesh.

Dattagupta *et al.* (2010) stated that Non- Timber Forest Product (NTFP) plays a significant role in the lifestyle of the forest dwellers of the Inner line Reserve Forest (ILRF) of Cachar, Assam, India. Both tribal and non-tribal communities of ILRF depend on several NTFPs for their livelihood and safety net.

The role of NTFPs becomes more significant for less agriculture dependent communities with small land holders residing in remote forests. Collecting and selling of NTFPs is considered as an important way of using vegetation in sustainable manner. Edible and medicinal plants are principle NTFPs. Types, species and amount of NTFPs are different in different seasons and also influenced by the location. Thirty nine (39)

economically important species utilized by the local people have been recorded from the Jhabua district by Wagh *et al.* (2010).

Singh *et al.* (2010) explored the livelihood vulnerability and stress coping mechanism of the local population of Sundarbans and concluded that NTFP contribution accounted for 79% (on an average) to the total annual income of the collectors-family which included items like firewood, prawn, fishes, crabs etc.

The study conducted by Sawhney and Engel (2003) in Bandhavgarh National Park, India pointed out the majority of the sampled households (97%) collected NTFPs. All the households collecting NTFPs also sold it, though there is a ban on sale of NTFPs. Overall, sale of NTFPs constitutes the most important source (26%) of cash income for the households and the third most important source of total income (13.8%). On an average each household made US \$ 44 from the sale of NTFPs in 2000. From the sale of different source of NTFPs to the total NTFPs income, Amla product (42%) contribute the highest followed by Tendu Patta (41%), mahua (12%) and fuelwood (4%) whereas Chironji (1%) contributed the least.

The role of NTFPs in the economy of communities living in and around forests of South Bihar was highlighted by Vidyarthi and Guptha (2002). Nearly 49 items of the NTFPs found to sustain the people especially landless and marginalized groups during lean season and supplement their income during other seasons. The study showed that NTFPs contributed significantly to the annual income of the households (86%). Besides the economic value of NTFPs, local communities were also enjoying several qualitative benefits from the forest such as medicinal, religious and aesthetic needs.

The study conducted in India (Surayya, 2000) on Contributions of Forests, Microfinance and NTFPs Marketing and Policy interventions for Reducing Poverty portrayed that mean annual income generate by forest dwellers by NTFPs collection and sale was INR.2337, mean income from collection and sale of firewood and livestock sale is accounted to be INR.2500. Whereas income from agricultural source and borrowing and others is uttered to be highest, which were about INR.4846 and INR.3388 respectively.

The study by Rao and Singh (1996) estimated that non- wood forest products offer employment to about one million people every year.

The study by Sekar *et al.* (1996) in the Sathyamangalam Hill LAMP cooperative society, found that around 83 % of the members were tribals who were actively involved in minor forest products collection and earning on an average INR.11180 per annum by spending 8-10 hours in a day for the purpose.

Das (1995) studied the role of NTFPs in the economy of forest fringe dwellers of South West Bengal. He observed that on an average, one NTFP collector working for five to six hours a day could earn INR.17 to 26 from NTFPs and the collection season was more or less distributed throughout the year. He reported that, of the five Forest Protection Committees (FPCs) studied, the average family income from NTFPs varied from INR.6046 in Dalangora FPC to INR.9569 in Khatam.

Namdeo and Pant (1994) highlighted that tendu leaves were estimated to provide employment nearly to 4 million persons annually by way of Bidi (Local cigarette) manufacturing.

The study by Namdeo and Pant (1994) highlighted that, Sal seeds had potential to provide employment to 4.5 million persons for a period of 40 days and regular employment of 300 days per year for 0.436 million persons in processing of Sal seeds. The annual production of the gum Karaya<sup>10</sup> was about 6000 tons and creation of 600000 mandays of work at the rate of 10 kg per person per day.

Campbell (1993) opined that according to some rough calculations based on the valuation of NTFPs, an average return of INR.2720 was realized per hectare annually in India. He observed that forest based enterprises provided up to 50 % of income for 20 to 30 % of labor force in India.

Appasamy (1992) stated that the majority of NTFPs collectors were males in the Palani Hills of Tamil Nadu and higher proportion of the NTFPs collected was used for income generation rather than for home consumption. Fifty percent of the firewood was used for home consumption and the rest was sold.

A study by Gauraha (1992) depicts that, Forest dwellers in Pendra block in Bilaspur district of Madhya Pradesh obtained 70 % of their household income from settled cultivation and sale of NTFPs.

A study on employment, income and expenditure pattern of tribals in the Nasik district of Maharashtra (Raut *et al.*, 1992) found that the collection of minor forest products (MFPs) was found to be the only source of income during the summer season. Wage earning was the prime source of income for landless group, which amounted to the tune of 50 % of the total income.

Collection of NTFPs was a major source of income and employment for forest dwellers. For instance, tendu leaf collection was observed to provide about 90 days of employment to about 7.5 million people every year in India (Mistry, 1992).

Studies in India have revealed that, NTFPs provide substantial inputs to the livelihoods of forest dependent population, many of whom have limited nonagricultural income opportunities (Chandrashekar, 1994; FAO, 1991).

The economic status of tribals (Intodia, 1990) was much below the satisfactory level as 77.87 % of them were having their annual family income less than INR.2500 whereas 13.33 % of them were in the income group of INR.2500 to 3500 and only 9 % of them derived income above INR.3500. Further, he reported that tribals usually had very low family annual income and spent very low amounts even for the necessities.

A study by Thiagarajan (1989) revealed that 75.5 % of the tribal households had low income while the rest 24.5 % of them had high income.

Nandakumar (1988) showed that the mean annual income of the Yerava tribes was INR.4400 per annum among 62 % of the respondents, while 38 % of them belonged to high income group with INR.8850 per annum.

### **2.1.2: Studies in Odisha**

Singh and Sadangi (2012) found that the tribals of Koraput and Rayagada District of Odisha collect Fuel wood, wood, tamarind and mahua as forest produce of high importance whereas leaves, mango kernels, tubers and bamboo as important forest products and timber, gum and raisin, bark, honey, grasses and mushroom as less important forest products.

Rout *et al.* (2010) studied on the role of NTFPs on the livelihood of tribals in Mayurbhanj district of Orissa and found that the dominant tribes involved in using NTFPs in the district are Santhal, Kol, Bhumija, Bhuyan, Mahalis, Sounti and Saharas. He documented about 37 NTFPs used by the tribals of Mayurbhanj.

Behera (2009) stated that Odisha is one of the most backward states of India with 47 per cent of the population living below poverty line. Forests constitute 37 per cent of the state's geographical area and are the major source of income for the poor, particularly tribals. For most of the tribal households, forests provide essential food and nutrition, medicine, fodder, fuel, thatch and construction materials and non-farm income. These products are particularly important in relieving the 'hunger periods' during slack periods of agricultural cycle. Tribal households get 23% of their total income from NTFPs resources from the forest areas in Kandhamal district of Odisha.

The study conducted by Rout and Thatoi (2009) in Similipal Biosphere Reserve (SBR) in Mayurbhanj district of Orissa on ethno-medicinal uses of medicinal plants reported that 32 potential medicinal plants belong to 24 families are used for ailment of various diseases like leucorrhoea, spermatorrhea, piles, sore throat, rheumatism, elephantiasis etc. by Kol tribe living in some villages situated in and around Similipal Biosphere Reserve.

## **2.2: Factors determining the dependency of NTFPs**

The study conducted by Islam *et al.* (2014) on factors Influencing Forest Based Tribal Livelihoods in Jharkhand, revealed that overall income and employment generated through forest resources was Rs. 6990.85/ household/ annum and 108.04 man-days/ household/ annum in the sample villages. Among encouraging factors of forest based tribal livelihoods, NTFPs self-sufficiency was perceived most effective followed by support to livestock rearing, employment generation, income generation, support to agriculture, food and nutrition security, migration decline, utilization of free time, assets creation for emergency, sustenance to traditional and religious activities, poverty alleviation and socio-economic development respectively. Similarly, the most serious discouraging factor of the forest based livelihoods considered among the tribal people was 'labour intensive and less remunerative livelihood' followed by unsafe and unsecured working environment, seasonal subsistence, supplementary income, lack of cooperative societies, limited marketing facilities, influence of middlemen, harassment

by officials in NTFPs collection and marketing, scarcity of transportation facilities, lack of right and responsibilities to access, manage and use forest resources, lack of modern techniques and lack of cold storage facilities respectively.

Melaku *et al.* (2014) reported that the people living in Bonga forest area of Southwest Ethiopia diversified livelihood activities such as crop & livestock production, collection of NTFPs and off farm activities. It was found that the contribution from the major NTFPs (forest coffee, honey and spices) accounted for 47% of annual household income. He also mentioned that the role of NTFPs was influenced by a number of factors. Variables including being native to the area (+), total land holding (+), possession of livestock (+) and access to extension (+) significantly affected forest coffee production. Age of household head (-), land holding (+) and distance of the market from the residence (-) significantly affected honey production. Size of landholding (+), distance to market (-) and distance of the forest from the residence (-) were significant variables determining the NTFP incomes derived by the households.

The contribution of Non-Timber Forest Products (NTFPs) livelihood strategies to rural development & poverty elevation and the factors influencing the contribution of NTFPs to household income was analyzed by Adam *et al.* (2013) in Nuba Mountains, Sudan. The study results revealed that *Adansonia digitata* fruit sale represents a subsistence strategy for some sampled households and accumulative strategy for others, while *Ziziphus spina-christi* and *Balanites aegyptiaca* fruits sale is a subsistence strategy for all the surveyed households. The study results also showed that the income from selling the fruits was positively and negatively influenced by different external and internal factors. The study concluded that any assumption regarding the potential of NTFPs to positively affect rural development depends on their role in an accumulative strategy that lifts people out of poverty. Institutional, technical and financial supports are necessary to influence the future direction of the NTFP contribution toward accumulative strategy.

A study in Chittagong Hill Tracts of Bangladesh (Kar and Jacobson, 2012) depicts that the contribution of different types of NTFPs to household economy varies in terms of subsistence and cash income. However, overall NTFP income is much higher than income from timber or firewood which indicates a larger dependence of the

households on NTFPs. Income data analysis also finds that the poor households are relatively more dependent on NTFPs for their subsistence and cash income than the better-off households.

Rural livelihoods are linked to socio-economic characteristics of households, e.g. household wealth, household composition (e.g. share of women) and percentage of adults with formal education as well as external factors like access to forests, markets and infrastructure, amongst others ((Kamanga *et al.*, 2009; Timko *et al.*, 2010).

Another important factor influencing the usage and importance of NTFPs to households is their ethnic affiliation: Ethnic groups differ by their social and cultural backgrounds, regional provenance and history as well as their traditional source of livelihood (agricultural or pastoral societies). Moreover, they show certain use patterns of plant resources regarding alimentation, energy supply and medicine, amongst others (Bussmann, 2006; Bussmann *et al.*, 2006). Thus, different NTFP use patterns might also result in differences in the economic importance of NTFPs between ethnic groups.

In general, wealthier households in rural African communities are characterized by greater levels of food-sufficiency and diverse income-earning opportunities due to e.g. better education and greater access to farmland (Emerton, 2005). That is, compared to poorer households, their differentiation in terms of income sources and livelihood strategies is augmented and so are their opportunities to cope with social, financial and environmental changes. Subsequently, their dependency on low-return activities like NTFP extraction, measured as the share of income from NTFPs in total household income is likely to be smaller than with poorer households.

Since wealthier households are, in general, better endowed in terms of harvesting equipment and storage opportunities, have greater access to markets and are better connected to trade infrastructure (Angelsen and Wunder, 2003; Arnold and Pérez, 2001) than poorer households, they might be more engaged in NTFP extraction in quantitative terms.

The study by Pandit and Thapa (2002) revealed that the NTFPs grown on marginal lands contributed to farm household economies, as 24 % of the annual

household income in the upper watershed and 13 % in the lower watershed was realized from the sale of NTFPs based products. They also found that the domestication of the NTFPs reduced local people's dependency on NTFPs as well as other forest resources, as the frequency of visit to forest fodder and fuel-wood resources reduced with the increasing NTFPs domestication.

A percentage comparison of income composition and employment of the three tribal communities (Jenu kurubas, Soligas and Betta kurubas) in Madumalai Wild life sanctuary in India by Hegde (1997) showed that Jenu kurubas derived more employment and income from commercial Non- Wood Forest products than the Soligas and Betta kurubas communities. The analysis of the correlation indicates that Jenu Kuruba community was more dependent of forests than others. It was seen that all other sources of income, such as forest labour, wage labour and salaried jobs reduced the reliance of the people on the forest.

### **2.3: Constraints in NTFP based livelihoods**

OTELP (2007) points out that ecological degradation, erratic rainfall and a high risk of drought in the area have resulted in high food insecurity, increasing out-migration and periodic deaths from starvation. Among the disasters ecological imbalance is now seriously undermining the livelihood patterns and increasing vulnerability. In addition to these, a small land base, low agricultural productivity and low incomes have led to rising indebtedness, trapping tribals into a vicious circle of exploitation. The life of the tribals is increasingly vulnerable due to a persistent lack of assured entitlements to their resource base. Land alienation has deprived them of their land; forest legislation has turned them into encroachers on land they have always used; and they have also been disproportionately affected by displacement due to mining operations, irrigation projects, wildlife sanctuaries, etc.

Acharya (2007) has mentioned that, the Wildlife (Protection) Amendment Act 2002 implemented in 2006 bans adivasis (aboriginal tribes) from gathering non-timber forest produce (NTFPs) such as honey, wild herbs, mosses, lichens and fruits for commercial purposes from parks and sanctuaries. Till the ban, Soliga tribes had usufruct rights to collect NTFPs and sell them to their own cooperative LAMPs (Large-scale Adivasi Multipurpose Society) which in turn would auction them to the highest bidder, generally traders who in turn sell the produce to various industries.

Mishra (2007) reported that some social support system to cope during drought periods existed in Oraon tribe. At household level, reduction of food consumption and change in the pattern of food consumption are important coping strategies. The majority of people in this area changed their occupation, when agriculture fails due to drought. Also many households either sold or mortgaged their lands and household assets. Some of the people, including young children migrated temporarily to other places for livelihood.

There is an intricate relationship between livelihood pursuits of tribal communities and surrounding natural resources like forest, land, water-bodies and other flora and fauna. The critical balance between the two is very essential for sustainable livelihoods of forest dwellers in the world in general. The coping mechanisms developed by them are cultural responses to combat the scarcity and poverty conditions that threaten them periodically (Prasad and Eswarappa, 2005).

Reddy and Rao (2003) observed that the Kurumbas and Irulas tribes are the first settlers and occupied and dwelling in the low lands of the Nilgiris are much more subjected to sickle cell anaemia caused due to virulent malaria causing mosquitoes. But it was absent in case of Toda and Kota tribes (Saha, 1976) as it is evident that these two were dwelling in the upland plateau of Nilgiris.

The impact of external agencies like non-tribal moneylenders, traders and extremist's activities creating unrests among the interior tribals result into disturbances in their livelihood. The non-tribal private traders also buy the minor forest produce items from the tribals at low price and false weights and measures (Subramanyam, 2003).

Livelihood security is dependent on two related factors – one, the access to resources to meet the basic needs of a community and, second the state policies in this regard and the attitude of the civil society are reflected in the state policies (Sudarsen and Sumathi, 2003).

Sudarsen and Sumathi (2003) reported that Malayali schedule tribe of Tamil Nadu heavily depends on the forest for their livelihood. With the increasing strictures on access to the forest resources and changes in the policies created by government departments, they are facing acute problems in utilizing the resources. The major

problem is to have a secondary source of income or more precisely to generate their minimum needs of food during the crisis period.

The nutritional problems can be derived from inborn errors of metabolism or from cultural and environmental factors. The problem of malnutrition is associated with the scarcity of food resources in many tribal ecological zones including Eastern Ghats (Subramanyam, 2001). In general the incidence of malnutrition among the tribal population and lack of water conservation attitude<sup>18</sup> in the tribal areas is more, resulting in health problems and other water borne diseases reducing the working capacity among them.

The income and labour relationships in collection of minor forest products examined by Alibaba *et al.* (2000) showed that labour spent on gum and tamarind collection was significant in generating income by tribals in forest areas. Their study concluded that all the tribal households faced problems in searching minor forest products and danger of wild animals. Furthermore there was a need for controlled exploitation of minor forest products in order to give scope for rejuvenation of forests.

Prasad (1993) stated that production of NTFPs fluctuated also between years. He observed that the rural communities living in and around such forests depended only on selling forest produce. The situation could be altered only with alternative sources of employment opportunities for cash income.

In Sundergarh district of Orissa, India (Mahapatra, 1992) money lenders of the area advanced loan to villagers only after they handed over the minor forest products (MFPs) collected. Thus became obligatory for the tribals to sell minor forest products to the lender at a price fixed by the trader.

NTFP collected and sold in unprocessed form through co-operatives in a tribal sub plan area in Rajasthan fetched lower prices (Chakravarty and Verma, 1991). Endeavour by the co-operatives in marketing of NTFPs is an important step in saving the tribals from exploitation by the middleman.

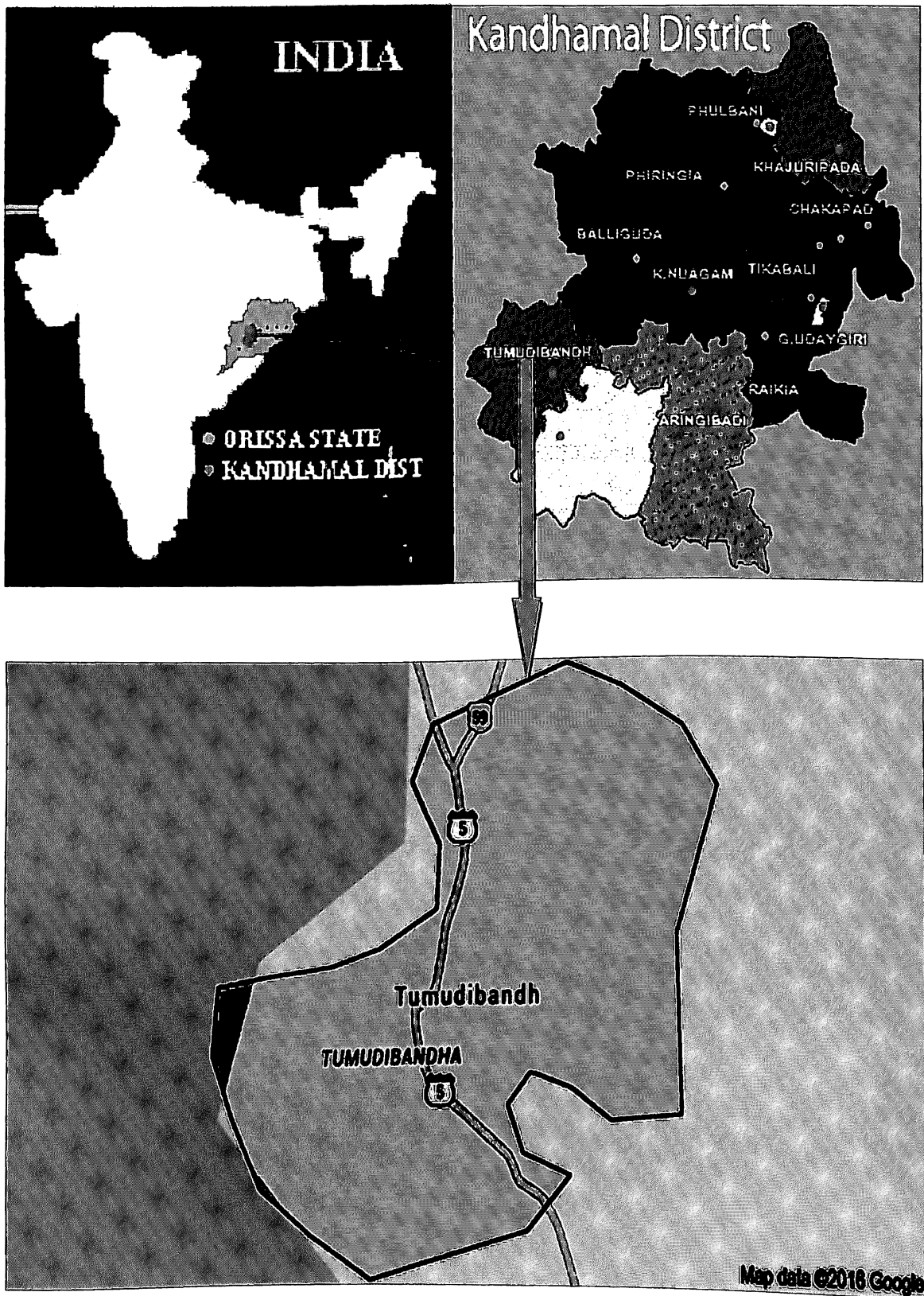
## MATERIALS AND METHODS

---

### STUDY AREA

Odisha is situated in the eastern side of India and is well known for its tribal culture, ethnic group and temples. It is one of the most important ethnographic states of India whose tribal population accounts for 22.43% of the total population of the states. The study has been restricted to the Tumudibandh block of Balliguda subdivision of the Kandhamal district (Fig.3.1), one of the 29 districts of Odisha. The selection of the area was based on the availability of the “Kondhs”, one of the numerically largest tribal groups of Odisha.

Kandhamal district, “the land of the Kandhas or Kondhs,” stretches between 19°34' & 20°36' N latitude and between 83°34' and 84°34' E longitudes with an area 7649 sq. km. The district is located more or less in the central region of the state. The entire district lies in the high altitude zone with inaccessible hilly terrains and narrow valleys. The geographical location of the district is one of the major factors contributing to its development and the socio economical condition of the people. The district is rated as one of the 69 most backward districts of independent India. 53.6% of the total population of the district comprise of tribals; mainly the Kondhs (Kondh means hill dwellers). The district is well known for its scenic beauty, enjoyable climate, coffee gardens, pine jungles, hills and waterfalls, dense forests, ethnic tribal groups and typical tribal life. It is a home to many tribes (of which Kandhas are one), castes and other communities. Nearly 66% of the land area of the district is covered by dense forests, hills, meadows and terraced valleys. The forests are of moist deciduous, dry deciduous and semi evergreen types. Appendix I details the information about the forest types of Balliguda forest division. The area experiences sub tropical hot and dry summers and dry cold winters. The maximum temperature recorded is 45.5°C and minimum is 2°C. The average annual rainfall is 1522.95mm. The major agricultural crops of the region are turmeric, arrowroot, mustard, ginger, black gram etc. The other tribal groups of the district are Santhals, Kandhgouda, Kol, and Soura etc.



**Figure 3.1 Map showing Study area**

## DEMOGRAPHIC PROFILE OF KANDHAMAL

The total population of the Kandhamal district as per the 2011 census is 7,33,110 (males 3,59,945, females 3,73,165). The demographic indicators of the district are given in table 3.1. The ST population is 53.6% and the SC population is 15.8% of the total population in the district. The percentage of ST population per block of the district is given in table 3.2. The urban population constituted only 9.9% of the total population. The district has 2587 villages (including 170 uninhabited villages) covering 153 GPs, 12 Blocks, 2 NACs and 01 Municipality under two subdivisions. The literacy rate is 64.13% compared to 72.9% of the State. The district accounts for 4.10% and 1.61% of the total Schedule Tribe and Schedule Caste population of the State.

**Table 3.1: Demographic profile of Kandhamal district 2011**

INDICATORS		INDICATORS	
Number of Households	172,022	Household Size	4.26
Total Population	7,33,110	Urban Population (%)	9.86
Population-Rural	6,60,831 (R)	Sex Ratio	1,037
Population-Urban	72,279 (U)	Sex Ratio (0-6 year)	962
Population (0-6 years)	1,09,709	Percentage of SC population	15.8
SC Population	1,15,544	Percentage of ST population	53.6
ST Population	3,92,820	Population density (per sq km)	81

Source: Planning and Coordination Department, Government of Odisha

**Table 3.2: Block wise Scheduled Tribes and Scheduled Castes Population: 2011**

Name of the Block	SC Population (%)	ST Population (%)
Khajuripada	31.81	50.27
Phulbani	20.85	56.36
Phiringia	17.61	57.80
Balliguda	10.75	50.29
<b>Tumudibandha</b>	<b>16.75</b>	<b>61.28</b>
Kotagarh	13.72	59.34
Daringbadi	6.95	63.06
KajamandiNuagaon	8.83	51.83
Raikia	11.82	56.65
G.Udayagiri	11.03	65.64
Tikabali	19.93	54.84
Chakapada	25.51	45.45
Total (District)	15.32	53.60

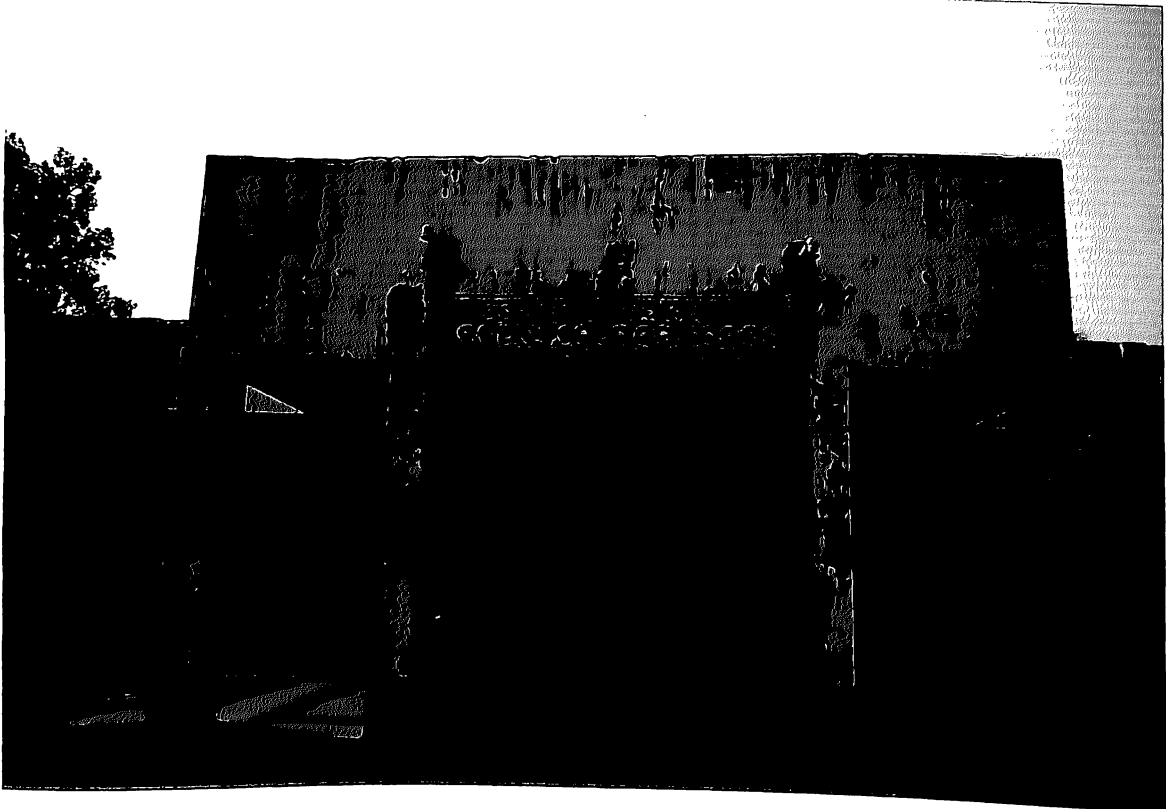
Source: Planning and Coordination Department, Government of Odisha

### **KUTIA KONDH:**

The Kandha or Kondh is numerically the largest tribe of Odisha distributed in various pockets of southern Odisha forming several endogamous territorial sections, namely, Kutia, Dongria, Desia, Sitha, Nanguli, Jhania, Pengo, Jharia, Malua etc. with the suffix Kandha. One of the subgroups of the Kondh tribe is the Kutia Kondh and they are predominantly distributed in the Phulbani or Kandhamal district of Odisha. They constitute a small isolated group characterized by their individual, social, cultural, economic and biological setups. They are mainly found in the south western part of the district, namely the Tumudibandh block of the district. Not only in the state, but also in the Kandhamal district Kondhs are the largest tribe having a population of 3, 66,784 as per 2011 census. The Kutia Kondhs are originally hunters and gatherers and practiced shifting cultivation. These tribes are classified under the ancient Gondid race of proto Austroloid group with considerable Magoloid admixture. They live in more or less isolation from the other societies of the district and have a different life style and show little changes from time immemorial. Based on the parameters of their economy and the response of the community to the changes, they have been classified as the Particularly



**Fig. 3.2 The view of a village of Kutia Kondh**



**Fig. 3.3 Office of KKDA**

Vulnerable Tribal Group (earlier Primitive Tribal Group) by the Government of India. As per the Kutia Kondh Development Agency (KKDA) there are 1138 households in the region distributed mainly in the Gram Panchayats namely Belghar GP, Bilamala GP, Jhiripani GP and Gumma GP of Tumudibandh block.

### **PARTICULARLY VULNERABLE TRIBAL GROUPS (PVTGs)**

The Particularly Vulnerable Tribal Groups (PVTGs) in general are socially as well as economically very backward tribes who have little access to the sources for their development. PVTGs are special class of tribal groups, classified by the Government of India, due to their especially low development indices when compared to other local tribes. These were classified under the Dhebar Commission (1960-61), so as to better facilitate their growth, on par with other STs on national scale. Their characteristics include pre agricultural system of existence (they practice hunting or gathering), zero or negative population growth, extremely low level of literacy and absence of a written language and high dependency on forests. There are seventy-five such tribal communities, which are distributed mainly in four states: Bihar, Odisha, Chhattisgarh and West Bengal. They are distributed in various ecological zones with immense variation in subsistence pattern, technological development, ways of living and contact with the main stream population. There are 13 such groups in Odisha and Kutia Kondh is one among them.

### **LIVELIHOOD OF THE KUTIA KONDH**

The Kondhs of Odisha almost retain their traditional way of life and are still in the stage of subsistence economy (Sahani and Nandy, 2013). Collection of wood and forest produce is their traditional practices. They depend on the forests for food, firewood and medicinal plants. The vast resource of NTFP in the nearby forests and the unfriendly terrain prevents them from shifting their livelihoods to other options. With small land holdings that average to less than 1-2 acres, or landlessness, the Kutia Kondhs of Kandhamal still depend heavily on the forest for their livelihoods. Since the forest resource satisfies the bulk of their material needs for their sustenance and medicinal purposes they heavily depend on the nearby forests.

## **HYPOTHESIS**

The research study was carefully chalked out to test two hypotheses about the significance of NTFP in the life of the PVTG, the Kutia Kondhs.

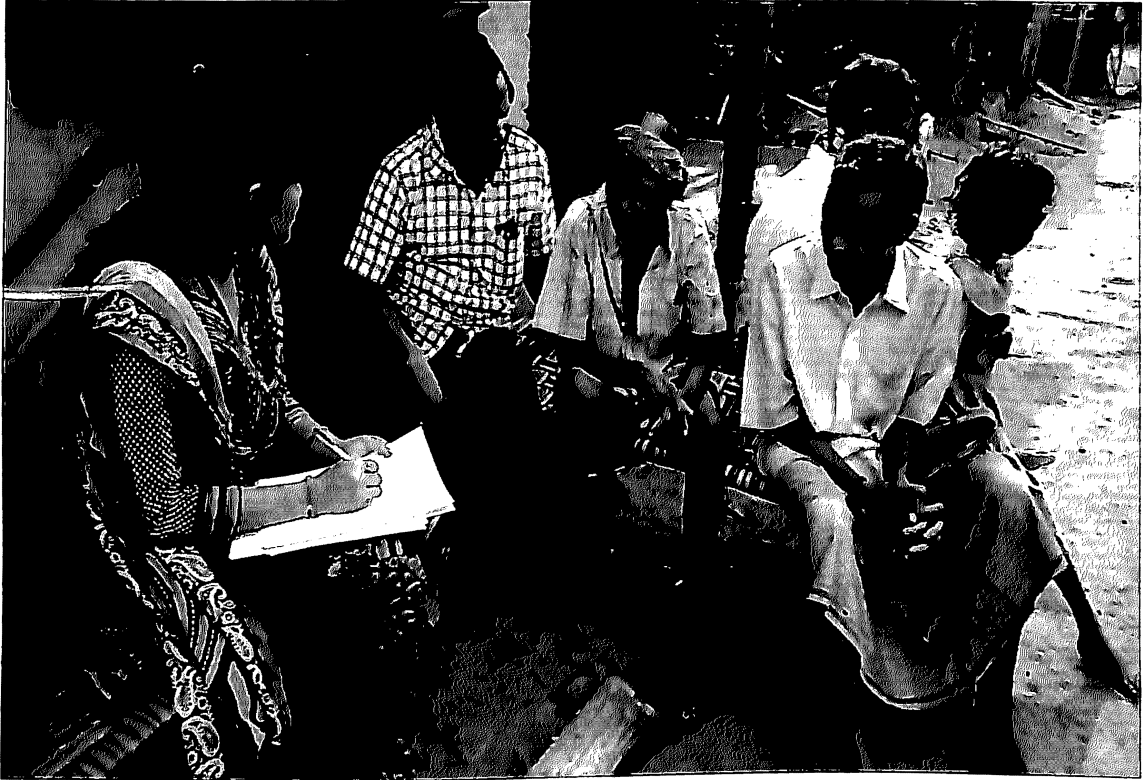
1. NTFP are the major and primary source of income for the tribals.
2. The characteristics of the population like the age, education, family sizes and other employment options influenced the NTFP collection and their economy.

## **METHODOLOGY**

A questionnaire was prepared after a preliminary survey conducted in the area in May 2015. The primary data gave information on the geographic location, area of the villages, occupation pattern, the socio economic aspects of the villages etc. The survey was conducted between August 2015 and June 2016. 120 households were selected randomly from the 4 GPs in the Belghar region, which is dominated by the Kutia Kondhs. The primary data was collected through interviews based on the questionnaire administrated in local language to the respondents (Appendix IV). Each interview took 20-30 minutes. The primary data was collected with the help of the Forest Department officials and included information on NTFP collected and their quantities, demographic information of the respondents (age, gender, literacy level, land holding, community background), total annual earnings, collection timings and availability etc. In addition to primary data, secondary data were also collected from various sources like Kutia Kondh Development Agency (KKDA), District Statistical Office (DSO) and Integrated Tribal development Programme (ITDP) office, Tribal Museum, Balliguda Forest Division etc. Basic statistics about the Kutia Kondhs was taken from KKDA and the district was taken from the official sources of the district.

## **LIMITATIONS OF THE METHODOLOGY**

All the data collected was based on the memory of the tribals. Majority of them are illiterate and they could not give the absolute distance, the actual time, the actual quantity collected etc. They usually collect NTFP in a group and rarely as individuals and many a times the information for a group of collectors were recorded. In order to overcome these limitations of the methodology efforts were made to collect extra



**Fig. 3.4 Interaction of researcher with the Kutia Kondh people**

information through extra questions other than those recorded in the questionnaire. Nearly all possible information about their lifestyle and livelihood were carefully recorded in the field and the data was crosschecked several times with the secondary data collected from KKDA, ITDP office, Forest department, DSO, NGOs etc. The total income generated in a season from NTFP by the Kutia Kondhs was calculated from the quantity of NTFP collected and the price received by them. The results of the study pertain only to this particular tribe and study area and can't be generalised.

## STATISTICAL TOOLS USED

The data was analyzed using the SPSS 16. Descriptive statistics (Mean, percentage, standard deviation) were used to describe the socio economic profile of the NTFP collectors' such as family size, age, education, employment in different sectors and household income in the study area. The income generated in different sectors and the employment generated from different NTFP was analyzed on Microsoft excel. Apart from the descriptive analysis, Tobit model was also used to analyze the relationship between the household characteristics, which are independent variables and percentage of cash income generated from the NTFP.

Tobit model is employed to test the relationship between dependent variable(Y) and explanatory variable (X) and was proposed by James Tobin (1958). The model is also called as censored regression model. Here the dependent variable is the share of household's income from NTFP. In a Censored sample, some observations on the dependent variable, corresponding to known values of the independent variables, are not observable (Y\*). We do not observe the dependent variable over the entire range. Hence, we utilize the Tobit model. Coefficients in a Tobit model are estimated by maximum likelihood method.

The model supposes that there is a latent (i.e. unobservable) variable Y\*. This variable linearly depends on Xi via a parameter (vector) b which determines the relationship between the independent variable Xi and the latent variable Y\* (just as in a linear mode). In addition, there is a normally distributed error term ui to capture random influences on this relationship. The Tobit model is based on the following latent variable model:

$$Y^* = b' X + u$$

Where  $X$  is a  $k$ -vector of regressors, possibly including 1's for the intercept, and the error term  $u$  is  $N(0, S^2)$  distributed, conditionally on  $X$ . The latent variable  $Y^*$  is only observed ( $Y=Y^*$ ) if  $Y^* > 0$ .

Thus the model is  $Y^*=bX + u$

$$Y^* = \begin{cases} bX + u & \text{if } bX + u > 0 \\ 0 & \text{other wise} \end{cases}$$

In this case one cannot rely on only the observation for which  $Y^* > 0$  to estimate the regression equation by ordinary least squares (OLS) because the residuals do not satisfy the condition  $E(u) = 0$  if we consider only those residuals such that  $u > -bX$ .

In the present study, income from NTFP has percentage share to the total household income. Some observations may have hundred percent contributions to the total household income and some may not have corresponding to the households' income who choose to collect forest produce for commercial purpose. Tobit model overcomes bias and inconsistency that arise due to using OLS. Hence Tobit model is used for the present study (Shylajan and Mythili, 2007).

In particular, the actual dependent variable is:

$$Y = \text{Max}(0, Y^*)$$

The definition of the variables included in the model has given below

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + dD_1 + gD_2 + U,$$

Where

$Y$  = Percentage share of household income from the sale of NTFP

$X_1$  = Total annual household income of the family (INR)

$X_2$  = Age of the sample respondents

$X_3$  = Education of the sample respondents

$X_4$  = Distance travelled from home to forest for gathering NTFP (Kms)

$X_5$  = Total time spent on gathering NTFP (Hrs)

$X_6$  = Size of the family (Nr.)

$X_7$  = Shifting cultivation income (INR)

$X_8$  = Farm income (INR)

X9= Livestock income (INR)

X10=Wage income (INR)

X11= Income from services and allied activities

The Tobit model was estimated using LIMDEP software package.

A scoring was used for scaling the problems faced by the tribal respondents. The data was ranked according to the priority of the respondents. In the survey higher scores indicated that they strongly agreed that the particular factor was the most important and significant and vice versa. The percentage differences across the attributes were used to analyze the constraints faced by Kutia Kondhs.

## **CHAPTER-4**

---

### **RESULTS AND DISCUSSION**

## RESULTS AND DISCUSSION

The study on “Non Timber Forest Produce: A study on livelihood dependency of the tribal population (Kutia Kondh) of Kandhamal district, Odisha” was conducted in Kandhamal district of Odisha. A total of 120 Kutia Kondh people from 12 villages belonging to 4 gram panchayats of Tumudibandh block (Balliguda subdivision, Kandhamal district) were personally interviewed with a structured schedule. The data obtained were processed, statistically analyzed and the results have been presented below in accordance with the objectives set for the study. The findings and the interpretations are cited side by side for better understanding and collation.

Table 4.1 shows the major villages in the area surveyed and the number of respondents taken from each village. The numbers of respondents were selected randomly and are proportionate to the village sizes.

**Table 4.1: Major tribal villages surveyed in the study area**

Sl. No.	Name of the village	No. of respondents
1	Munduti	13
2	Similipadara	7
3	Desughati	9
4	Kranja	7
5	Nuamunda	11
6	Tidipadara	15
7	Kadapana	10
8	Deoghar	7
9	Bulubara	9
10	Dhumamaska	13
11	Jamuguda	9
12	Garanga	10
	<b>Total</b>	<b>120</b>

## **4.1: OBJECTIVE-1: TO CONDUCT A SIMPLE LIVELIHOOD SURVEY IN THE AREA.**

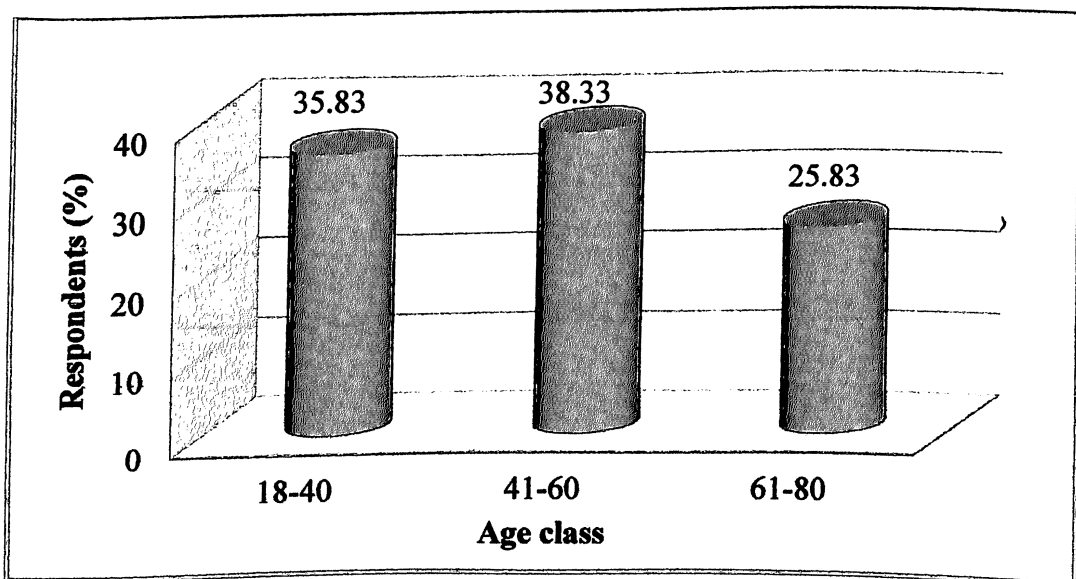
### **4.1.1: Socio-economic characteristics of the Kutia Kondhs**

#### **4.1.1.1: Family size**

The basic information about the households is presented in table 4.2. Average household size was 5.42 with an average 1.91 adult males, 1.51 adult female and 2.77 children. Kutia Kondhs prefer early marriages and live in nuclear families. This could be the reason for small family sizes. Similar results have also been reported by Tiwari and Campbell (1995), Kumar (2015) and Tejaswi (2008). It was observed that the nature of the family was more a traditional character and preference rather than level of education or employment. This is in contrast with the observation of Parvathamma (2004) where it was observed that the level of education was positively related to the formation of nuclear families.

#### **4.1.1.2: Age of respondents**

Most respondents were in the age group of 41 to 60 years (38.33%), followed by 18 to 40 years age group (35.83%). The age group of 61 to 80 years contained the least respondents (25.83%). Figure 4.1 depicts the age classes of the respondents.



**Figure 4.1 Age classes of surveyed respondents**

It shows that there is not much difference in the number of respondents between different age groups. People of all age groups are involved in different activities like collection of NTFP, agriculture, wage labour and allied activities. While taking the observations on age, one of the major problems encountered was the inability of the respondents to mention their exact age, especially the age of the elder generation. The age was therefore carefully noted by considering certain factors like whether they are receiving old age pensions, their physic, their health condition etc. The percentage obtained in the category 61 to 80 years was much higher than those reported by others. Kumar (2015) reported only 8.9% in the category of 61-80. This may also be interpreted as high age expectancy. The absence of diseases may be attributed to the food and nutritional stuffs and medicinal plants they obtained from the forests or the pristine environment in which they live in.

#### 4.1.1.3: Literacy level

The literacy levels of the respondents are evident in Fig 4.2. The literacy rate of adult males (28.18%) was much higher than adult females (7.90%). Literacy was highest for children (41.91%) because of tribal development and free educational programmes of the Government. Free mid-day meals also contribute to the large turnout of the tribal students at the primary and secondary levels. This is in accordance with the Government reports and census report 2011 where it was found that there is a

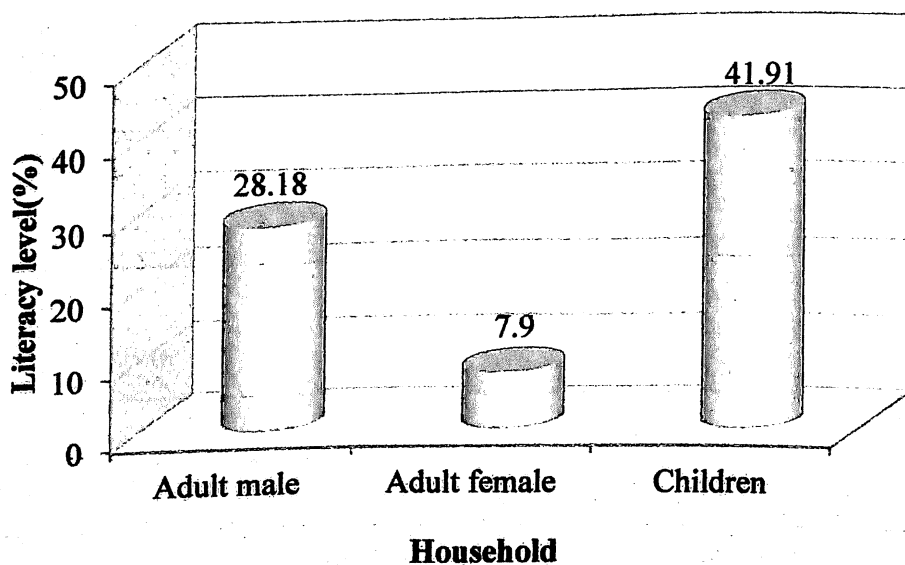


Figure 4.2 Literacy levels of the households

considerable increase in the literacy rates at the age level from 0-6. A substantial disparity in the literacy levels between males and females was observed which is mainly attributed to the negative attitude of girls' education in the state. This is in coherence with the report of the Ministry of Tribal Affairs, Govt. of India, 2014.

**Table 4.2: Socio-economic profiles of the respondents**

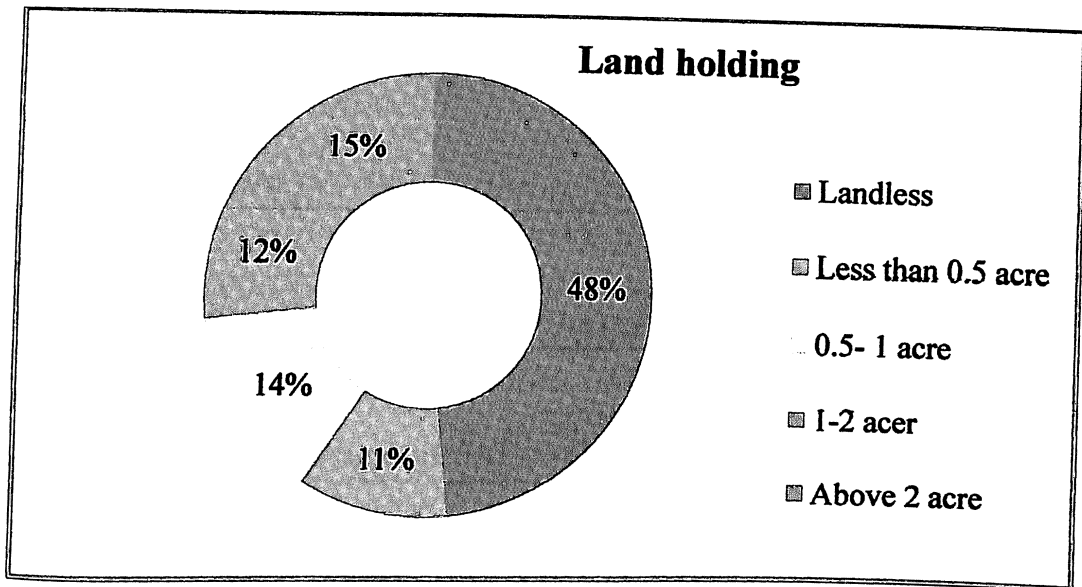
Sl. No.	Socio-economic characteristics	number	percent
<b>1</b>	<b>Size of the family (Average)</b>	5.42	-
	Adult male	1.91	-
	Adult female	1.51	-
	Children	2.77	-
<b>2</b>	<b>Age of the respondents</b>		
	18-40	43	35.83
	41-60	46	38.33
	61-80	31	25.83
<b>3</b>	<b>Literacy level of the households</b>		
	Adult male	62	28.18
	Adult female	14	07.90
	Children	114	41.91
<b>4</b>	<b>Size of the land holding</b>		
	Land less	58	48.34
	Less than 0.5 acre	13	10.83
	0.5-1 acre	17	14.17
	1-2 acre	14	11.66
	Above 2 acre	18	15.00
<b>5</b>	<b>Livestock (average)</b>	6.37	90.00
	Cow	2.63	52.50
	Buffalo	2.43	25.00
	Poultry	5.62	61.66
	Goat	2.32	54.16
	Piggery	1.59	75.00

#### 4.1.1.4 Land holding

Out of the total 120 Kutia Kondh households surveyed, almost half (48.34%) were found to be landless. 36.66% respondents had a very small size of land holding i.e. less than 2 acre. Only 15 % people had more than 2 acre land holding.

The result (as indicated in Fig 4.3) indicates that most of the Kutia Kondhs are primarily landless or possessed small or marginal holdings. Hence, they are very much

dependent on forest lands or encroached revenue lands for shifting cultivation or other economic activities.



**Figure 4.3 Size of the land holding of the respondents**

#### 4.1.1.5: Livestock

About 90% of the Kutia Kondh population owned livestock with on average 6.37 animals per household. They reared livestock for agricultural purposes. The forests nearby sustain these livestock. They also reared poultry. It was interesting to note that they did not consume or sell milk and milk products while they consumed egg and meat of the poultry and meat of goats and pigs and also sold them in the local market in times of cash shortages. Having animals was an economic security for them as was observed in many other studies (Kumar, 2015). Rearing of pigs is a common feature of Kutia Kondhs of this region.

#### 4.1.2: Involvement of Kutia Kondhs in different income generating sectors

The Kutia Kondhs meet their food and income needs from collection of NTFP, shifting cultivation, wage earning, agriculture, livestock rearing and services and allied activities.

Table 4.3 indicates that, all Kutia Kondhs are involved in NTFP collection. An average number of 2.6 people in each household are involved in this activity and is the most predominant income generating activity of the area surveyed. And most of them (96.66%) also practiced shifting cultivation. In addition, Kutia Kondhs are also

involved in livestock rearing (90%), daily wages (78.33%), agriculture in their own land or encroached land (43.33%) and services and allied activities (5.83%). Hence, collection of NTFP and shifting cultivation are the important activities in terms of labour contribution. Similar results on forest dependency were observed where the NTFP collection is one of the predominant activities of the forest dwellers (Mahapatra *et al.*, 2005). However in some other studies heavy dependency on agricultural labour (79.05%) was also observed (Singh *et al.*, 2010)

**Table 4.3: Percentage of sample respondents in different sectors**

Activities	Number of respondents(out of the people surveyed, the number involved in various activities)	Percentage	Average numbers of family members involved
NTFP collection	120	100	2.6
Shifting cultivation	116	96.66	1.7
Agriculture	52	43.33	1.3
Livestock rearing	108	90.00	1.1
Wage earning	94	78.33	1.55
Services and Allied activities	7	5.83	1.00

#### 4.1.3: Composition of employment

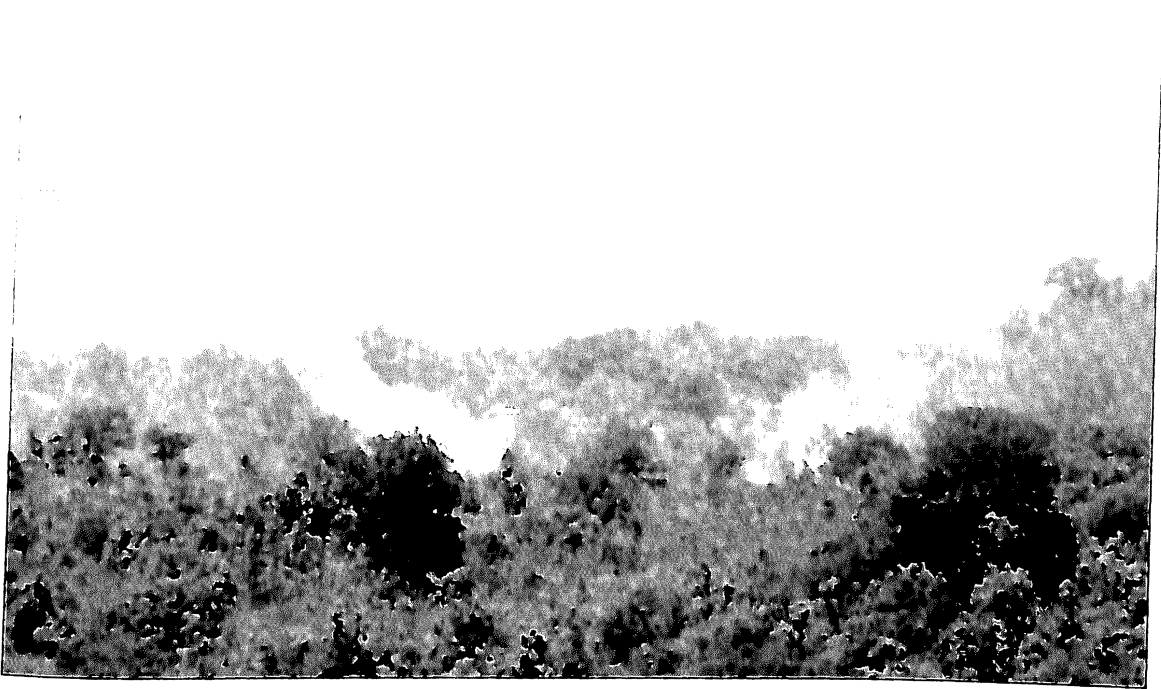
On comparing employment generation in various sectors, the daily wage sector generated the highest employment opportunities for the tribals, with respect to the number of mandays per household per year (35.40%) followed by NTFP (25.28%) (Table 4.4). This was similar to the results of Kumar (2015). He reported an average employment of 115.56 mandays/HH/year from wage sector and 77.81 mandays/HH/year from NTFP. In the present study, the agricultural sector contributed to 11.47%, livestock rearing 4.32% and services and allied activities 3.34% of the total number of mandays/HH/year. Studies indicate that NTFP and daily wages are the two major employment opportunities for the tribals. According to studies of Ravi *et al.*,

2006, NTFP contributed 50.58% (137.82 mandays /HH/year) which is more than those generated by wages that was 91.79 mandays/HH/year (33%).

The largest employment generator in the area surveyed is the wage sector .This is mainly because of the employment guarantee scheme of the Government viz., MGNREGS which ensures 100 mandays of work per household per year. 48.34% of the total population are landless and resort to agricultural labour during the time of cultivation and harvesting of agricultural crops or work as casual labourers for regular forestry activities. It was observed by Islam *et al.* (2014) that the direct employment generated from forest activities alone accounted to 19.82 mandays/HH/year in Jharkhand. Forest department engage the tribals as daily wage labourers for land preparation, nursery operation, planting, digging, development of soil and water conservation measures and other maintenance activities. This was supported by the results of Islam *et al.* (2014) and Tejaswi (2008). The MGNREGS is a large employment provider throughout the year and provide the rural population employment at INR.174/day as compared to local wages at INR.90/day.

Kutia Kondh people are traditionally hunters and gatherers and they are habitual collectors of NTFP, though it provided less employment opportunities than wage earnings. It was interesting to note that they preferred to work as labourers only in the lean seasons when NTFP was not available though the daily wages was much promising in terms of the returns than from NTFP.

After wage earning and NTFP collection, shifting cultivation is the next best employment provider which give around 20.19 % of employment generated. They practice shifting cultivation (*Podu chasa*) in forest lands and generally produce cash crops like turmeric, ginger, mustard, black gram, arrowroot etc. The dependency on shifting cultivation is a matter of concern as it is one of the causes of deforestation.



**Fig. 4.4 Slash burning for shifting cultivation**



**Fig. 4.5 Clearing of forest patch for shifting cultivation**

**Table 4.4: Composition of employment in different sectors**

Activities	Employment generated (days/HH/year)
NTFP collection	64.17 (25.28)
Shifting cultivation	51.27 (20.19)
Agriculture	29.12 (11.47)
Livestock rearing	10.97 (4.32)
Daily wages	89.86 (35.40)
Services and Allied activities	8.47 (3.34)
<b>Total</b>	<b>253.86</b> <b>(100)</b>

Note: Figures in parenthesis indicate percentage to total

#### **4.1.4: Contribution of income from different sources to average household income**

Income in the study area is generated from six major activities: NTFP, shifting cultivation, earnings from daily wages, agriculture, livestock rearing and services and allied activities as shown in Table 4.4. Wage earning generated the highest average annual income (INR.9222) accounting 37% to the total income (INR.24696) of Kutia Kondh people (Table 4.5).

The next important income source was NTFP contributing 28% (INR.7023) to the total income (Table 4.5). The income generated from NTFP in the present study is much lower than the annual income reported (INR.75032) by Singh *et al.*, 2010 from Mangrove forest areas of Sunderbans but are similar to the studies of Prakash *et al.* (2006) where an annual income of INR.5392.56 has been reported.

Shifting cultivation is also an important income source for Kutia Kondhs which constitutes around 19% of total income. They clear the forest land by burning it and there they grow various cash crops like turmeric, ginger, mustard, black gram, arrowroot etc. Besides these they also cultivate rice, cauliflower, reddish, potato, finger millet, corn etc. and some oil crops like sesame, castor etc.

**Table 4.5: Composition of average annual household income derived from different sectors (Household/year)**

<b>Activities</b>	<b>Income generated (INR/HH/year)</b>
NTFPs	7023.33 (28.43)
Shifting cultivation	4656.66 (18.86)
Agriculture	2260.00 (9.15)
Livestock rearing	317.50 (1.29)
Wage earning	9222.45 (37.34)
Services and Allied activities	1216.66 (4.93)
<b>Total</b>	<b>24696.625</b> <b>(100)</b>

Note: Figures in parenthesis indicate percentage to total

Other sectors, like agriculture, in their own lands accounted for 9% and services and allied activities 5% of total annual income. Agricultural production in the region is quite low because of the small land holdings, lack of irrigation, rain fed conditions and lack of technical knowhow. They mainly grow paddy, brinjal, tomato, potato, cauliflower, beans, cowpea etc. Because of the low production, most households grow crops primarily for home consumption only. Very small amount of these agricultural products are sold and hence, the contribution of agriculture to cash income was small.

Livestock contributed the least (1.29%) to the total annual income but led to a higher consumption of livestock products, especially meat and egg at the household level. The cattle owned by the households were being used solely for carrying out agricultural operations because Kutia Kondhs do not consume milk or milk products. However, the sale of goats and poultry contributed meagerly to the house hold income. Therefore NTFP income and wage earning were important sources of income to

households as is evident from their higher share percentage towards total household income (Table 4.5).

## **4.2: OBJECTIVE-2: TO ESTIMATE THE CONTRIBUTION OF NTFP TO THE TRIBAL INCOME.**

### **4.2.1: Major NTFP collected in the study area**

Table 4.6 depicts details on various NTFP collected, the period of availability of the NTFP, the economic parts, methods of collection and utilisation. NTFP like sal and siali leaves, hillbroom, harida, bahada, aonla and tamarind forms the major chunk of the collection whereas bhuinkakharu, bhunimba, honey and resin are collected in small amounts. Some NTFP like siali seeds, kandha (roots and tubers), brush stick, fuel wood etc. are collected strictly for home consumption.

A total of 12 NTFPs including fire wood were collected from the forests by the respondents all-round the year. Out of the 12 NTFPs, 8 NTFPs were collected almost the entire year. During October to January they collected harida, bahada, aonla and kandha. It's the daily practice of the Kutia Kondhs to set out into the forests as a group from the village early in the morning. They collect the forest produce (roots, tubers, wild fruits, hill broom etc.) including fire wood and return in the evening before sunset. Collection of NTFP in the study area is done both by men and women. Women go in groups to less distance areas especially for the firewood whereas men go to faraway places.

Collection of sal and siali leaves is one the most important among the NTFP. Each household collect sal leaves and silai leaves. The average annual collection of sal and siali leaves was 317 kg and 210 kg respectively (Table 4.8). The average selling price of sal leaves was INR.12.79 per kg and of siali leaves was INR.16.84 per kg (Table 4.9). As these were collected in a large amount and throughout the year, they contribute more than 50% to the total income.

The panicles of hill broom collected were around 26 kg per season per household on average and they sold an average of 23 kg to the local traders at an average price of INR.47.29 per kg (Table 4.9). Kutia Kondhs in the study area collected 45 kg and 35 kg of harida and bahada respectively per season and sold it to the local traders at an average price of INR.10 to 15 per kg. Aonla and tamarind are the

important fruits collected for home consumption and sale. The average collection of aonla and tamarind was around 26 kg and 30 kg respectively per season and they sold it at an average price of INR.47 per kg and INR.17 per kg respectively.

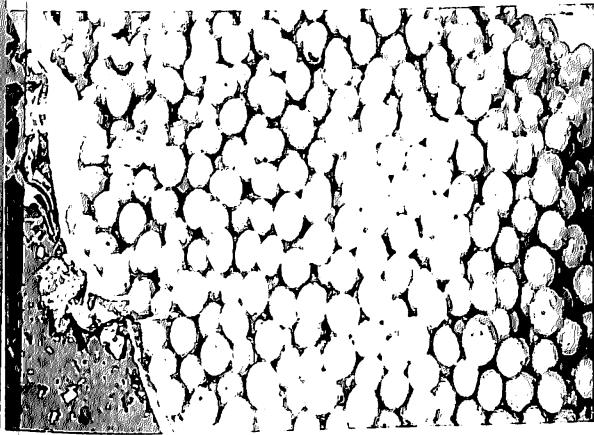
The two important medicinal plants that were collected by Kutia Kondhs from the forests are bhuinkakharu and bhunimba. These were collected in very small quantities. The average selling price of bhuinkakharu was INR.41 per kg whereas price of bhunimba was INR.46 per kg.

Other products collected in small quantities include resin and honey which was mainly for their home consumption. The extra amount which was left after the consumption was sold to the local traders. On selling resin and honey, they fetched an average price of INR.147 per kg and INR.180 per kg respectively.

Kandha (roots and tubers) were collected by the Kutia Kondhs from October to February from the forests and they preferred to use it more for their own consumption instead of selling in the local market. They love to eat 'kandha' (i.e. roots and tubers of different plants). The tubers collected fulfill most of their food and nutritional requirements. The same is true for siali seeds. On an average each household collected 300 kg of kandha and 120 kg of siali seed per season. They also collect firewood and brush stick from the forest for their own use and not for sale. Hence, these NTFP do not contribute to their annual household income.

**Table 4.6: Information on NTFPs in the study area**

Sl. No	Common name	Botanical name	Family	Parts used	Period of availability	Method of collection	End use
1	Sal	<i>Shorea robusta</i>	Dipterocarpaceae	Leaves	Round the year except March, April	Plucking	Sold to local agents for Plate making
				Toothstick	All season	Cutting	Brushing
				Resin	All season	Scrapping	Used for home consumption and sold
2	Siali	<i>Bauhinia vahlii</i>	Caesalpiaceae	Leaves	All season	Plucking	Sold to local agents for Plate making
				Seed	Feb-Apr	Dropping	Food
3	Honey	<i>Apis florea</i>	-	-	All season	Bee hive and smoker	Used for home consumption and sold
4	Hill broom	<i>Thysanolaena maxima</i>	Poaceae	Above ground part	Feb- May	Cutting	Broom making and sold to local agents
5	Harida	<i>Terminalia chebula</i>	Combretaceae	Fruit	Oct-Jan	Shaking and plucking	Sold to local agents
6	Bahada	<i>Terminalia belerica</i>	Combretaceae	Fruit	Oct-Jan	Shaking and plucking	Sold to local agents
7	Aonla	<i>Embilica officinalis</i>	Euphorbiaceae	Fruit	Oct-Feb	Shaking and plucking	Used for home consumption and sold
8	Tamarind	<i>Tamarindus indica</i>	Caesalpiaceae	Fruit	Mar-May	Shaking and plucking	Used for home consumption and sold
9	Kandha	-	Dioscoreaceae	Roots and tubers	Oct-Feb	Digging	Used for home consumption
10	Bhuinnimba	<i>Andrographis paniculata</i>	Acanthaceae	Whole plant	All season	Digging	Traditional uses as medicine and sold
11	Bhinkakharu	<i>Ipomea mauritiana</i>	Convolvulaceae	Tuber	All season	Digging	Traditional uses as medicine and sold
12	Firewood	-	-	Wood	All season	Cutting	Home consumption



**Aonla**



**Bahada**



**Sal and siali leaves**



**Harida**



**Hill broom**



**Beehives in the tree**

**Fig. 4.6 Different NTFPs in the study area**

#### 4.2.2: Employment Generated from Specific NTFP from the study area.

Sal and siali leaves were the major employment sources among the NTFP sold; contributing to 51% (33 days/HH/year) of the total employment generated by the NTFP (Table 4.7). This is because these are collected in large quantities and almost throughout the year. Hill broom was the next important employment generating activity which provided 8% (5 days/HH/year) to the total employment generated by the NTFP. Collection of bhuinkakharu and bhunimba together provided 12% (7 days/HH/year) employment opportunities. Honey and resin contributed least to the total NTFP mandays i.e. 3.94% and 2.85% respectively as these were collected in a very small quantity and were seasonal.

Table 4.7: Seasonal contribution of NTFPs and the employment generate

NTFPs	Season	Employment generated (days/HH/year)
Sal leaves	All season	19.81 (30.87)
Siali leaves	All season	13.12 (20.45)
Honey	All season	2.53 (3.94)
Resin	Mar-June	1.83 (2.85)
Hillbroom	Feb- May	5.44 (8.48)
Harida	Oct-Jan	4.16 (6.48)
Bahada	Oct-Jan	3.6 (5.61)
Aonla	Oct-Feb	3.31 (5.16)
Tamarind	Mar-May	2.82 (4.39)
Bhuinkakharu	All season	3.45 (5.38)
Bhunimba	All season	4.1 (6.39)
<b>Total</b>		<b>64.17</b> <b>(100)</b>

Note: Figures in parenthesis indicate percentage to total

The collection of harida, bahada, aonla and tamarind contributed 6.48%, 5.61%, 5.16% and 4.39% respectively to the total mandays generated from NTFP collection. The collection of these products generated only less than 5 days of employment for the Kutia Kondh people, presumably because of their simple collection procedures and the small quantities available for collection.

Thus, based on the employment generating capacity, sal & siali leaves and hill broom could be considered as the major income generating activity in terms of employment generated by NTFP in the study area. Altogether, the collection of all the available NTFP generated 64 days of employment per household. This is the same as the number of mandays generated observed by Prakash *et al.* (2006) for NTFP collection among some tribal groups in south India.

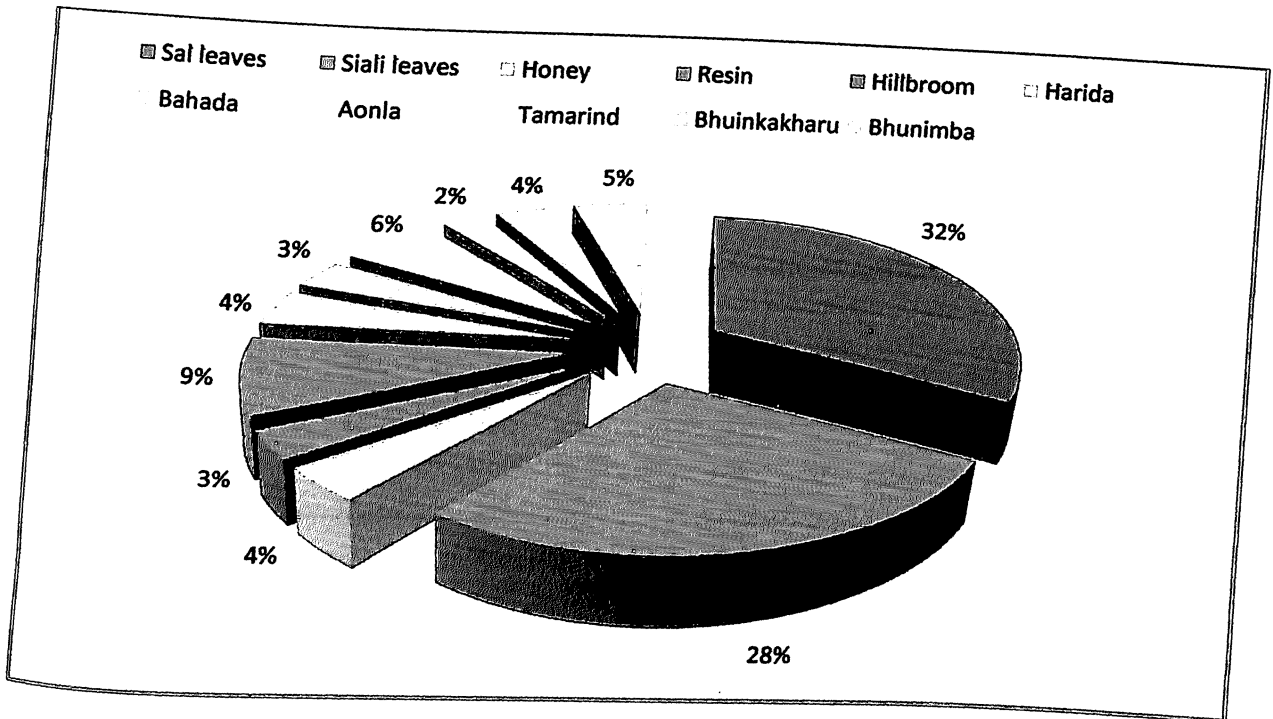
#### **4.2.3: Contribution of NTFP towards total cash income per household**

Kutia Kondhs collect eleven NTFPs excluding firewood. However, only few of these contribute significantly to the total household income. In the study area, sal and siali leaves accounted for around 60 % of total annual NTFP income (figure 4.8). It was found that after sal and siali leaves, the next important NTFP is hill broom which contributed to 9% of the total NTFP income followed by aonla (6%), bhunimba (5%). Honey, harida and bhuinkakharu contributed almost the same i.e. 4% each towards NTFP income. Same is the case for resin and bahada each of which contributed 3% towards NTFP income. Tamarind contributed the least (2%) to the total NTFP income.

The total income generated from NTFP per household per year added up to INR.12644.58. More time is spent for the collection of sal and siali leaves. The extended duration of collection of these products, large quantities available for collection, the predominance of these tree species in the nearby forest areas and the perpetual demand of these products in the market contributes to the higher income generated by sal and siali leaves in spite of the low prices of these products. Contrary to this in a study by Tejaswi (2008) it was noticed that Lichens which was available only for a span of 4 months contributed to 42.59% of the total NTFP income because of their high price per unit kg and the high demand for the commodity in the international market.

NTFPs	No. of HH involved /Year	Quantity collected (Kg/HH/Year)		Home consumption (Kg/HH/Year)		Quantity sold (Kg/HH/Year)		Income generated (INR/HH/Year)	
		Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D
Sal leaves	120 (100)	317.21	75.25	–	–	317.21	75.25	4047.58 (32.01)	1106.98
Siali leaves	120 (100)	210.08	78.62	–	–	210.08	78.62	3557.83 (28.14)	1468.28
Honey	48 (40)	4.63	0.76	1.81	0.733	2.81	0.89	502.29 (3.97)	155.61
Resin	56 (46.67)	4.76	0.99	1.98	0.77	2.78	1.05	409.28 (3.24)	154.62
Hillbroom	98 (81.67)	26.21	8.88	2.56	1.605	23.65	8.98	1101.55 (8.71)	403.36
Harida	84 (70)	45.39	3.47	–	–	45.39	3.47	505.07 (3.99)	57.38
Bahada	84 (70)	35.37	4.67	–	–	35.37	4.67	418.62 (3.31)	78.40
Aonla	76 (63.33)	26.28	8.15	11.09	3.08	15.19	8.35	723.11 (5.72)	398.38
Tamarind	62 (51.67)	30.70	6.26	11.85	2.77	18.85	6.72	325.88 (2.58)	126.31
Bhuinkakharu	32 (26.67)	11.41	7.89	–	–	11.41	7.89	469.75 (3.72)	340.93
Bhunimba	45 (37.5)	12.60	6.61	–	–	12.60	6.61	583.62 (4.61)	311.42
<b>Total (INR)</b>								<b>12644.58 (100)</b>	

Note: Figures in parenthesis indicate percentage to total



**Figure 4.5: Percentage income contributions from sale of different sources of NTFP**

#### 4.2.4. Net Returns generated from NTFP Collection.

The net returns generated from the NTFP collected by Kutia Kondhs were found out from the quantity collected and the price obtained per kg. The transportation cost was taken to be zero as the agents approached the respondents for collecting the NTFP. The labour input in NTFP extraction was considered and the opportunity cost was also calculated and deducted from the gross returns to find out the net returns (Svarrer & Olsen, 2008). Opportunity cost is the economic cost of an action or decision in terms of what is given up to carry out that action (USDA, 2012). In the present study, the opportunity cost was measured using the local labour wage of the tribal and the cost of time spent for NTFP collection. It was observed from the result that the highest net returns were obtained from siali leaves (INR.2356.94), sal leaves (INR. 274.21) and hill broom (INR.628.8). It was observed from the result that the opportunity cost was directly proportional to the net income in some of the products like sal leaves, siali leaves and resin. In tamarind, bhuinkakharu and bhunimba, it was found that the opportunity cost out more the net returns. It implies the high labour intensive collection process for these commodities. It was interesting to note that the net returns from honey (INR.278.1) almost

equaled the opportunity cost of labour of honey (INR.227.7). The result throws light on the fact that the tribals derive minimum benefits from all the products collected in spite of the fact that all the collection processes are labour intensive. The net returns per rupee cost was always more than one and ranged from 1.54 (honey) to a high of 177.81 (sal leaves). It is noteworthy that there is no cost involved in the collection process and nothing is paid by them. Had the labour been valued at the MGNREGS rate, the opportunity cost would be more than the NTFP income itself. The associated drudgery with collection is enormous. Still the Kutia Kondhs prefer to collect NTFP because of their liking and preference for their traditional way of living. Hence, considering their preference and low costs involved, the income generated from NTFP may be considered as the most important income source of the tribal households. The gross income in the study was estimated to be INR.12652.8. Similar results were observed in the study conducted by Shylajan and Mythili (2007). They showed a gross income per household of INR.9542 in the case of the Kattunaikkan tribal community.

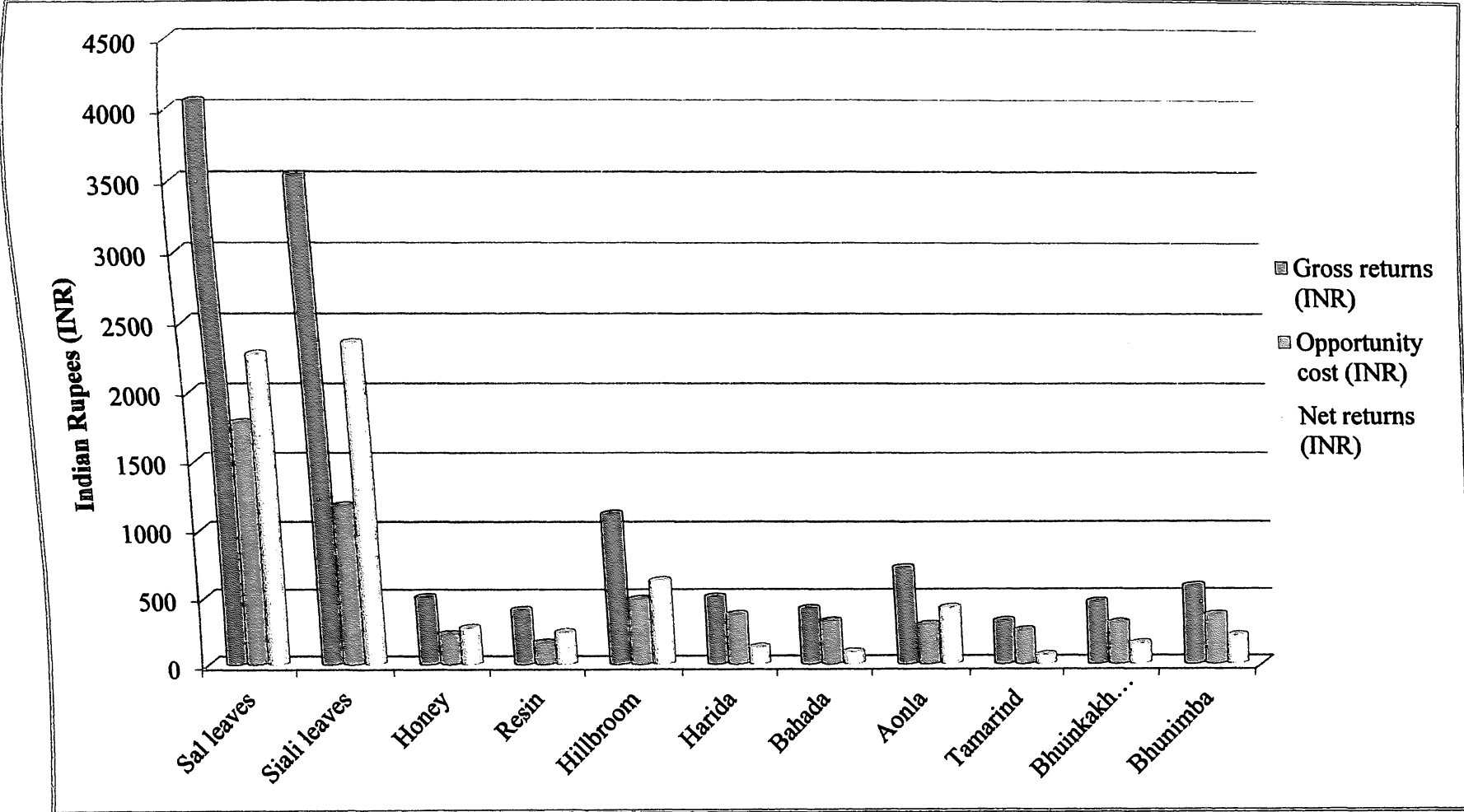


Figure 4.6: Economics of different NTFPs

**Table 4.9: Economics of NTFPs collectors (HH/year)**

Particulars of NTFP	Quantity sold (Kg)	Price/kg (INR/kg)	Gross returns (INR)	Transportation cost (INR)	Labour mandays	Opportunity cost of labour* (INR)	Net returns(INR)	Net return/kg	Net return/rupee cost
Sal leaves	317.21	12.79	4057.11	0	19.81	1782.9	2274.21	7.16	177.81
Siali leaves	210.08	16.84	3537.75	0	13.12	1180.8	2356.94	11.21	139.96
Honey	2.81	180.00	505.8	0	2.53	227.7	278.1	98.96	1.54
Resin	2.78	147.41	409.79	0	1.83	164.7	245.09	88.16	1.66
Hillbroom	23.65	47.29	1118.40	0	5.44	489.6	628.80	26.58	13.29
Harida	45.39	11.13	505.19	0	4.16	374.4	130.79	2.88	11.75
Bahada	35.37	11.84	418.78	0	3.60	324	94.78	2.67	8.00
Aonla	15.19	47.68	724.26	0	3.31	297.9	426.35	28.06	8.94
Tamarind	18.85	17.19	324.03	0	2.82	253.8	70.23	3.72	4.08
Bhuinkakharu	11.41	40.94	467.12	0	3.45	310.5	156.62	13.72	3.82
Bhunimba	12.60	46.40	584.64	0	4.10	369	215.64	17.11	4.65
<b>Total</b>			<b>12652.87</b>	<b>0</b>	<b>64.17</b>	<b>5775.3</b>	<b>6877.55</b>		

Note: \*Local wage rates were considered (INR 90 /Day)

#### **4.2.5: The relationship between the household characters of the tribals and percentage share of cash income generated from NTFP.**

Out of the ten independent household variables observed and analysed, four contributed significantly to the cash income generated from NTFP. The table (4.10) confirms that, total hours of collection with coefficient of 1.785 and family size with coefficient 1.887 were found to be significant at the 5 % and 1% level of significance respectively. This indicates a positive relationship between the total hours of collection and the share of the income generated from NTFP collection. Time spent or hours involved in collection positively contributed towards NTFP income because the more time spent the more is the quantity collected as expected. Similarly, the more the number of persons involved in collection per household, the more the household collection and income.

Shifting cultivation income (-2.565) and wage income (-2.214) were found to be negative contributors to the NTFP income. Shifting cultivation income was found to be statistically negatively significant at 99% confidence level whereas wage income was negatively significant at 95% confidence level. The result implies that if the time spent on shifting cultivation and wage income is more, then there is a considerable reduction in the income generated from the NTFP. An inverse relationship is clearly indicated between the incomes generated from the NTFP and income from wages and shifting cultivation. Information gathered from the secondary sources suggested that the Kutia Kondhs did not utilize the facility of employment guarantee schemes completely. They opted for wage labour only in times of dire necessity. Such observations indicate their preference for NTFP collection as a livelihood, even though the income generated from NTFP is low. It is also an indication that NTFP collection is not seen as a subsidiary source of income but as a major livelihood activity by the Kutia Kondhs.

The relationship between education with the coefficient of -2.629 and farm income with a coefficient of -4.016 and the share of household income of NTFP was negative but not significant. This is because of the fact that, the ever literate persons had no alternate source of employment or income. Similarly, the estimated coefficients for other variables such as distance travelled (2.027), age of the respondents (0.661), livestock income (1.296) and services and allied activities (-3.578) were found statistically non-significant. Thus it indicated that these variables did not have much

effect on share of income by NTFP. The income from services and allied activities was not significant because of the very small percentage of people involved. Migration of the people for job to other states was also less in case of respondents when compared to other communities in the region. The farm income is not significant because of the fact that most of the tribals rely on shifting cultivation and majority of them are landless. Hence, it can be concluded that determinants of share of household's income from NTFP are time spent for collection, the number of people involved in collection indicated by the family size, and income from other activities including wage income and income from shifting cultivation. Shylajan and Mythili (2007) in their studies have reported an inverse relationship between household income from non-wood forest products and income from cultivation indicating that households with more agricultural income depend less on NTFP. This is also in concurrence with Tejaswi's (2008) observation that the major determinant factors of NTFP income are time spent for collection and income from wages, farm and services and allied activities.

**Table 4.10: Share of household variables in cash income from NTFPs**

Independent variables	Coefficients (b)	Standard Error	t-value	Significance (p-value)
Constant	77.722	21.558	3.605	0.001
Respondents Age	0.661	1.489	0.444	0.661
Education	-2.629	4.130	-0.637	0.530
Distance travelled	2.027	2.689	0.754	0.458
Total hours of collection	1.785	0.866	2.062*	0.049
Family size	1.887	0.672	2.807**	0.009
Shifting cultivation income	-2.565	1.078	-2.380**	0.025
Wage income	-2.214	0.857	-2.583*	0.016
Farm income	-4.016	2.269	-1.77	0.088
Livestock income	1.296	2.474	0.524	0.605
Income from services and allied activities	-3.578	2.487	-1.439	0.162
Nr. of Observation	120			
Log likelihood	-291.86			
ANOVA best fit measure	0.428			
DECOMP based fit measure	0.517			

Note: \* indicate significant at 5% and \*\* indicate significant at 1%

### 4.3: OBJECTIVE-3: TO ANALYZE THE MAIN FACTORS AFFECTING THE TRIBAL LIVELIHOODS AND INCOME.

#### 4.3.1: Problems associated with the Livelihood of the Kutia Kondhs

The results of the study on the constraints indicate that the forest officers and the forest policies and regulations are favorable to the Kutia Kondhs. They did not express any displeasure over the forest department's policy on the collection of NTFP. The Kutia Kondhs inhabit the areas amidst the forests. Their response essentially reflects the decentralization of the NTFP collection and changes in the NTFP policy (1993) in the state. The present study also confirms that after the liberalization of collection of NTFP, the restriction on collection by the department has been negligible as evident from the respondent's response.

**Table 4.11: Respondent's opinion on problems by priority (Percentage)**

Respondents opinion	Implementation of Act	Communiting	Accessibility to food	Employment Scheme	Threats by forest officer	Restriction
1	14.7	7.1	10.1	22.1	54.8	70.9
2	0	9.3	52.4	15.7	22.3	14.7
3	46.7	56.8	2.2	3.2	6.5	5.2
4	0	12.6	31.7	48.8	12.9	7.4
5	38.6	14.2	3.6	10.2	3.5	1.8

**Note:**

1. Strongly disagree
2. Somewhat disagree
3. Undecided
4. Somewhat agree
5. Strongly agree

More than 50% of the population disagreed to the fact that there is an inadequacy of food. This could probably be because of the fact that they collect huge quantities of food from the forests. Kandha (rich source of carbohydrate) are collected in huge quantities by the Kutia Kondhs during the harvest season of kandha. Throughout the year they obtain

varieties of food stuffs from shifting cultivation and from the forests. These food stuffs also contribute to their food intake and nutritional requirement.

About 48.8% of them somewhat agreed that the employment scheme by the government is inadequate and meager. Contrary to this, the information gathered from the field also indicated that waged labour is not a primary choice of employment for the Kutia Kondhs.

Majority of the respondents were indecisive about the problems associated with the collection (46.7%) and commuting (56.8%). This indicates that they do not realize the problem or drudgery associated with the collection. This is because of the fact that NTFP collection is their traditional practice and routine that they hardly realize the hurdles and are ready to undergo any hardships for the activity they like to do. However, they opined about the risk of attack by elephants. The study also revealed that for majority of the Kutia Kondhs it was almost impossible to leave their customary practice of NTFP collection. It also served as safety nets providing them with food and some cash income during off seasons when most of the activities like agriculture and wage earning were nil. Paumgarten (2005), in his article states that NTFP are important to rural livelihood as a land use option and they fulfill important safety net function. Wunder *et al.* (2014) opined that forests provide both common safety nets to shocks and resources for gap filling. However, based on the general observations by the researcher during study period on the constraints of the forest based livelihood, it was found that the lack of transportation facility, the middlemen, labour intensive, nature of collection, low price per unit quantity, limited marketing facility, lack of co-operative society and lack of post-harvest practices of the NTFP collected contributed to the economic backwardness of the Kutia Kondhs. Similar factors were found to be impeding the tribal livelihoods in Jharkhand by Islam *et al.*, 2014.

#### **4.4: TESTING OF HYPOTHESIS**

The two hypotheses in the present study were

1. NTFP are the major and primary source of income for the tribals.
2. The characteristics of the population like the age, education, family sizes, other employment options influenced the NTFP collected by the tribals.

The first hypothesis regarding NTFP being the major and primary source of income for the Kutia Kondhs is accepted, as NTFP has a major role in generating employment and contributing income which accounts for 25% to the total employment and for about 28% of the total income of the households. Therefore, income and employment generated from NTFP are better than other sources of the income derived from agriculture, livestock rearing and services and allied activities. The major source of income and employment is daily wages, responsible for more than 35% of the total days of employment and 37% of total income of the households. However due weightage should be given to the observation that NTFP are their personal choices of livelihood.

Regarding the second hypothesis, the percentage share of income derived from NTFP gathered by tribal households was found to be influenced by the total hours of collection, family size, wage income and shifting cultivation income is accepted. Some factors (age, education, distance travelled, income from agriculture, livestock income and income from services and allied activities) were found to be non-influencing on share of NTFP income to the total household income.

## **CHAPTER-5**

---

### **SUMMARY & CONCLUSION**

## SUMMARY AND CONCLUSION

---

Forests worldwide generate substantial number of goods and services that benefit mankind. These values may be categorized as 1. Direct value use (values arising from consumptive and non-consumptive uses of forests like timber, fuel, extraction of other biological materials, tourism etc.) 2. Indirect value uses (values arising from various forest services like soil and water conservation, carbon sequestration etc.) 3. Option values (values reflecting a willingness to pay, to conserve the option of making use of a forest even though no current use is made of it) 4. Nonuse values also known as existence or passive use values (values that reflect a willingness to pay for the forest in a sustained use) (Pearce, 2001). Forests are a vital and significant sources of subsistence, employment and occupation, income and economy, food security, poverty alleviation, development and survival of the tribal people living in adjoining forest areas (FAO, 1989). Forests produce multitude of NTFPs like medicinal plants, dyes, mushrooms, fruits, resins, bark, roots and tubers, leaves, flowers, seeds, honey, lichens and so on. Despite their immense significance in the rural livelihood, there aren't any specific measures to sustainably harvest these products or standardize their prices or process these products so that the dependent population receives the maximum income from them. In addition, markets for these products are relatively unorganized and complex. Tribal people, who are often poor or landless are linked to the forests and forest produce. All of these factors contribute to the complexity of livelihood dependency on NTFP and their accurate estimation. With this background, the main thrust of the present study "Non Timber Forest Produce: A study on livelihood dependency of the tribal population (Kutia Kondh) of Kandhamal district, Odisha" is to assess the contribution of NTFP to income and employment for ensuring food and livelihood security to one of the Particularly Vulnerable Tribal Groups of Kandhamal District, the Kutia Kondh with the following specific objectives.

1. To conduct a simple livelihood survey in the area.
2. To estimate the contribution of NTFP to the tribal income.
3. To analyze the main factors affecting the tribal livelihoods and income.

For this purpose, the study was undertaken at Tumudibandh block of Balliguda subdivision of Kandhamal district of Odisha. Hundred and twenty Kutia Kondh people were sampled randomly from the four grama panchayats in Belghar region of Tumudibandh block and information were collected through structured questionnaire and personal interview. After analysis of the information, the key findings are presented below.

## **5.1: Key research findings**

### **5.1.1: Simple livelihood survey in the area**

- Socio-economic profile of the Kutia Kondhs reflected that average household size was very small (5.42) with on average 1.91, 1.51 and 2.77 of adult males, adult females and children respectively. It is because they prefer to live in nuclear family.
- The study on age group revealed that all age categories of people were involved in NTFP collection although the majority of respondents i.e. 38.33% were in the age group of 41 to 60 years.
- The literacy rate of adult males (28.18%) was much higher than adult females (07.90%). Literacy was highest for children (41.91%) because of tribal development programmes, free educational programmes and mid-day meal facilities of the Government.
- Almost half (48.34%) of the Kutia Kondhs were found to be landless. 36.66% respondents had a very small size of land holding i.e. less than 2 acre. Only 15 % people had more than 2 acre land holding.
- About 90% of the Kutia Kondh population owned livestock with on average 6.37 animals per household.
- Regarding involvement of Kutia Kondhs in different income generating sectors, they were mainly involved in six activities i.e. collection of NTFP, shifting cultivation, daily wages, agriculture, livestock rearing and services and allied activities.
- NTFP collection was the most important activity among Kutia Kondhs as all of them in the area were involved in this activity followed by shifting cultivation (96.66%), livestock rearing (90%), daily wages (78.33%), agriculture (43.33%) and services and allied activities (5.83%).

- The daily wage sector generated the highest employment opportunity, with respect to the number of mandays per household per year (35.40%) followed by NTFP (25.28%), and other sectors.
- Among the various sectors, average annual income generated from daily wages was highest (INR.9222) accounting 37% followed by NTFP contributing 28% (INR.7023) to the total average annual income (INR.24696) of Kutia Kondh people.

### **5.1.2: Contribution of NTFP to the tribal income.**

- A total of 12 NTFPs including fire wood were collected from the forests by the respondents all-round the year viz. sal and siali leaves, hill broom, harida, bahada, aonla, tamarind, bhuinkakharu and bhunimba, honey, resin and kandha.
- Among various NTFP, sal and siali leaves were collected annually in highest quantities i.e. 317 kg and 210 kg respectively but fetched very low price i.e. INR.12.79 and INR.16.84 per kg. Whereas honey and resin were collected in very small quantities i.e. 4.63 kg and 4.76 kg respectively but fetch more prices i.e. INR.180 and INR.147 per kg respectively.
- In terms of employment generated from various NTFP, sal and siali leaves formed the major portion contributing 51% (33 days/HH/year) of the total NTFP employment (64days/HH/year).
- The study on contribution of NTFP towards total household cash income revealed that sal and siali leaves together accounted for around 60 % (INR.7605) of total annual NTFP income (INR.12645).
- Sal and siali leaves also contributed highest (INR.4631) to the total average net returns generated from NTFP (INR.6878).
- Tobit model analysis revealed that the income from NTFP had a positive relationship with time spent for collection and the family size, while income from daily wages and shifting cultivation exerted a negative influence on the share of the NTFP income of Kutia Kondhs.

### **5.1.3: Main factors affecting the tribal livelihoods and income.**

- Majority of the respondents were indecisive about the problems related to implementation of act (46.7%) and commuting (56.8%).
- About 48.8% of them somewhat agreed that the employment scheme by the government was inadequate and meager.
- More than 50% of the population disagreed to the fact that there is an inadequacy of food.
- They did not express any restrictions imposed by the forest department to the collection of NTFP.
- The major constraints faced by the respondents were the drudgery associated with the collection of NTFP. The tribals inhabited isolated and remote areas of the district and lacked even the very basic facilities.

### **5.2: Conclusion**

To conclude, NTFP is an important source of employment and income for the PVTG, the Kutia Kondh. It is noteworthy that though NTFP contributes a lower proportion of total household income (about 28 %) than wage earning (37 %), it acted as safety nets in times of food scarcity and during off seasons where agricultural and wage income was nil. NTFP played a prominent role in both life and economy of Kutia Kondhs in the Kandhamal district. NTFP were collected for both subsistence and for sale for cash income. NTFP were found to be the second major employment and income generator as well. Thus NTFP collection is important and is very significant in the life of the Kutia Kondhs as they have a personal liking for collection of these products and consider it as their primary livelihood. Therefore, NTFP supplemented the households' income and ensured food security of the Kutia Kondhs.

## **Recommendations and suggestions of the study**

- ✓ The present study confirms that the NTFP are closely linked to the social, economic and cultural lifestyle of the people in the study area and eliminating them from their natural surroundings would not be acceptable. The fact also remains that because of these livelihood dependencies, the forest resources are also getting depleted as in case like shifting cultivation. There is an immediate requirement for the scientific management of the forest resources and their correct documentation.
- ✓ There is also a necessity of an organized collection and trade of these commodities which may be made instrumental by setting up of co-operative societies or collection and trade centers by the Government. This ensures proper documentation of the quantity, trade and economics of collection and also will help better income for the collectors.
- ✓ Some agroforestry models which include these NTFP species may be tried in the area itself as On Farm Trials. Natural resource based income activities like apiculture will also help them improve their livelihoods.
- ✓ The authorities should ensure that the benefits of the government schemes and policies reach such tribes which are residing in remote areas and improve their infrastructural facilities.
- ✓ Trainings on improved agricultural practices may be imparted to them and above all certain awareness programmes or information dissemination at the village level which will make them aware of the importance of forests, their sustainable use and impacts of human induced deforestation will help discourage the undesirable practices like shifting cultivation.

---

## **REFERENCES**

## REFERENCES

---

- Abeygunawardena P and Wikramasinghe A. 1992. An Economic evaluation of non-timber products of Hantana Forest. *In: Proceedings of Workshop on Methods for Social Science Research on Non-Timber Forest Products, May 18-20, Bangkok, Thailand.*
- Abwe MD, Ebia RN, Ewane DE, Mesue CA, Ntonifer Z, Nzohngandembou GW, Tangwa M, Vandorp A, Niemeijer and Offermans D. 1999. The wealth of forests in Cameroon. Limbe, Cameroon: CERUT and AID Environment. *In: ETFRN news 32 (ed.): NTFPs.*
- Acharya K. 2007. Environment-India: Tribals distressed by ban on forest gathering. *In: Inter press news agency.*
- Adam YO, Pretzsch J and Pettenella D. 2013. Contribution of Non-Timber Forest Products livelihood strategies to rural development in drylands of Sudan: Potentials and failures, *Agricultural Systems*, 117: 90–97.
- Ajaz-ul-Islam M, Quli SMS, Rai R and Sofi PA. 2013. Livelihood contributions of forest resources to the tribal communities of jharkhand, *Indian Journal of Fundamental and Applied Life Sciences*, 3(2): 131-144.
- Alibaba M, Subba rao DV and Vasudev N. 2000. Economics of minor forest products in Adilabad district (Andhra Pradesh), *Indian Journal of Agricultural Economics*, 55(3): 451-452.
- Angelsen A and Wunder S. 2003. Exploring the Forest — Poverty Link: Key Concepts, Issues and Research Implications. CIFOR, Bogor, Indonesia. pp. viii, 58p.
- Appaswamy and Paula P. 1992. Role of non-timber forest products in an interface forest project. *In: Proceedings of workshop on methods for social science research on NTFPs, May 18-20, Bangkok, Thailand.*
- Arnold J and Ruiz-Perez M. 2001. Can non-timber forest products match tropical forest conservation and development objectives?, *Ecological Economics*, 39: 437 – 447.

- Arnold JEM & Perez MR. 2001. Can non-timber forest products match tropical forest conservation and development objectives?, *Ecological Economics*, 39(3): 437-447.
- Babulo B, Muys B, Nega F, Tollens E, Nyssen J, Deckers J and Mathijs E. 2009. The economic contribution of forest resource use to rural livelihoods in Tigray, Northern Ethiopia, *Forest Policy and Economics*, 11: 109–117.
- Behera M. 2009. Non-timber forest products and tribal livelihood- a study from Kandhamal district of Orissa, *The Indian Forester*, 135: 1127-1134.
- Bhavannarayana C, Saritha V, Usha P and Rao PB. 2012. Dependency and usage pattern of forest-dwellers on non-timber forest products, *Erudite Journal of Ecology and Environmental*, 1(1): 1-5.
- Bussmann RW, Gilbreath GG, Solio J, Lutura M, Lutuluo R, Kunguru K, Wood N, Mathenge SG. 2006. Plant use of the Maasai of Sekenani Valley, Maasai Mara, Kenya, *Journal of Ethnobiology and Ethnomedicine*, 2: 22.
- Bussmann RW. 2006. Ethnobotany of the Samburu of Mt. Nyiru, South Turkana, Kenya, *Journal of Ethnobiology and Ethnomedicine*, 2: 35.
- Byron N and Arnold M. 1999. What futures for the people of the tropical forests?, *World development*, 27: 789 -805.
- Campbell JY. 1993. Putting the people's products first, non-timber forest products and the challenge of managing forest to enhance local income. *In: Proceedings of International seminar on MFP in forestry. 17-18th April, Dehradun, India.*
- Campbell MB and Luckert KME. 2002. *Uncovering the Hidden Harvest: Valuation Methods for Woodland and Forest Resources*, Earthscan Publications Ltd., London.
- Cavendish W. 2000. Empirical regularities in the poverty–environment relationship of rural households: evidence from Zimbabwe, *World Development*, 28: 1979–2003.
- Cavendish W. 2002. Quantitative methods for estimating the economic value of resource use to rural households. *Uncovering the Hidden Harvest: Valuation*

Methods for Woodland and Forest Resources, Earthscan publications Ltd., London.

Chakravarty and Verma R. 1991. Marketing of minor forest products in tribal sub-plan area through co-operatives in Rajasthan, *Indian Journal of Agricultural economics*, 71(282): 311-320.

Chandrashekar C. 1994. Non-wood forest products: A global view of potential and challenges. In: Proceedings of international seminar on management of minor forest products, 13-15 November, Dehradun, India.

Chileshe RA. 2005. Land Tenure and Rural Livelihoods in Zambia: Case Studies of Kamena and St. Joseph.

CIFOR. 2011. Forests and non-timber forest products. CIFOR fact sheets.

Cocks ML, Bangay L, Shackleton CM and Wiersum KF. 2008. 'Rich man poor man' — inter-household and community factors influencing the use of wild plant resources amongst rural households in South Africa, *International Journal Sustainable Devevelopment and World Ecology*, 15: 198–210.

Das B. 2005. Role of NTFPs among forest villagers in a protected area of West Bengal, *Journal of Human Ecology*, 18(2): 129 – 136.

Das SC. 1995. NTFP – a means of subsistence for forest fringe dwellers. In: Proceedings of seminar, March 8-9, 1995. In: Girish M. R. (ed.) 1998, PhD thesis.

Dattagupta S, Gupta A and Ghose M. 2010. Non-Timber Forest Products of the Inner Line Reserve Forest, Cachar, Assam, India: dependency and usage pattern of forest-dwellers, *Assam University Journal of Science & Technology: Biological and Environmental Sciences*, 6(1): 21-27.

Davidson-Hunt I, Duchesne L and Zasada J. 2001. Forest communities in the third millennium: Linking research, business and policy toward a sustainable non-timber forest product sector, Proceedings of meeting held October 1-4, 1999, Ontario, Canada.

- de Beer JH and McDermott MJ. 1996. The economic value of non-timber forest products in Southeast Asia (2nd ed.). Amsterdam: IUCN.
- de Merode E, Homewood K and Cowlshaw G. 2004. The value of bushmeat and other wild foods to rural households living in extreme poverty in Democratic Republic of Congo, *Biological Conservation*, **118**: 573–581.
- Emerton L. 2005. Making the economic links between biodiversity and poverty reduction: the case of Lao PDR. IUCN — The World Conservation Unit. Ecosystems and Livelihood Group Asia, Colombo.
- FAO. 1991. Non wood forest products: The way Ahead, Rome, Italy.
- FAO. 1992. Forest, trees and food, Rome. 2-4p. *In*: ODEBODE, Stella.O.– paper submitted to the XII world forestry congress,2003.
- FAO. 2005. The State of Food Insecurity in the World: Eradicating World Hunger Key to Achieving the Millennium Development Goals. Rome.
- FAO. 2006. Can Non Wood Forest Products Help Contribute to Achieving The Millennium Development Goals? Rome: 2-14.
- FAO. 2008. An Information Bulletin on Non-Wood Forest Products. Non-Wood News, Rome, **17**: 12-21.
- Gauraha AK. 1992. Micro-economic analysis of a tribal village, *Indian Journal of Agricultural Economics*, **47**(3): 446-447.
- Ghosal S. 2011. Importance of non-timber forest products in native household economy, *Journal of Geography and Regional Planning*, **4**(3): 159-168.
- Global NTFPs Partnership. 2005. *In*: Proceedings of the Inception Workshop held on 1-2 December 2005 at Marrakech, Morocco.
- Grimes A, Loomis S, Jahnige P, Burnham M and Mendelshon R. 1994. Valuing rain forest: The economic value of Non-Timber Forest products in Ecuador. *Ambio*, **23**(7): 405-410.

Hegde R and Enters T. 2000. Forest products and household economy: A case study from Mudumalai Wildlife Sanctuary, Southern India, *Environment Conservation*, 27: 250 – 259.

Hegde R. 1997. Role of forest in a forest fringe household economy: A case study from Madumalai Wildlife sanctuary, Southern India, Centre for International Forestry research, Jakarta, Indonesia.

Heubach K, Wittig R, Nuppenau EA and Hahn K. 2011. The economic importance of non-timber forest products (NTFPs) for livelihood maintenance of rural West African communities: A case study from northern Benin, *Ecological Economics*, 70: 1991–2001.

Intodia. 1990. Problems of tribals in Southern Rajasthan - A Case study. Department of extension education, Rajasthan College of agriculture, Rajasthan Agricultural University, Udaipur.

Islam MA, Sofi PA, Rai R and Quli SMS. 2014. Factors Influencing Forest Based Tribal Livelihoods in Jharkhand, *Trends in Bioscience*, 7(4): 238-242.

Kamanga P, Vedeld P and Sjaastad E. 2009. Forest incomes and rural livelihoods in Chiradzulu District, Malawi, *Ecological Economics*, 68: 613-624.

Kar SP and Jacobson MG. 2012. NTFP income contribution to household economy and related socio-economic factors: Lessons from Bangladesh, *Forest Policy and Economics*, 14: 136–142.

Kumar V. 2015. Impact of Non Timber Forest Produces (NTFPs) on Food and Livelihood Security: An Economic Study of Tribal Economy in Dang's District of Gujarat, India, *International Journal of Agriculture, Environment and Biotechnology*, 8(2): 387-404.

Mahapatra A. 1992. Forest dwellers dependence on forest –A case study of pauri bhuinya tribe of Orissa, *Journal of Rural development*, 11(6): 863-872.

Mahapatra AK, Albers HJ and Robinson EJZ. 2005. The impact of NTFP sale on rural households' cash income in India's dry deciduous forest, *Environmental Management*, 35: 258–265.

- Mamo G, Sjaastad E and Vedeld P. 2007. Economic dependence on forest resources: A case from Dendi District, Ethiopia, *Forest Policy and Economics*, **9**: 916-927.
- Melaku E, Ewnetu J and Teketay D. 2014. Non-timber forest products and household incomes in Bonga forest area, southwestern Ethiopia, *Journal of Forestry Research*, **25**(1): 215–223.
- Mishra M and Dash S. 2000. Biomass and energetics of non-timber forest resources in a cluster of tribal villages on the Eastern Ghats of Orissa, India, *Biomass and Bio energy*, **18**: 229 – 247.
- Mishra S. 2007. Household livelihood and coping mechanism during drought among Oraon Tribe of Sundargarh District of Orissa, *India Journal of Social Sciences*, **15**(2): 181-186.
- Mistry MD. 1992. The impact of the forest action on the household economy of the tribals. *In: The price of forests-proceedings of a seminar on the economics of the sustainable use of forest resources*, edited by Agarwal, Anil, CSE, New Delhi.
- Namdeo RK and Pant NC. 1994. Role of minor forest products in tribal economy, *Journal of Tropical Forestry*, **10** (1): 36-44.
- Nandkumar. 1988. A study on Impact of Integrated Tribal Development Project on Yerava Tribals in Virajpet taluk of Coorg district. M.Sc. (Agri.) Thesis, University of Agricultural Sciences, Bangalore.
- Neumann R and Hirsch E. 2000. Commercialisation of Non-Timber Forest Products: Review and Analysis of Research, Centre for International Forestry Research, Bogor, Indonesia.
- OATELP (Orissa Tribal Empowerment and Livelihoods Project). 2007. – A noble effort to address the livelihood issues of the Tribal people of the State.
- Panayotou T and Ashton P. 1992. Not by timber alone: Economics and Ecology for sustaining tropical forests, Washington D.C.: Island Press.

Pandit B and Thapa G. 2002. Non-timber forest products on marginal lands (Mimo), Asian Institute of Technology, Schools of Environment, Resource and development, Thailand.

Parvathamma C. 2004. Reservation: A pie in the sky, Development through education. Hunsur, Karnataka, India.

Paumgarten F. 2005. The Role of non-timber forest products as safety-nets: A review of evidence with a focus on South Africa, *Geo Journal*, 64(3): 189-197

Pervez MS. 2002. Role of non-timber forest products in the economy of dwelling households of Dhading district, Nepal: An Economic Analysis, M.Sc. thesis, University of Agricultural sciences, Bangalore.

Peters CM, Gentry AH and Mendelsohn RO. 1989. Valuation of an Amazonian rainforest, *Nature*, 339: 655-656.

Poffenberger M. 2006. The importance and potential of non-timber forest products in Asia, *In: Proceedings of the Non-Timber Forest Product (NTFP) Workshop and Seminar, Community Forestry International (CFI), December 2006.*

Prakash S, Prakash SS and Krishna VV. 2006. Participation behavior of indigenous people in extraction and marketing of Non Timber Forest Products in the dry deciduous forests of South India, *Journal of Tropical Forestry*, 22: 1-11.

Prasad NM. 1993. Evolving strategies for sustainable management and development of non-wood forest products. *In: Proceedings of the international seminar on MFP in forestry, 17-18th April, Dehradun, India.*

Prasad S and Eswarappa. 2005. Tribal livelihoods in a Limbo: Changing tribe nature relationships in South Asia presented in eighth sustainable development conference, Best western, Islamabad.

Rao A, Ratna and Singh BP. 1996. Non-wood Forest products contribution in tribal economy, *Indian Forester*, 122 (4): 337-342.

Raut RC, Sale DL and Nawadkar DS. 1992. Employment, income and expenditure pattern of tribals of Nasik District, *Indian Journal of Agricultural Economics*, 47(3): 415.

- Ravi PC, Mahadevaah GS and Muthamma MP. 2006. Livelihood dependency of Jenukuruba tribe of South India, *In: Proceedings of International association of agricultural economists conference, Gold Coast, Australia, August 12-18, 2006.*
- Reddy KN, Rao and Balaji NS. 2003. Technology, life and livelihood strategies of tribes of the Nilgiris: past, present and continuum, *In: Proceedings of interdisciplinary conference on "Livelihood strategies among forest-related tribal groups of South India" held at the Centre for Indian studies, Mysore, during October, 17-19, 2003.*
- Rout SD and Thatoi HN. 2009. Ethnomedicinal practices of Kol tribes in Similipal Biosphere Reserve, Orissa, India, *Ethnobotanical Leaflets*, **13**: 379-387.
- Rout SD, Panda SK, Mishra N and Panda T. 2010. Role of Tribals in Collection of Commercial Non-Timber Forest Products in Mayurbhanj District, Orissa, *Studies of Tribes and Tribals*, **8**(1): 21-25.
- Saha D and Sundariyal RC. 2011. Utilisation of non-timber forest products in humid tropics: implications for management and livelihood, *Forest Policy and Economics*, **14**: 28-40.
- Saha N. 1976. Population genetic studies in Kerala and the Nilgiris. *Human heredity*, **26**: 175-197, *In: Reddy and Rao (ed.) Technology, life and livelihood strategies of tribes of The Nilgiris: past, present and continuum, Mysore.*
- Sahani R and Nandy SK. 2013. Particularly Vulnerable Tribal Groups in India: An overview, *Journal of Anthropological Survey of India*, **62**(2): 851-865.
- Sawhney P and Engel S. 2003. Importance of Non-Timber Forest Produce for subsistence and income generation in the life of local people. Case of Bandhavgarh National Park, India. Centre for Development Research (ZEF), Walter-Flex-Str. 3, 53113 Bonn.
- Sekar C, Rai, Vinaya RS and Ramasamy C. 1996. Role of minor forest products in tribal economy of India: A case study, *Journal of Tropical forest Science*, **8**(3): 280-288.

- Shackleton C and Shackleton S. 2004. The importance of non-timber forest products in rural livelihood security and as safety nets: a review of evidence from South Africa, *South African Journal of Science*, **100**: 658-664.
- Shackleton CM, Shackleton SE, Buiten E and Bird N. 2007. The importance of dry woodlands and forests in rural livelihoods and poverty alleviation in South Africa, *Forest Policy and Economics*, **9**: 558–577.
- Sharma R and Arunachalam A. 2011. Contribution of non-timber forest products (NTFPs) to livelihood economy of the people living in forest fringes in changing districts of Arunachal Pradesh, India, *Indian journal of fundamental and applied life sciences*, **1**(2): 157-169.
- Shit PK and Pati CK. 2012. Non-Timber Forest Products for Livelihood Security of Tribal Communities: A Case Study in Paschim Medinipur District, West Bengal, *Journal of Human Ecology*, **40**(2): 149-156.
- Shylajan and Mythili. 2007. Community dependence on Non-timber forest products: A household analysis and its Implication for forest conservation. Indira Gandhi Institute of Development Research, Mumbai.
- Singh A and Sadangi BN. 2012. Livelihood Patterns and Resource Base of Tribals in Koraput and Rayagada District of Odisha, *Indian Research Journal of Extension Education Special Issue*, **1**: 307-312.
- Singh A, Bhattacharya P, Vyas P and Roy S. 2010. Contribution of NTFPs in the livelihood of mangrove forest dwellers of Sundarban, *Journal of Human Ecology*, **29**(3): 191-200.
- Subramanyam. 2003. Ecology, technology and resources management among the tribes of Eastern Ghats: An Anthropological study”. *In*: Proceedings of the conference “ Livelihood strategies among forest – related tribal groups of south India held at Mysore, October 17-19, 2003.
- Subramanyam. 2003. Tribes and ecology of Andhra Pradesh: An anthropological study, in the Science of Man in Service of Man. *In*: Proceedings of Livelihood strategies among forest – related tribal groups of south India held at Mysore, October 17-19.

- Sudarsen and Sumathi. 2003. State and the forest-related communities: Issues and paradigms of development, *In: Proceedings of the conference on Livelihood strategies among forest-related tribal groups of South India held at the Centre for Indian Studies, Mysore, October, 17-19, 2003.*
- Sunderland T, Besong S and Ayeni J. 2003. Distribution, Utilization, and Sustainability of Non-Timber Forest Products from Takamanda Forest Reserve, Cameroon, Smithsonian Institution/ MAB Biodiversity Program, Series 8.
- Sunderland TCH, Clark LE and Vantomme P. 1999. Non-Wood Forest Products of Central Africa: Current research issues and prospects for conservation and development, *In: Central African Regional Program for the Environment (CARPE), FAO, Rome.*
- Sunderlin W, Angelsen, Arild, Brian B, Burgers P, Nasi R, Santoso L and Wunder S. 2005. Livelihoods, Forests, and Conservation in Developing countries: An overview, *World Development*, 33(9): 1383 – 1402.
- Surayya T. 2000. Dependence of forest dwellers on fuel-wood and Non-Wood Products for their survival and pertinent marketing issues”, *In: Proceedings of international workshop on agro-forestry and forest products, November, 2000, NEHU, Aizwal, Mizoram, India.*
- Svarrer K and Olsen CS. 2008. The Economic Value of Non Timber Forest Products- A case study from Malaysia, *Journal of Sustainable Forestry*, 20(1): 17-41.
- Taylor FW and Parratt NT. 1995. The Potential of Non-Timber Forest Products of Botswana. *In: Proceedings of the Sixth Conference on the Australasian council on tree and nut crops inc. (ACOTANC-1995) Lismore, NSW, Australia, 11-15 September 1995.*
- Tejaswi. 2008. Non-Timber Forest Products (NTFPs) for Food and Livelihood Security: An Economic Study of Tribal Economy in Western Ghats of Karnataka, India, M.Sc. Thesis, Ghent University. Belgium.
- Thiagajrajan R. 1989. Integrated socio-economic and cultural transformation of a tribal community – A systems approach, Ph.D.Thesis, Tamil Nadu Agricultural University, Coimbatore.

- Timko JA, Waeber PO and Kozak RA. 2010. The socio-economic contribution of non-timber forest products to rural livelihoods in Sub-Saharan Africa: knowledge gaps and new directions, *International Forestry Review*, **12**: 284–294.
- Tiwari DD and Campbell JY. 1995. Developing and sustaining non-timber forest products: some policy issues and concerns with special reference to India, *Journal of Sustainable Forestry*, **31**(1): 53-77.
- Turner NJ. 2001. “Keeping it Living”: Applications and Relevance of Traditional Plant Management in British Columbia to Sustainable Harvesting of Non-timber Forest Products. United States department of agriculture forest service general technical report, **217**: 66-77.
- UNDP. 2004. The Equator Initiative: Money Grows on Trees. Cameroon Series 5, New York: UNDP.
- USDA. 2012. Sustainable management of non-timber forest products, Research, Education and Economics Information System.
- Vidyarthi AK and Gupta HS. 2002. Non-wood forest produce in village economy – A case study in Chota Nagpur region, *Indian Forester*, **128**(4): 371-378.
- Viet Quang D and Nam Anh T. 2006. Commercial collection of NTFPs and households living in or near the forests: case study in Que, Con Cuong and Ma, Tuong Duong, Nghe An, Vietnam, *Ecology Economics*, **60**: 65–74.
- Wagh VV, Jain AK and Kadel C. 2010. Role of non-timber forest products in the livelihood of tribal community of Jhabua district (M.P.), *Biological Forum — An International Journal*, **2**(1): 45-48.
- Wills, Russel M, Lipsey and Richard G. 1999. An economic strategy to develop Non-Timber Forest Products and Services in British Columbia. Forest Renewal BC Project No.PA97538-ORE. Final Report. *In: Integrating Non-Timber Forest Products into Forest Planning and Practices in British Columbia Forest practice Board, 2004.*
- Wollenberg E and Belcher B. 2001. *In: European Tropical Forest Reserach Network (ETFRN) news: 32.*

World Bank. 2000. World Bank reviews global forest strategy. *In*: News Release No. 2000/193/S.

Wunder S, Borner J, Shively G & Wyman M. 2014. Safety nets, gap filling and forests: A global-comparative perspective. *World Development*.

---

## **APPENDICES**

## APPENDICES

### Appendix I. Classification of Forest Types of Balliguda forest division

Forests of this Division were broadly classified into two major sub-groups. H.K.Mishra Plan adopted Champions and Seth classification in their Revised Survey of Forest Types in India 1962. These are described as follows

- (i) Northern Tropical moist deciduous
- (ii) Northern tropical Dry deciduous types.

Group: Moist Tropical Forests 3C Moist Deciduous Forests,  
3c/c2e Moist Peninsular Sal forest.

Forest Type 3c/c 2e Moist Peninsular Sal forests.

- Sub-type
- (i) 3c/c2e (i) Moist Peninsular High level Sal
  - (ii) 3c/c2e (ii) Moist Peninsular Low level Sal
  - (iii) 3c/c2e (iii) Moist Peninsular Valley Sal
  - (iv) 3/Dsl- Moist Sal Savannah

Edaphic types: (v) 3E/1 *Terminalia tomentosa* forests

Seral types (vi) 2s1 Dry bamboo brakes.

Sub-group 5B Northern Tropical Dry deciduous forests

- (vii) 5B/C1 Dry sal bearing forest
- (viii) 5B/C2 Northern dry mixed deciduous forests.

Degradation stage

- (ix) 5Ds 1 dry deciduous

(Source: collected from Balliguda forest division and given as such)

### Appendix II. 13 PVTGs of Odisha

Odisha	PVTGs Name	Odisha	PVTGs Name	Odisha	PVTGs Name
1	Birhor	6	Lanjia Sauras	11	Kharias
2	Bondo	7	Lodhas	12	Kutia Kondh
3	Didayi	8	Mankidias	13	Chuktia Bhunjia
4	Dongria-Khond	9	Paudi Bhuyans		
5	Juangs	10	Soura		

Source: Ministry of Tribal Affairs, Govt. of India

Appendix III. 62 Endogamous tribes of Odisha

Sl. No.	Name	Sl. No.	Name	Sl. No.	Name
1	Bagata	22	Gond, gondo	43	Lodha
2	Baiga	23	Ho	44	Madia
3	Banjara, Banjari	24	Holva	45	Mahali
4	Bathudi	25	Jatapu	46	Mankidi
5	Bhottada, Dhotada	26	Jung	47	Mankirdia
6	Bhuiya, Hbuyan	27	Kandha gauda	48	Matya
7	Bhumia	28	Kawar	49	Mirdhas
8	Bhumij	29	Kharia, Kharian	50	Munda, Munda Lahora, Munda Mahalis
9	Bhunjia	30	Kharwar	51	Mundari
10	binjhal	31	Khond, Kond, Kandha, Nanguli Kandha, Sitha Kendha	52	Omanatya
11	Binihia, Binjhoa	32	Kisan	53	Oraon
12	Birhor	33	Kol	54	Parenga
13	Bondo Poraja	34	Kolah Laharas, Kol Laharas	55	Paroja
14	Chenchu	35	Kolha	56	Pentia
15	Dal	36	Koli, Malhar	57	Rajuar
16	Desua Bhumij	37	Kondadora	58	Santal
17	Dharua	38	Kora	59	Saora, Sever, Saura, Sahara
18	Didayi	39	Korua	60	Shabar, Lodha
19	Gadaba	40	Kotia	61	Sounti
20	Gandia	41	Koya	62	Tharua
21	Ghara	42	Kulis		

Source: Ministry of Tribal Affairs, Govt. of India

**Appendix IV. Interview questionnaire**

**ORISSA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY  
UNIVERSITY (OUAT)  
COLLEGE OF FORESTRY  
Bhubaneswar-751003**

This information is gathered for the purpose of research work of the M.Sc programme of College of Forestry. A study is being conducted on the “Non Timber Forest Produce: A study on livelihood dependency of the tribal population (Kutia Kondh) of Kandhamal district, Odisha”. It is purely for educational purpose.

**I. General information**

Date: / /

District \_\_\_\_\_

Tehsil/ Block \_\_\_\_\_ Village \_\_\_\_\_

Investigator \_\_\_\_\_

Name of the respondent \_\_\_\_\_

Ethnic group/ tribe to which the respondent belong \_\_\_\_\_

**II. Family details:**

Sl. No.	Family members *	Sex	Age(Yrs)	Education(Yrs of schooling)#	Main Occupation**	Subsidiary occupation

\*1-Self, 2-Spouse of head, 3-Married child, 4-Spouse of married child, 5-Unmarried child, 6-Grand child, 7- Father- in-law, 8- Mother-in-law, 9- others (Specify)

\*\*1-Agriculture , 2- NTFP, 3 –Wage labour, 4- Private employee, 5- Govt. employee, 6- Business, 7- House wife, 8- Not working, 9- Student, 10- Others

#1- Masters, 2- Degree, 3- Pre University, 4- Secondary School, 5- Middle School, 6- Primary School, 7- Illiterate/Others

**III. Details of the land holdings:**

Type of Ownership	Rainfed (ha)	Irrigated (ha)	Subsidiary(ha)
Owned			
Leased in			
Leased out			
Land less4			
Grand Total			

Total Operational holding: owned land + leased land – leased out land:

\_\_\_\_\_

Lease Value: \_\_\_\_\_

Types of Soil: \_\_\_\_\_

**IV. Family Income (Include subsidiary occupation also):**

Family members	Occupation	Income (Rs.)	
		Monthly	Annual

**V. Time spent for the crop Production:**

Operations	Family Owned (Time spent(Hrs/day)				Hired (Time spent(Hrs/day)			
	Male	Female	Children	Bullock	Male	Female	Children	Bullock
Total time spent (hrs)								
Jan- March (avg)								
April- June (avg)								
July- September (avg)								
Oct- December								
Total (avg)								

**VI. Returns:**

Name of the product	Main products				By Products			
	Qty produced (Qtls)	Own consumption	Qty sold (Qtl)	Price /unit (INR)	Qty produced (Qtls)	Own consumption	Qty sold (Qtl)	Price /unit (INR)

Total income (Main products) \_\_\_\_\_

Total Income (By products) \_\_\_\_\_

**VII. Livestock Production and Income:**

Particulars	Number	Production (lts/kg)	Own consumption	Sale	Price/unit	Total income
Cow						
Goat						
Buffalo						
Poultry						
Others (specify)						

**VIII. Information on the NTFPs gathered from the forests:**

Particulars	1	2	3	4	5	6	7
Name of the NTFPs							
Plant parts (edible /non edible)							
Animal products (edible/non edible)							
Period of availability							
Peak season							
Lean season							
Nr. of hours of collection/day							
a. Male							
b. Female							

Qty. collected (Kg) (male) Jan-march April-June July-September Oct- Dec							
Qty. collected (kg) (Female) Jan-march April-June July-September Oct- Dec							
Distance travelled/trip a. Male b. Female							
Method of collection a. Male b. Female							
Cost of collection a. Male b. Female							
Qty. processed a. Male b. Female							
Cost of processing a. Male b. Female							
Home consumption a.Quantity b.Uses							
Sale of NTFP Quantity (kg)							
To whom sold							
Transportation cost (INR/trip)							
Price received (INR/kg)							
Total income from sales							
End use of the NTFP							

**IX. Respondents' opinion on the problems associated with NTFP collection and income generation:**

Problems according to priority by respondents	Priority basis (ranking)				
	1	2	3	4	5
Implementation of act					
Commuting					
Accessibility to food					
Employment scheme					
Threatens by forest officers					
Restriction					

Note: 1= strongly disagree, 2= somewhat disagree, 3= undecided, 4= somewhat agree  
5= strongly agree (higher the scale higher will be the importance)