Livelihood dependence and marketing of sal leaves in Sambalpur and Deogarh districts of Odisha.

By

Swagat Kumar Panda

Adm. No. 02FBM/16

DEPARTMENT OF FOREST BUSINESS MANAGEMENT

COLLEGE OF FORESTRY

ORISSA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

BHUBANESWAR-751003

2018

Livelihood dependence and marketing of sal leaves in Sambalpur and Deogarh districts of Odisha.

A

THESIS SUBMITTED TO THE ORISSA UNIVERSITY OF AGRICULTURE ANDTECHNOLOGY IN
PARTIAL FULFILMENT OF THE REQUIREMENT
FOR THE DEGREE OF MASTER OF SCIENCE
IN FORESTRY
(FOREST BUSINESS MANAGEMENT)

By

Swagat Kumar Panda

Adm. No. 02FBM/16

DEPARTMENT OF FOREST BUSINESS MANAGEMENT

COLLEGE OF FORESTRY

ORISSA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

BHUBANESWAR-751003

2018

ORISSA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY
DEPARTMENT OF FOREST BUSINESS MANAGEMENT
COLLEGE OF FORESTRY

Mr.Ranjan Kumar Kar
Assistant Professor,
College of Forestry,
Orissa University of Agriculture and Technology,
Bhubaneswar, 751003.

Bhubaneswar
Date:

CERTIFICATE I

This is to certify that the thesis entitled **"Livelihood dependence and marketing of sal leaves in Sambalpur and Deogarh districts of Odisha."**submitted inpartial fulfilment of the requirements for the award of the degree of **MASTER OF SCIENCE IN FORESTRY (FOREST BUSINESS MANAGEMENT)**to theOrissa University of Agriculture and Technology is a faithful record ofbonafide and original researchwork carried out by**Mr.Swagat Kumar Panda** 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 him/her from various sourcesduring the course of investigation has been duly acknowledged.

(**RANJAN KUMAR KAR)**
CHAIRMAN
ADVISORY COMMITTEE

CERTIFICATE II

This is to certify that the thesis **"Livelihood dependence and marketing of sal leaves in Sambalpur and Deogarh districts of Odisha."**submitted by **Mr.Swagat Kumar Panda** 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 BUSINESS MANAGEMENT)** has been approved/disapproved by the students advisory committee and the external examiner.

ADVISORY COMMITTEE

Chairman: **Mr.Ranjan Kumar Kar**
Assistant Professor,
College of Forestry,
Orissa University of Agriculture
and Technology,
Bhubaneswar,751003. _____

Members

1. **Dr. M.M. Hossain**
Professor Dean
College of Forestry
O.U.A.T., Bhubaneswar _____

2. **Mrs.Hiranmayee Nayak**
Assistant Professor
College Of Forestry
O.U.A.T., Bhubaneswar _____

External Examiner _____
(Name & Designation)

ACKNOWLEDGEMENT

At the very outset, I would like to express my sincere gratitude at the lotus feet of Sri Krishna, the supreme God for His kindness and love for all creatures of His divine creation. I am thankful to Him for providing me appropriate opportunities and circumstances in favour of successful completion of this research work. I would also like to thank my Parents for their blessing on me and for being there whenever I needed them the most.

I take this golden opportunity to express my heartfelt sense of gratitude to those who helped me to make my research possible. These words are mere acknowledgement but never fully recomposed for their great help and cooperation.

It is my esteemed privilege to place on record my deep sense of gratitude and indebtedness to **Mr**.**Ranjan Kumar Kar,** Assistant professor, College of Forestry, OUAT and chairman of advisory committee, for his wise counsel, constant guidance, healthy criticism, constant encouragement, persistent inspiration and positive contribution during the study. Without his support and good collaboration, this research work would probably not have seen the light and its implementation would have been much complicated.

I would also like to express my gratefulness to the member of my advisory committee, **Smt. Hiranmayee Nayak** for her scholastic guidance, constant encouragement, inspiring suggestion and untiring help during the period of my investigation and study.

I would like to express my gratitude and thanks to Dean College of Forestry, **Prof. M.M. Hossain** who has helped me in every part for successful completion of this research work, I am thankful to staff College of Forestry, OUAT, Bhubaneswar for their cooperation.

I am extremely indebted to staff members of Territorial **Forest Department of Sambalpur and Deogarh divisions** for assisting me in conducting research, sharing their useful information, materials and logistic support.

I feel highly grateful to each and every respondents of my study area for their immense cooperation beyond my expectation and for responding patiently and carefully to my interrogations.

I express my heartfelt thanks to my friends, colleagues, seniors and juniors for understanding me and helping me in crucial periods of research work and having a constant source of inspiration.

I would like to express my gratefulness and gratitude to my closest friend **SouravMeher**for assisting me like a shadow during my field works.

I express my thanks to RanjitBhai, who helped me for setting this manuscript giving a presentable shape and furnishing it timely.

Finally, I really appreciate you All. God richly bless you

Bhubaneswar **(Swagat Kumar Panda)**

Date :

CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS USED

%	Percentage
FAO	Food and Agriculture Organization
HH	Household
INR	Indian Rupee
JFM	Joint Forest Management
Kg	Kilogram
MFPs	Minor Forest Products
NGO	Non-Governmental Organization
NTFP	Non-Timber Forest Produce
NTFPs	Non-Timber Forest Products
OFDC	Orissa Forest Development Cooperation
SC	Scheduled Caste
SD	Standard Deviation
ST	Scheduled Tribe
VSS	VanaSurakhyaSamiti

ABSTRACT

*Shorearobusta*covers about 14% of Indian forest. From time immemorial, forest dwelling people of India belonging to the states of Odisha, West Bengal, Bihar, Madhya Pradesh, etc. rely extensively on sal trees as a substantial source of their livelihood. Collection and stitching of sal leaves is one of their traditional and indigenous vocation of the scheduled caste and schedule tribe communities of those fringe areas. The dominant role of sal leaves as trencher or eating plates (*patravali/ khali*) to contribute occupation of those disadvantaged classes is confronting contemporarily with threat of market insecurity and transformation of occupation. This is high time to quantify it's livelihood dependence and trade route to revitalize this low productivity low wage natural resource sector. Keeping this in view, 10 sal leaves collectors' villages of Sambalpur and Deogarh districts were studied to assess the quantum of livelihood dependence on sal leaves and find out the problems and limitations of their marketing.Villages were selected through purposive sampling out of 3 blocks of Sambalpur and 2 blocks of Debgarh districts. Households interview made based on random sampling with sampling intensity 20 to 30%. Primary data collection was made as per the interview schedule from the househiolds and secondary data collected from government reports. Data were subjected to statistical analysis (χ^2 and descriptive statistics) for valid conclusion. Literacy rate of over all study area was observed to be 67.28% but highest illiteracy was observed with Kansar (52%). Maximum people were of landless classes (38.64%) compared to marginal, small, medium and large farming classes. From the pooled data of 10 villages majority (29.58%) had agriculture as primary occupation. Primary occupation engaged maximum percentage of households (31.68%) for 150-200 days to generate annual income 0.5 to 1.0 lakh for maximum strength of people (28.53%). secondary occupation as NTFPs covers maximum households (44.24%) and engages maximum mass of people (38.90%) for less than 100 days and maximum percentage (27.5%) to earn annually Rs.10000-15000. Major NTFPs found were mahua, leaves of sal and kendu, firewood, edible shoots (karadi) and culms of bamboo, tamarind, siali, fodder, etc. Out of the averge annual earning from NTFPs () in the study area sal leaf contributes highest (64.7 lakh) among the villages in Naulipada. Lowest was with Dantari (13.9 lakh). Total number of man- days involved in this sector was highest with Naulipada (81120) and lowest with Dantari (17440). Nine types of trade routes were observed in the disposal of sal leaves for domestic and national markets. Among domestic routes longest one (sell of 23.33%) had 7 functionaries i.eprimary collection/ processing followed by marketing agent, contractor, big trader, whole seller, retailer and finally the consumer which accounts for the total market channels. The marketing channel holding maximum percentage (24.35%) of the total market channels is comparatively short and comprises of only 3 functionaries such as Primary collector/Processing unit,weeklyhaat and Consumer. The use of mechanised pressing unit is notably low. The issues identified and solution brought may be awareness programmes by government regarding their rights and concessions, establishment of mechanical processing units, promoting sal leaf products by spreading awareness among the masses, and adoption of proper method of value addition.

INTRODUCTION

India is one of the ten most forest-rich countries of the world comprising 23 percent of the total land area (76.962 m ha) out of which sal (*Shorea robusta* Gaertn f.) forests cover over 11 million ha (Gautam and Deove, 2005). From time immemorial human has been exploiting forest resources for his livelihood and sustenance. In Odisha, West Bengal, Bihar and Madhya Pradesh forest dwelling people rely extensively on sal forests as a source of additional income. They usually collect sal leaves in a daily basis and prepare khalis and donas or they sell raw leaves to agents and contractors, out of which various products (khalis, donas, trays, umbrella etc.) have been prepared in a separate processing unit.

Patravali or khali is an Indian eating plate or trencher made with broad dried leaves of various species of which majority is sal tree. It has been made to circular shape by stitching 6 to 8 sal leaves with tiny bamboo sticks. It is popular during traditional meals, festivals and in temples. It is a cottage industry in India where women work weave them at home in spare time. According to opinion of previous researchers, it was used extensively in the ancient times by Hindu sages for its purity. It was a custom to serve food in a patravali for guests or celebrations, temple prasadam (en.wikipedia.org/wiki/Patraval). The plates are popular in villages in arid region in India like parts of Andhra Pradesh, Uttar Pradesh, Maharashtra, Jharkhand, Odisha, West
Bengal, Karnataka, Telangana,Tamilnadu, etc.

1.1 Habitat, description and importance of sal trees

Shorea robusta Gaertn. covers about 14% of Indian forest. It is a large, deciduous, fire proof, tap rooted, drought resistant tree having clean, straight and cylindrical bole, spherical and spreading crown, brown and thick bark, epicormic branches, height 18-32 m and girth 1.5-2 m both may exceptionally reach up to 50 m and 5 m, respectively. Leaves simple, shiny, glabrous, about 10-25 cm long and broadly oval at the base, with the apex tapering into a long point and colour reddish to delicate green, yellowish-white racemose and self-incompatible, hermaphrodite flowers with high appearence or prelates to previous years drought, good seed at 3-5 years interval, dispersal by wind and water. Sal has habitat, altitude: 100-1500 m, temperature: minimum 1-7^{0}C maximum 34-47^{0}C, annual rainfall: 1000- 3000 mm with maximum upto max. 6600 mm and deep, well-drained, moist, slightly acid, sandy to clayey soils with most preferred sandy loam with good drainage. Depending on edaphic factors and microclimate, the phenology of sal forest ranges from deciduous to evergreen and extends from tropical to sub-tropical. Leaf fall usually starts in late winter (February) and is completed by the end of April (Misra, 1969). Sal regenerates from seed origin or by coppicing; sprouting from root suckers is also very common. Trees of both coppice and seed origin produce fertile seeds, and there is no difference in the vigour of the

seedlings from coppice or seed origin (Troup, 1986). Sal bears many economic importance, like dark, reddish brown, hard, very durable, strongly spiraled, termite resistant and heavy heartwood of specific gravity of 0.83-0.93 cm^3 used for household construction, hydraulic engineering, ships and railway cars, poles, railway ties and posts, interior finishing such as window frames and floors and many other applications. Seed has 10.8% water, 8% protein, 62.7% carbohydrate, 14.8% oil, 1.4% fibre and 2.3% ash; seed oil earns huge foreign exchange, its flour used as canned product (due to 50% starch present), edible bread called famine food, edible butter, and defatted kernel used as poultry and pig ration, leaf as fodder and host of tassar silk worm (*Anthera mylitta*) and leaves used for making leaf plates and cups because of pliable nature which becomes livelihood of many forest fringe households and source of foreign money.

1.2 Sal leaves policy and economy in Odisha

Sal leaf is one of the major sources of income for forest dwellers in Orissa more particularly in the districts of Mayurbhanj, Keonjhar, Kandhamal, Nayagarh, Sambalpur and Debgarh. It has of course become lease-barred item by the NTFPs policy of March 2000 which restricts commercial exploitation except provision of departmental harvesting; still the natural sal forest became a victim of occasional unsustainable exploitation. As there is no government policy to market sal leaves, tribals stitching plates and other items of the minor forest produce are being exploited by middlemen in the districts. Middlemen buy plates and cups made of sal leaves at a low price from collectors and sell it to earn huge profit, while tribals, particularly women struggle to sustain their families from the meagre amount. Sources reveal that the tribals engaged for over six months a year for collecting sal leaves and making ‘khali’ and ‘chaupati’ (Indian Express, 2018). Earlier, leaf plates were exempted from Value Added Tax or exercise tax in Odisha; only a royalty of Rs 72 per quintal of leaves was to be given to the forest department. But since July 1, 2017 these products were subjected to Goods and Sercvices Tax at 18%, which had put a negative impact on its trade ultimately imposing a load on the primary collectors.

1.3 Livelihood dependence on forest in Sambalpur and Deogarh districts

The forests of Sambalpur and Deogarh districts lie in the northern tropical zone and far away from the sea with a rainfall averaging about 1500 mm per year. This zone falls under northern tropical moist deciduous zone, but due to prolonged dry season with a short monsoon period, poor moisture retention capacity of soils, low relative humidity and regular fire, large areas support dry forests. Two broad forest types occurring according to

the revised classification of Champion and Seth are: (i) 3C North Indian Tropical Moist Deciduous Forests and (ii) 5 B Northern Tropical Dry Deciduous Forests. In general, on the eastern side of Mahanadi, forest areas have preponderance of Sal and on the western side the crop is miscellaneous in nature. Moist sal occurs in moist pockets in valleys and nallah banks and lower slopes of hills. Dry Sal occurs in the rest of the area. Having large extent of dense forests in both of the districts, People depend extensively on forest resources for their livelihood and sustenance. The magnitude of relationship between sal leaf availability and its dependence on livelihood of forest fringe communities with the changing market and consumers tastes preferences scenario and have not been quantified for the forest rich and potential districts of Sambalpur and Deogarh districts. Keeping these in view, present research entitled "Livelihood dependence and marketing of sal leaves in Sambalpur and Deogarh district of Odisha." has been formulated to enumerate sal leaf , tribal livelihood and market relation for both the districts with the following objectives.

1.4 Objectives of the study:

1. To enumerate quantity and period of availability of sal leaves and their dynamics on income and employment generation in Sambalpur and Deogarh districts of Odisha.
2. To study the existing market scenario and identify the structural and functional barriers of marketing of sal leaves of Sambalpur and Deogarh districts of odisha.
3. To address the issues, work out the possible solutions and suggest a comprehensive action points in strengthening marketing of sal leaves in Sambalpur and Deogarh districts of Odisha.

REVIEW OF LITERATURE

Researches relating to livelihood dependence and marketing of sal leaves are very much meager. However, systematic efforts has been made to present the brief findings of researches related to livelihood dependence and market of sal leaf or allied species and policy issues regarding transaction of NTFPs have been systematically presented here under the following headings.

2.1 Livelihood Dependence

Suri (1968) revealed that total foliage in trees and stands is vital for several purposes in forest management. A regression equation for diameter and total foliage of trees has been developed By actually counting the total number of leaves and measuring the diameter at breast height of individual sal trees.total quantity of foliage in unit area have been computed Using this equation and yield table figures.

Nandakumar (1988) revealed that the mean annual income of the tribes Yerava was INR.4400 per annum among 62 % of the respondents, while 38 % of them belonged to high income group with INR. 8850 per annum. A study by Thiagarajan (1989) also revealed that 75.5 % of the households of tribal had low income while the rest 24.5 % of them had sound income. Hence the economic status of tribals was much below the satisfactory level as 77.87 % of them were having their annual family income less than INR.

Jodha (1990) had a study about the use of CPRS (including NTFPs) in 21 districts in seven states in the dry tropical region of India. He surveyed a stratified random sample based CPR use for three categories of wealt viz. landless labourers and small farmers; larger farmers; and medium farmer. He observed that ranging from from 84% to 100% of the poorest group gathered NTFPs and other CPRS, compared to only 10% to 28% of the wealthiest group. He also revealed that the poorer households engage in collection and disposal of NTFPs because of low opportunity costs.

Appaswamy (1992) observed that in the Palani hills of Tamil Nadu, majority of NTFPs collectors were males. He also studied that a significant proportion of NTFPs collected was used for income generation rather than for home consumption and about fifty per cent of firewood was used for home consumption and the rest for Sale.

Gauraha (1992) revealed that, about 70 % of household income was obtained by the Forest dwellers from settled cultivation and sale of NTFP in Pendra block in Bilaspur district of Madhya Pradesh.

Naidu (1992) depicted that shifting cultivation was prevalent in Chintapalli tribal mandal in Visakhapatanam district of Andhra Pradesh. Shifting cultivation was practiced on two hecters of land on an average by Every farming family in the village. Further, it was also observed that the women were actively involved in decision making and therefore any programme meant for tribal welfare suggested to be oriented towards women.

Rao and Prasad (1992) studied the income and employment pattern of forest dwellers in the three different ecological and economic settings in Andhra Pradesh. Resource endowment was found to have a definite bearing on the employment pattern. Among Araku tribes, Position of the land and its cultivation had generated more days of employment whereas its absence forced the tribals in Nallamalai for collection of forest produce for their livlihood.

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

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

Chopra (1993**)** examined about the estimation of the value of NTFPs in India. He found that the value of NTFPs was higher than that of sustainable timber yield. The latter was valued at about 63.53 per cent of the former. According to him in case of NTFPs, the exchange value approximated by market price can be used as a measure of value.

Grimes *et al.*(1994) revealed that NTFP would contribute 77 % to the annual net returns, if dry deciduous forests are sustainably exploited. The present value of the

NTFPs on an average would be US $ 1182 per hectare, which is, however much less than that compared to similar estimation made for Ecuador where it was US $ 2830.

Namdeo and Pant (1994) revealed 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 Kerrya was about 6000 tons and creation of 600000 man-days of work at the rate of 10 kg per person per day.

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

Palit (1995) had a research on the role of NTFP in JFM revealed that each household of Raigarh forest protection committee was engaged for 63 days per year in the collection of NTFP on an average. About Rs. 2421 per household was the income earned from the sale of NTFPs.

Pérez (1995) had a study about commodity, income, market people's perceptions and traditional, household needs; and biological properties , sustainable management focus to strengthen forest based livelihood dependence etc.

Pradhan, 1995 studied the collection of various NTFPs in Keonjhar district of Odisha. The study revealed that sal seeds were collected by men, women and children. Sal leaves were predominately collected by women while tassar and weed for building materials were by men. With regards to all other NTFPs collected in the region, the collectors were predominately women and children.

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

Olawoye (1996) stated that rural households spent income realized from NTFPs for buying food to maintain their families. This provided a supplement to the economic status in the lives of the generality of the rural dwellers. Therefore dependence upon several combined and seasonal activities is an vital way to ensure household food security.

Ganapathy (1998) had a study on the role of NTFPs in the tribal economy of Kollegaltaluk of Karnataka. He covered four forest range of Kollegaltaluk such as Hanur, Kollegal, Malai Mahadeshwara Hills (M. M. Hills) and Rampuram. He reported most employment (42.96%) was generated by NTFPs for the tribals' households followed by farm employment (22.06%), allied employment (12.72%), wage employment (11.86%) and other source of employment (10.40%).

Shankar *et el*. (1998) had a study on The role of Non-Timber Forest Products in the tribal economy of B.R.Hills of Karnataka .He revealed that NTFPs generate the maximum employment (42.96%) for the tribal households followed by farm employment (22.06%) allied employment (12.72%), Wage employment (11.86%) and employments (10.40%). The analysis of the composition of income of the tribal households revealed that NTFPs were the main income generator, which contributed about 34.09 per cent of the total income of the households.

Abwet *et al*. (1999) reported that the total value of NTFP production and marketing exceeded US $19 million in the South-West and North-West provinces of Cameroon.

Alibaba *et al*.(2000) studied the income and labour relationships in collection of minor forest products. Heshowedthat labour spent on gum and tamarind collection was significant in generating income by tribals in forest areas. Their studied that most of the tribal households faced troubles in searching minor forest products due to danger of wild animals. Furthermore there required a controlled exploitation of minor forest products in order to give scope for rejuvenation of forests.

Neumann (2000) narrated about Commercialisation of NTFP. He studied about Socio-Political Aspects of NTFP Commercialisation, Land and Resource Tenure. He threw light on the effects of NTFP commercialisation on current customary tenure

systems. Women are most times the primary harvesters, processors and marketes of NTFPs from tropical forests. The labour for various activities involved in extracting NTFPs from the forest to the market is commonly divided between genders, though not in an easily generalizable pattern.

Panigrahy, R (2001) States that NTFP collection was a major economic activity for the households below poverty line in her study area i.e. Bolangir and Nuapada districts of Odisha. In income generation from NTFPs women's role is more compared to men as women do most of the NTFP collection. She also observed that for the most disadvantaged sections like widows' and old people's income from NTFP collection is very often the only significant income source.

Wollenberg *et.al.*(2001) studied that NTFPs play an vital 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.

Michell *et.al* (2003) had a study on the availability, production, consumption, management, and marketing of Non timber forest product in eastern India. He revealed that Odisha receives an annual Forest revenue of RS 1000 million, which constitutes the major revenue for the area.

Mitchell *et.al* (2003) studied the employment opportunities to the local tribals. In the tribal belt of the country about 70 % of the NTFP collection in India takes place. It would be known from the literature that the NTFP based small scale enterprises provide up to 50 % of income for 20 to 30 % of the rural labour force. Whereas 55 % of employment in forestry sector is attributed to the sector alone (Joshi, 2003). Hence collection of NTFPs was a major source of income and employment for forest dwellers.

Saxena, 2003 stated that the State agencies entrusted with the objective of giving a 'fair' price to NTFP gatherers exploited the poor and their interests was relegated to the third level. He found that the share of government royalty in total sales has generally been around 40%, although year to year fluctuations have been wild due to uncertainties in production. The share of total payment to labour in the gross annual sales was about 11–14% between 1973 and 1989, 25–30% in the late 1990s. However, about 30 to 40% of payment is to fictitious workers and is pocketed by the forest staff.

Subramanyam (2003) studied the non-tribal private traders buy the minor forest produce items from the tribals at low price and false weights and measures.

Sudarsen and Sumathi (2003) revealed that Malayali schedule tribe of Tamil Nadu mostly rely on the forest for their livelihood. 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 With the increasing strictures on access to the forest resources and changes in the policies created by government departments. The impact of external agencies like non-tribal moneylenders, traders, extremist's and their activities creating unrests among the interior tribals result into disturbances in their livelihood.

Arun(2004) studied about Extraction of NTFPs from the Community Forest. His study reveals the value of Non-Timber Forest Products (NTFPs) collected from the community forests and their distributional pattern based on economic categories of households. Findings show that value of NTFPs is higher than that of other forest products like timber and the gross value of NTFPs is higher in economically sound household than poor.

Patel (2004) observed that the approx. Daily production of bidi in western Orissa was around 60 lakh 50 years ago, whereas the current production(daily) is more than 1 crore. while 50 years ago about 50-60% of the bidi produced in the state was consumed within the state itself, currently the consumption is about 10% only, rest of the production being sold outside.He suggested that the daily sale of bidi in Orissa may be between 30-40 lakh pieces of which more or less 70% comes from other states.

Gautam and devoe (2005) ovserved that Sal forest is the forest type which is most affected by development programmes, such as resettlement and developmental infrastructure expansion programmes. People living in and around the sal forests also heavily depend upon the NTFPs from these forests. He further suggests that Sal forests should be managed now for multiple products, and not only for timber purpose by evolving silvicultural regimes. Foresters must now increase productivity (in quality and quantity) through silviculture that is sustainable and protects sal forest biodiversity.

Giri *et al.*(2005) studied that the collector of NTFPs gets a small fraction of surplus realised by produce sold in the market. The middlemen receive most of the benefit from marketing of surplus NTFPs. There is an urgent need for policy intervention to ensure maximum returns to local people.

Khatri-Chhetri (2006) in their study found that, the most significant NTFP are fodder, grass, leaf-litter and fuel wood, among all NTFPs extracted from common

forests. Fodder, grass and leaf-litter Though do not provide direct cash income play a vital role in the farming system. Commercial viability of NTFPs depends on prices at which these are sold.

Tamang (2008) had a study on the role of Network Marketing In Non-Timber Forest Products (NTFPs) in Nepal. She found that the demand of NTFPs of EMI HU is increasing annually by 337.98% and the selling trends of herbal product of EMI is 248.21%. Hence she concluded that Network Marketing istaking lead in the promotion of NTFPs by exploring markets, cultivation, and quality upgrade by processing.

Behera(2009) revealed that Orissa is one of the most backward states of India having 47 per cent of the population below poverty line. Forests constitute 37 per cent of the state's geographical area and are the major source of income for the poor in general and tribals in particular. For most of the tribal households, essential food and nutrition, medicine, fodder, fuel, thatch and construction materials and non-farm income are provided by forests. He opined these products are particularly important in relieving the 'hunger periods' during lean periods of agricultural cycle. Tribal households earned approximately 23 per cent of their total income from NTFPs resources from the forest areas.

Xayvongsa *et.al (*2009) opined that about 83% of the total population of Lao PDR lived in rural areas. People living near forest were mostly relied on the forest resources closed to their villages. 708 edible NTFP species had been reported so far of much about 400 plants have been reported and used as medicinal plants by Lao people.

Ahenkan and Boon (2010) critically analized Ghana's forestry policies and their impacts on NTFPs utilisation, development and management in the country by application of sustainability frameworks and SWOT analysis. They concluded that the lack of definite policy on NTFPs has impacted negatively on their promotion

Rout *et al.* (2010) examined the role of tribals in the collection of Non-Timber Forest Products in Mayurbhanj district of Odisha. They observed that the NTFPs collection contributed to the economy benefits significantly in everyday life of the tribal community, where the basic needs and livelihood earnings are significantly

supported from collection and processing of these items. The NTFPs provided much employment opportunities to the local tribal people.

Bhat and Tiwari (2011) analyzed that Indigenous knowledge plays an vital role in sustainable development, being planned by scientists and planners endevouring for tribal development. They studied indigenous knowledge and its practical use in utilization, conservation and management of natural resources among aboriginal populations like Gond, Baiga, Kanwar, Uraon, Bharia and Pahadikorwa of Chattissgarh particularly in Achanakmar-Amarkantak Biosphere Reserve. He revealed that there is an urgent need to document the surviving indigenous knowledge of these deserted groups before it is totally lost and also to evaluate its value for bio-diversity conservation. Indigenous knowledge also may contribute to improved development strategies in several ways such as by helping identify cost-effective and sustainable mechanisms for poverty alleviation that are locally manageable and meaningful; bringing better understanding of the complexities of sustainable development in its ecological and social diversity; and could help to identify innovative pathways for sustainable human development which could enhance local communities and their environments.

Ghosal (2011) Studied that Sal leaf is collected almost throughout the year by the local people of his study area (Purulia, Bankura and West Midnapur districts of West Bengal, India.) and the quantity of collected material varies from 24000 to 100000 plates per annum . The monetary value of the product varies from Rs 50 to 70 per 1000 plates in different sample areas.

Ministry of panchayati raj, government of india, New Delhi (2011) explained about ownership, price fixation, value addition and marketing of minor forest produce(MFP). It found that estimated production potential of NTFP is 3777.00 crores and estimated collection potential is 1900 crores.

Behera and Nath (2012) had a research about Financial valuation of NTFP flow from tropical dry deciduous forests in Boudh district, Orissa.They found that Forest occupies 40.5 per cent of the district's geographical area. Its floristic composition is very rich and diverse Being located in the Eastern Ghats. They observed that area harboured 187 plant species of which 85 plant species were being exploited for various purposes. Maximum number of species was collected for traditional health care (34.15%) and domestic use (31.71%). About 78 per cent people in hilly areas and 45

per cent people in plains remained engaged in this work for 3-6 months in a year for their livelihood. The average annual income of a family living in hilly areas was Rs. 19,349 of which NTFPs contributed 23.19 per cent (Rs. 4,487). Similarly 11.02 per cent (Rs. 2,258) was shared to the average annual income (Rs. 20,489) of a family residing in plain areas.

Shit *et al.* (2012) narrated about NTFPs for livelihood security of tribal communitiesthrough a Case Study in Paschimmedinipur District, West Bengal .They revealed that almost all of the forest- dwellers depend on the forest products to varying degrees. It was observed that 63% of forest- dwellers depend on the forest even for their cash income.

2013 Ajaz-ul-Islam *et.al*. (2013) Studied about the contributions of forest resources to the livelihood of tribal communities of Bundu block in Ranchi district of Jharkhand state. He found that sal leaf fetched highest earning (`208000/ annum) among surveyed households in the area than other NTFPS. And the livelihood generation from forest based secondary employment in the study area is nil as no woodbased or NTFPs based enterprises have been established.

Bauri *et.al.* (2013) studied about livelihood dependency of rural people utilizing non-timber forest product (NTFPs) in a west bengal, india. 23 major categories of non-timber forest products were recorded during research work at the current investigation which includes various forms of dyes, grass, oil, wax, honey, gum, resin, food items (leaf, fruit, seed, herb, stem), bamboo, broom, basket, cotton, brush, paper, ornamental, worship, marriage rituals, leaves (Sal, Kendu, Datepalm). The selling price for NTFPs ranges between Rs 1200-1400/-. whereas the income rate per person per day reflects significant variation ranging from Rs 200/- to 600/-.

Mishra and Naidu (2013) explained that NTFPs had obtained dubious distinction as being both 'safety net' and 'poverty trap'. When people had better employment opportunities, collection of NTFPs they could gain better livelihood opportunity of last resort. This was observed in the study area of forest of Chittoor East and Tirupati wildlife management Divisions of Andhra Pradesh after implementation of NREGS by the Govt. of India. Thus, the best way to protect forests would be to create better employment opportunities for the forest dependent people nearer to their habitations and reducing dependency on forest resources.

Sasmita *et al*. (2013) had a study on anthropogenic impacts on forests and dependence on fuel-wood and other products which they claimed to is one of the vital reasons for forest degradation. Using plot-based method they analysed the impact of native populations on vegetation structure and diversity of Sal dominated forests of Similipal Tiger Reserve (STR),Odisha,. They selected eight villages, four in the buffer zone and four in the core zone of STR. Then they laid two one-hectare plots in the forests adjacent to each village: one was the study plot where the local people extensively collected fuel-wood and fodder (calleddisturbed plot), whereas the other served as control and was locatedmore than 1 km away in a site with no current harvesting (called undisturbed plot). They also evaluated the extractionpressure on vegetation over a 21-month period from 2006 to 2008 In the study plots. All woody species = 3.18 cmdbh (diameter at breast height) were marked and tagged permanently. They monitored the rate of removal of plant parts like stem and branches at 3-month intervals to estimate extractionpressure. The species richness, diversity, basal area and stand density were less in the disturbed compared with the undisturbed plots. Mean extraction pressure, in terms of percent trees lopped/harvested mo-1, ranged from 1.2 - 11 % and was positively correlated with the population size of villages. Fuel-wood was the major product harvested. Hence an alternate source of domestic energy for rural households is crucial for arresting forest degradation.

Swain and Mohapatra (2013) Studied that there are three plant species, which have medicinal as well as non-medicinal values and are widely used across different tribal groups of Kalahandi districts of Odisha. They are sala (*S. robusta),* iamurala (*S. cumini*) and Limba (*A. indica*).

Yadav *et al*. (2013) stated about Status of Forest Products Production and Trade.He found that the study intended to understand the production and trade status of forest and how these products can be used in an improved way for reduction of poverty. Thus, the present study endeavoured to examine the trade status of forest products and their role in economy at global, national and regional level.

Bamboo (2016) studied about Plant Product Extraction with relation to Indian economy. He observed about the main source of income for the population dwelling in the vicinity of forests in many countries. He studied that the natural plant products trade depends on availability, production, marketing and the dependency of rural population on natural plant products.

Das (2016) studied three villages in vicinity of forests (near Simlipal wildlife sanctuary), of Mayurbhanj, Odisha . She Observed that female members collect and process the leaves. Almost all households in the study villages generate income by collecting sal leaves and stitching cup and plate and selling them in market. She also found that now they have to walk a longer distance to collect the (usual amount of) sal leaves. On asking does the JFM puts some restriction like (i) number of days of collection, (ii) number of collectors per family, the answers were almost negative as de facto control through JFM was almost zero. The inadequacy of sunlight for drying up the leaves during the rainy season only, the collection is less (only for home consumption or sale of leaves only and not for cup plate).

2.1 Marketing of NTFPs

Neumann (2000) explained about Commercialisation of Non-Timber Forest Products.He studied about Socio-Political Aspects of NTFP Commercialisation, Land and Resource Tenure. He explained about the effects of NTFP commercialisation on existing customary tenure systems vary greatly depending on such cultural and historical factors. Women are often the primary harvesters, processors and marketers of NTFPsfrom tropical forests. The labour for various activities involved in getting NTFPsfrom the forest to the market is commonly divided between genders, though not in an easily generalizable pattern.

Patra (2013) observed that the revenue maximization versus tribal welfare in kendu leaf trade in odisha .He explained thatkendu leaf trade provided more than 70 % of total forest revenue to government of Odisha. Marketing margin analyses help to know how the total sale value of kendu leaf was distributed among primary collectors, cost, commission agent and Royalty of Government (net profit). The profit was 44 % which went to government of Odisha as royalty but primary collector receives only 16 % in Odisha. The cost constitutes 33 % of total sale value of kendu leaf. The primary collectors (mostly tribes) got very low price for kendu leaf collection.

Sudhakar *et al.* (2013) opined that NTFPs have dragged considerable attention on global level due to the significant role played in facilitating people as well as industries. It is a solid fact that most tribals and poor people living in vicinity of forest regions depend largely on NTFPs as the source of their livelihood.

Kar (2014) studied about the challenges in marketing of different minor forest produces in Nayagarh district of Odisha. He found that more than 60% of the respondent households are dependant on daily wage for their livelihoods followed by NTFPs which acts as a savior for the survival of the community members in the lean period particularly in rainy and summer season.

Ranjan and Sashi (2015) studied about Marketing pattern of different NTFPs in Ranchi District of Jharkhand. They studied that Bamboo and Sal were collected throughout the year. Mainly Mahua, Karanj, Bamboo and sal leaves were value added to produce various products. The dependency on NTFP was more than other livelihood means as Tribals spend most of the time in vicinity of forests but income generated by the collectors was very less.

Kumar *et al.* (2015) ovserved that sal seeds can be processed for its fat or oil. It has a vital role in food and cosmetic sectors. The extracted Sal oil is greenish brown in colour and have a characteristic odour. The refined oil from Sal seed is used as edible cooking oil and substitutes for cocoa butter in chocolate manufacturing industries. It also used for the production of vanaspati, paints, pigments, lubricants, biogas and biodiesel. Besides that it's oil cake also has a good export market for cattle, poultry and fish feed.

Verma (2015) studied about the role of NTFP in supporting rural livelihoods and food security in Jharkhand. They observed that major employment (52%) was generated by the crops cultivation followed by NTFPs collection (30%) and other sectors (18%). In the study area, Mahuwa, Sal leaves and Tamarind accounts for more than 70 % of annual NTFPs income. Based on the employment generation capacity, Mahwa and Sal leaves are the major employment share in the study area. Agriculture accounts for an average annual income of Rs. 7956.88 per households and an average income from NTFP's is Rs. 6263.54 per households.

Ahmed *et al* (2016) studied that the affiliated LAMP Societies were conferred the monopoly rights for collection and disposal of Non Timber Forest Produces by th mainly Kendu Leaves and Sal Seeds The Forest Department of the Government of West Bengal. They have presented data for amount and expenses by LAMPS for Collection of Kendu Leaves and Sal seeds in PaschimMedinipur District (2013-14). These expenses by LAMPS are met by advance credit from WBTDCCL.

Das BB (2018) studied about Sustainable NTFPs harvesting in Keunjhar district of Odisha. He observed that there are approximately 700 million people living in and around the forests whose survival is dependent on supplementary income from NTFP. Over 50 per cent of the revenue earned by the forest department comes from NTFP. Small scale forest based enterprises depending on NTFPs, provide up to 50 per cent of the income for about 25 per cent of India's rural labour force. He found that in Keonjhar, Sal leaf, is extensively collected in tribal pockets both for subsistence and commercial use. The multi crore business of kendu (Diospyros melanoxylon) leaves, used for rolling bidis in the same region, also exists, with well determined markets, collection and post harvest management..

Dhingra *et al.* (2018) opined that Sal leaf plate making in Mayurbhanj in Odisha will start with the implementation of the gasifier as per the new policy of government of renewable-based decentralized distributed generation systems, such as biomass gasifiers as there is no supply of electricity in this village. Once the gasifier is installed, the forest department will support initiation of sal leaf plate making by the SHGs.The electricity provided by the gasifier will increase their annual income by 300%.

MATERIALS AND METHODS

Sal leaf is one of the most lucrative forest products that could become integral part of livelihood of forest fringe villages in Odisha. Dense sal forests with concentration of forest dependent communities have been observed in both Sambalpur and Deogarh districts of this state. Besides, year round wage engagement in sal leaf sector vs. other sectors regulating the dynamics of their economy and finally acquisition of their produce to avail consumers' satisfactions became central theme of present investigations. Nevertheless, the problems of market competition by alternative trencher or eating plates encountered at present to affect backbone this vocation became of great concern deserved special attention. The study was projected on 10 forest dependent villages with good spectrum of adjacent sal forests to enumerate their socio-economic profiles with magnitude of their occupational bondage with forests more particularly on sal leaf sector. The methodology used and procedures followed have been presented in this chapter under various sections as below.

3.1 Description of study area and sites

Sambalpur and Deogarh districts having dense sal forests with large spectrum of forest dependence were selected as study area.

3.1.1 District profile

Sambalpur district is situated in the river basin of Mahanadi. It has a total area of 6,702 km^2 (2,588 sq mile) of which 50.18% is covered by dense forests. Most of the people of this district are dependent on agriculture as primary occupation followed by secondary occupation forests (sambalpurforest.org). Forests plays vital role in the economy in terms of contribution towards revenue, domestic product as well as dependence of people for livelihood. According to the 2011 census Sambalpur district has a population of 1,044,410. This gives it a ranking of 433rd in India (out of a total of 640). The district has a population density of 158 inhabitants per square kilometre (410/sq mi). Its population growth rate over the decade 2001–2011 was 11.63%. Sambalpur had a sex ratio of 973 females for every 1000 males, and a literacy rate of 76.91% (http://www.census2011.co.in).

Debagarh/ Deogarh district is located in the northwestern part of Odisha state. The district covers an area of 2781.66 km² of which about 53.08% is covered by forest area. According to the census of 2011 it is the least populous district of Odisha having population of 312,164. This gives it a ranking of 571st in India (out of a total of 640). The district has a population density of 106 inhabitants per square kilometer. Its population growth rate over the decade 2001-2011 was 13.88%. Debagarh has a sex ratio of 976 females for every 1000 males, and a literacy rate of 73.07% (http://www.census2011.co.in).

Both the districts have average annual rainfall 1500 mm per year, forests 3C north Indian tropical moist deciduous and 5 B northern tropical dry deciduous (Champion and Seth) and location far away from the sea with prolong dry season, short monsoon period, poor moisture retention capacity of soils, low relative humidity and regular fires, thus large areas support dry forests. The eastern side of forests have Mahanadi with forests areas preponderance of sal and on the western side have miscellaneous species. Sal has on two location, viz., moist sal occurs in moist pockets in valleys and nalla banks and lower slopes of hills and dry sal in rest of the area.

Table.3.1: Geographical and socio-economic profiles of Sambalpur and Deogarh districts of Odisha

Parameters	Sambalpur district	Deogarh district
Latitude	21.4660°N	21.533°N
Longitude	83.983°E	84.733°E
Area (Sq. Km.)	6,702	2,781.66
Population(2011 census)	1,044,410	312,162
Population density (per sq.km)	158	106
Forest cover (Sq.kM)	3363.30	1560.62
Forest area as %ge of geographical area	50.18%)	53.08%
Average annual rainfall	581.9mm	101.4mm
Literacy rate	76.22%	72.57%

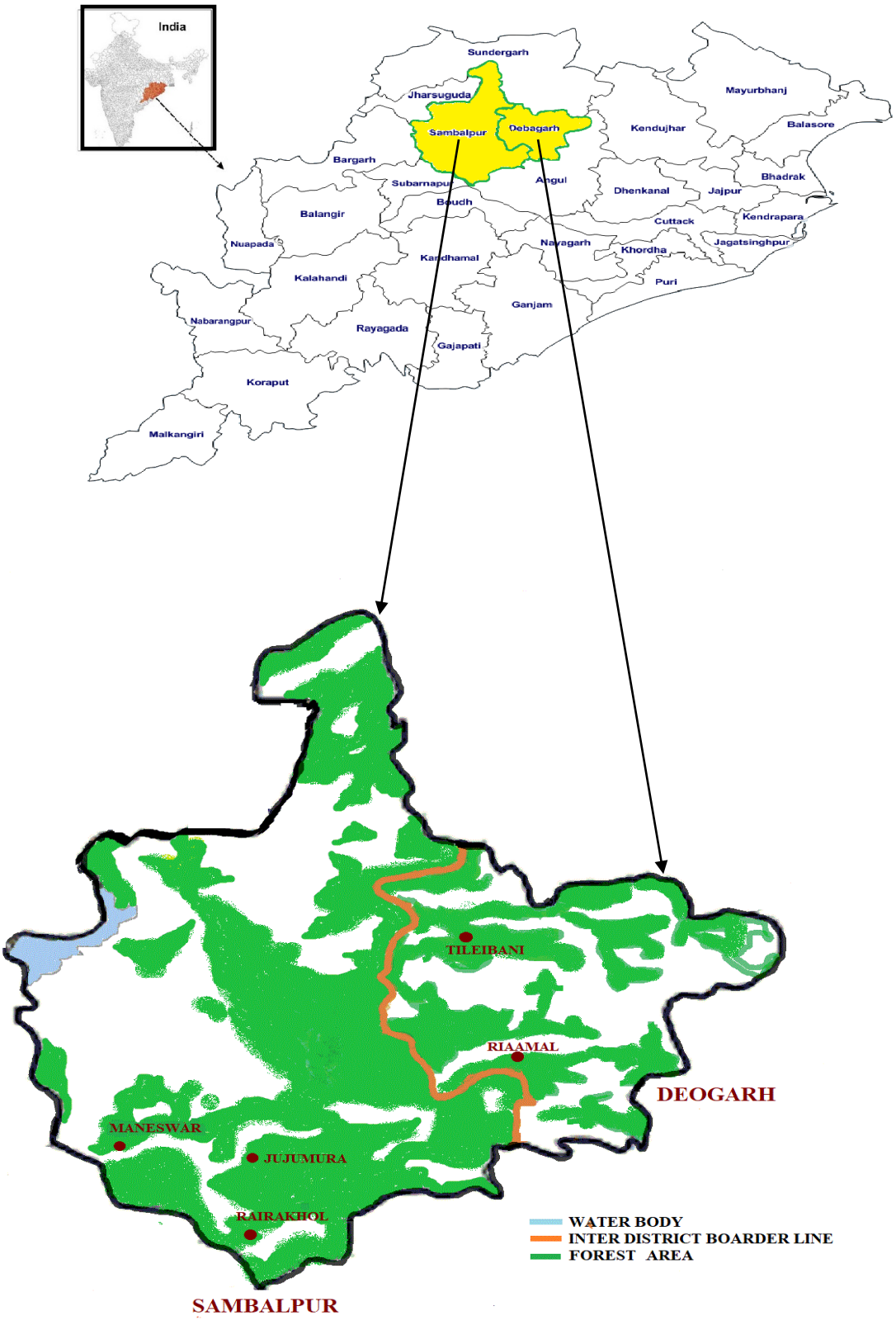
3.1.2: Site description

Total ten villages of five blocks of Sambalpur and Debgarh districts were selected purposefully for the study. Villages with high concentration of sal leaves having good access to forests were considered for selection of the villages. Besides, efforts were also made to select villages from different socio-economic back grounds e.g., location differences in accessibility were considered while selecting the villages. Villages were selected through purposive sampling method based on consultation with the officials from different departments in both of the districts. The details about the study sites have been documented in table no. 3.2.

Table.3.2: Study villages, their no. of households and sample size taken in Sambalpur and Debgarh districts.

District	Block	Serial No.	Village	No. of Households	No. of Respondents
Sambalpur	**Maneswar**	1	Gaudgad	130	35
		2	Degaon	146	45
	Jujumura	3	Kansar	185	50
		4	Dantri	52	15
	Rairakhol	5	Salesingh	95	30
		6	Patlipali	82	25
Debgarh	**Tileibani**	7	Bileighanti	62	20
		8	Kailash	220	45
	Riamal	9	Telimunda	85	25
		10	Naulipada	338	67
Total households				1368	357

Fig.3.1: Location of study area



3.2 Sampling procedure

Data collection was made very meticulously made among the communities who had dependency on sal leaves. Prior data collection preliminary appraisals were made in order to have basic knowledge about the area, villagers livelihood, education, infrastructure, etc. Rapport building with line departments, voluntary organizations, PRI members and villagers were made in order to get data based on the interview schedule. Further, the assessments was made based on the following tools; namely,

Interview schedule

Focused group discussion.

Case study

Secondary data collection etc.

3.2.2Interview schedule

The Interview Schedule had primarily five section i.e. Demographic Section, Livelihoods Section, Market section, section of challenges perceived by the respondents and feedback and suggestion section for improvement. 357 respondents were covered during data collection through Interview schedule. The interview schedule formulated initially was put into test check for finalization. The feedback received from the respondents were incorporated in the Interview schedule and finalized.

3.2.3Focussed group discussion

Some key checklists prepared on the thematic area of the study areas were administered in focused group discussion to understand the issues and challenges related to marketing of forestry commodities and other commodity as well. The questions raised in the FGD are as below…

I. Constraints on production and marketing of sal leaves
II. What are the possible solutions to the issues related to marketing.
III. Facilities provided by different government and non-government agencies to cater the livelihood dependence.
IV. Role of grass-root level organizations/ youths etc. in livelihood support and sal leaves marketing facilitating.

3.2.4 Collection of secondary data

The secondary data were collected from various sources such as the reports published by SC and ST Department, government of Odisha and reports published by different agencies of state and central government, thesis submitted and research papers, etc. Policies relating information on NTFPs were collected from web portal of Ministry of Tribal Welfare, Government of India and ST and SC corporation, Forest Department, OFDC, government of Odisha. The secondary data on NTFPs more particularly on sal leaf and information about market challenges in tribal areas were collected from various reports generated by leading N.G.O.s like Vasundhara, RCDC, etc.

3.2.5 Data analysis and interpretation

Both qualitative and quantitative methods were used for analysis and interpretation. The data were synthesized and incorporated in excel software. In this study, quantitative and qualitative methods were applied for analysing the data and information collected. Descriptive and inference analyses were applied to quantify perception of farmers for household interviewing.

3.3 Livelihood dependence inventories

As per the questions formulated in interview schedule (Appendix I) for respondents taken by the researchers. Apart from noting respondents gender, sex ratio per household was recorded. Landholding was recorded per household too, which was recorded per cent wise of sample villages. Education pattern was divided in to five categories like illiterate, up to primary, up to 10^{th}. Up to 12^{th}, up to graduation and it was followed by occupational study for which respondents replied questions relating to primary and secondary employment, Name of the primary occupation, secondary occupation, days involvement in both of these and income from both primary and secondary employment of individual of households were recorded. Information on potential availability of NTFPs were noted from interviewer and secondary data. Income generated from NTFPs of individual households were also recorded.

3.4 Assessment of marketing

Marketing information of sal leaf were studied under following headings.

3.4.1 Marketing channel design

A marketing channel may be defined in different ways the chain of intermediaries through whom the various commodities passed from producers to consumers. The course taken in the transfer of the title of a commodity constituted its channel of distribution. It is the route taken by a product in its passage from its first owner i.e. producer to the last owner, the ultimate consumer.

3.4.2 Marketing cost under various channels (Channel costing)

The movement of products from the producers to the ultimate consumers involved costs, taxes and cess which are called marketing costs. These costs varied with the channels through which a particular commodity passes through. Eg: - Cost of packing, transport, weighment, loading, unloading, losses and spoilages.

3.4.2.1Conventional method

Conceptually, efficiency of any activity or process is defined as the ratio of output to input. If 'O' and 'I' are respectively output and input of the marketing system and 'E' is the index of marketing efficiency, then , $E = \frac{O}{I} X\,100$

3.4.2.2 Shepherd's Method

Shepherd has suggested that the ratio of the total value of goods marketed to the marketing cost may be used as a measure of efficiency. The higher the ratio, the higher the efficiency and vice versa. This method eliminates the problem of measurement of value added. $ME = \frac{V}{I} - 1$

Where, ME = Marketing Efficiency

V = Value of goods purchased (Consumer's price)

I = Total Marketing Cost (i.e., Costs + Margins)

3.4.2.3 Acharya's Method

An ideal measure of marketing efficiency, particularly for comparing the efficiency of alternate markets/ channels, should be such which takes into account. Total marketing costs (MC), Net marketing margins (MM), prices received by the farmer (FP) and prices paid by the consumer (RP).

$$MME = FP / (MC + .MM)$$

Where MME is the modified measure of marketing efficiency and MC and MM are marketing costs and marketing margins, respectively.

Fig.3.1: Focus group discussion and household interview by researcher in study area.

a. Focus group discussion in Naulipada (Deogarh)

b. Households interview in Patlipali (Sambalpur)

Fig.3.2 Green leaf stitching for marketing with or without drying and dry leaf stitching for marketing

a. Green leaves stitching at Gaudgad (Sambalpur)

b. Dry leaves stitching at Kailash (Deogarh)

Fig.3.3: Drying of plates and cups before market disposal through the trade routes.

a. Drying of plates at Gaudgarh (Sambalpur)

b. Drying of cups at Salesingh (Sambalpur)

Fig.3.4:**Regional weekly hat for procurement by middle man prior disposal to zonal mandi.**

a. collection of produce by middle man from regional market at Maneswar (Sambalpur)

Fig.3.5: Flow of products from local and regional haat towards zonal mandi.

a. Disposal to zonal market at Kola (Deogarh)

b. zonal mandi of Golbazar (Sambalpur)

Fig.3.6: Sal leaf as back bone of rural economy for moribund and disadvantaged classes.

a. Avenue for living of poor in Kansar (Sambalpur).

b. Assured income of women in Kailash (deogarh).

3.4.3 Price spread under marketing channel

The difference between the price paid by the consumer and price received by the collector is called as price spread. It involves various costs incurred by various intermediaries and their margins.

3.4.11 Marketing margins

Margin refers to the difference between the price paid and received by a specific marketing agency, such as a single retailer or by any type of marketing agency such as A percentage margin is the absolute difference in price (absolute margin) divided by the selling price. Percentage margin of the middlemen

$$(\text{Pmi}) = \frac{\text{PRi} - (\text{PPi} + \text{Cmi})}{\boldsymbol{P}\text{Ri}} \text{X } 100$$

Where,

Pmi=Percentage margin of the middle man

PRi = Total value of receipts per unit (sale price)

Ppi = Purchase value of goods per unit (purchase price)

Cmi = Cost incurred on marketing per unit.

The margin includes profit to the middlemen and returns to storage, interest on capital, overheads and establishment expenditure. Collection cost/ bag over a period of time.

3.4.12 Marketable surplus

The marketable surplus is that quantity of the produce which became available to the non-farm population of the country. This may be expressed as follows:

MS = *P* - *C*

Where,

MS = Marketable surplus

P =Total production, and

C = Total requirements (family consumption, farm needs, payment to labour, artisans, landlord and payment for social and religious work).

Employment and income generation from sal leaf sector

3.4.13 Employment and income generation from sal leaf sector

The valuation of sal leaves may be generalized in terms of minimum procurement price i.e., Rs 21/kg. In terms of this rate, the wage earnings of sample

villages were calculated as product of man days and quantity of collection. Following two parameters have been taken into consideration.

3.4.13.1.Sector wise employment generation (man days) per annum

3.4.13.2. Sector wise income generation of both male and female

3.5 Challenges and solution

To solve the problem in marketing of sal leaf value chain analysis of sal leaf, SWOT analysis and Merits and demerits in the price of marketing and livelihood subsistencewere observed by researchers and merits, demerits of existing marketing channel and role of OFDC were studied.

3.6 Statisticalanalysis

χ2-test was applied for livelihood analysis only. χ^2 1 x 1 analysis was made to compare pooled frequencies (for each individual class frequencies observed for individual villages added together) among the classes in a parameter. The formula for calculation of χ^2 calculated followed was

$\chi 2 = \sum_{i=1}^{p} \frac{(ni-E)2}{E}$ and $E = (\sum_{i=1}^{p} ni)/P$

Where, p is the number of classes and n_i is pooled frequency of that class. the observed number of units falling into class i, and E= pooled expected frequency χ^2calculated value was compared with χ^2 tabular value with df = p-1and at 0.05 and 0.01 level of significance then it was inferred. When χ^2calculated > χ^2 tabulated: within the district for that particular parameter there is variation among classes otherwise it was considered as non-significant.

χ^2 2 x 2 used to compare interaction of villages over the parameter (education, land holding, occupation, duration of occupation or income) 6 villages = *r* rows, number of classes of parameter = c columns and n_{ij} = observed number of respondents in ith row (village) and jth column (parameter class). To calculate expected no of respondents in ith village and jth class formula E_{ij}= (Ri x Cj)/ G was followed where R_i is the total of the ith village, Cjis the total of the jth class, and G is the grand total respondents studied in all the villages. χ^2 value calculated with formula:

EXPERIMENTAL RESULTS

Results emanated out of the present investigation entitled "Livelihood dependence and marketing of sal leaves in Sambalpur and Debgarh district of Odisha." are hereby presented under the following headings.

4.1 Livelihood dependence inventory

Socio-economic profile of households in study area

The socio-economic profile of study area has been assessed through the parameters Individuals education status, land holding pattern, primary employment of households, days involvement in primary employment, annual income from primary employment, secondary employment of households, days involvement in secondary employment and income from secondary sources which have been presented in the table 4.1 to 4.8 and described in the para from 4.1.1 to 4.1.8 as below.

4.1.1 Individuals education status

From the inventory on the educational status of the study area, as per the pooled data $\chi^2_{0.01}$ (1 x 1) it has been observed that maximum percentage of population has fallen under illiterate class (32.72%), followed by primary education 27.23%, up to 10^{th} 16.23%, up to 12^{th} 10.73 % , up to graduation 6.81% and others 6.28%. Table 4.1 claims that maximum % age of literacy varies from minimum 48% at Kansar to maximum 76% at Telimunda. Highest percentage of matriculates i.e. 21.43% observed in Degaon. Least number of people in all sample villages were having education level graduation or higher education. The graduate group people are least in Patlipali and Telimunda both having percentage 4% and that of others group people are least in Dantri i.e. nil. Over the district tested by $\chi^2_{0.01}$ (1 x 1), education level was not uniform. According to $\chi^2_{0.05}$ (2 x 2) it was analysed that villages have significant effect on the education pattern of study area.

4.1.2 Land holding pattern

Table 4.2 and $\chi^2_{0.01}$ (1 x 1) reveals that there was no uniformity among landholders over the study area. There observed a highly significant variation among the number of` households. It was observed that maximum people were of landless class i.e. 38.64% followed by marginal farmer class i.e. 30.03%, then small farmer i.e. 12.27%, then small farmer i.e. 11.49% and the least is large farmer i.e. 7.57%. As per $\chi^2_{0.05}$ (2 x 2)analysis villages have no effect over the landholding pattern of the households. The village Dantri have the highest percentage of landless group (46.67%), followed by Kailash (44.44%), then Kansar (44.00%). and the least is Naulipada (29.85%). Percentage

Table 4.1 : Percentage population either illiterate or literate with category of educations in the studied villages of Sambalpur and Deogarh districts of Odisha.

Villages	Percentage of individuals Illiterate or Literate with respective educational status					
	Illiterate	Up to 5^{th}	Up to 10^{th}	Up to 12^{th}	Graduate	Others
Gaudgad	28.57	22.86	17.14	14.29	11.43	5.71
Degaon	27.14	25.71	21.43	10.00	8.57	7.14
Kansar	52.00	18.00	12.00	8.00	6.00	4.00
Dantari	26.67	33.33	20.00	13.33	6.67	0.00
Salesingh	33.33	26.67	13.33	10.00	6.67	10.00
Patlipali	32.00	24.00	20.00	12.00	4.00	8.00
Bileighanti	35.00	25.00	15.00	10.00	5.00	10.00
Kailash	33.33	28.89	15.56	11.11	6.67	4.44
Telimunda	24.00	36.00	16.00	8.00	4.00	12.00
Naulipada	29.85	34.33	13.43	11.94	5.97	4.48
District	32.72	27.23	16.23	10.73	6.81	6.28

Test (Comparison)	$\chi^2_{0.01}$ **1 x 1 (District)**			$\chi^2_{0.05}$ **2 x 2 (Village x Literacy)**		
	Cal.	**Tab. (0.01)**	**Remark**	**Cal.**	**Tab. (0.01)**	**Remarks**
Values	139.75	**15.09**	******	304.26	63.69	******

Table 4.2 : Households percentage as per land holding categories in sample villages of Sambalpur and Deogarh districts of Odisha

Land holding / Village	Percentage of Households in land holding classes (%)				
	Landless	**Marginal farmer**	**Small farmer**	**Medium Farmer**	**Large farmer**
Gaudgad	42.86	25.71	14.29	11.43	5.71
Degaon	41.43	32.86	8.57	10.00	7.14
Kansar	44.00	20.00	10.00	14.00	12.00
Dantari	46.67	33.33	13.33	6.67	0.00
Salesingh	33.33	26.67	16.67	13.33	10.00
Patlipali	32.00	24.00	16.00	16.00	12.00
Bileighanti	30.00	35.00	20.00	10.00	5.00
Kailash	44.44	24.45	13.33	11.11	6.67
Telimunda	42.31	23.08	15.38	11.54	7.69
Naulipada	29.85	44.78	8.96	10.45	5.96
District	38.64	30.03	12.27	11.49	7.57

Test (Comparison)	**$\chi^2_{0.01}$ 1 x 1 (District)**			**$\chi^2_{0.05}$ 2 x 2 (Village x Land holding)**		
	Cal.	**Tab. (0.01)**	**Remark**	**Cal.**	**Tab. (0.05)**	**Remarks**
Values	140.69	13.28	**	17.14	63.69	**NS**

of marginal farmers was highest in Naulipada (44.78%) and lowest in Kansar village (20.00%). Highest population of medium farmers is recorded at Patlipali (16.00) and least is at Dantri (6.67%). Maximum percentage of large farmers is observed in Kansar and Patlipali both having 12.00% where absence of large farmers is observed at Dantri.

4.1.3 Primary employment of households

From the focused group discussion and $\chi^2_{0.01}$ (1 x 1) test it was noticed that, maximum households of the study area were largely relied on agriculture (29.58%) followed by others (services, self-employed) (22.5%), then Daily wage (21.20), then livestock (17.02%) and the least on NTFPS (9.95%). $\chi^2_{0.05}$ (2 x 2)claims no effects of villages over primary employment (Table 4.3). However, the highest agricultural dependence for main income was recorded in Patlipali (44.00%), followed by Naulipada (41.79%) and the lowest in Telimunda (16%). Over the study area, 21.20% of people of all the households were engaged in daily wages. Bileighanti claimed the highest livestock dependency (35%). 17.02% of all the households depend on animal husbandry for their livelihood. Highest dependence on was claimed by Kansar (12%).

4.1.4 Days involvement annually in primary employment

According to Table 4.4 and $\chi^2_{0.01}$ (1 x 1) the highest percentage of people of all the villages (31.68%) were engaged in 150-200 days annually for primary employment. Only 5.50% of people of all villages had to devote less than 100 days annually for primary employment. According to $\chi^2_{0.05}$ (2 x 2) testing there is no remarkable effect of villages over the duration of engagement for primary employment. Salesingh demonstrated the highest percentage (10.00%), followed by Kailash (8.89%) working less than 100 days annually for primary employment for which least percentage (nil) were observed in Dantri and Bileighanti villages. Engagement of 100-150 days annually was highest in Dantri (40%) where as least was at Patlipali (4.00%). Engagement of 200 to 250 days annually was highest in Patlipali (32.00%) and least in Bileighanti (10.00%). Engagement of more than 250 days annually was highest in Naulipada (32.84%) and least at Dantri (13.33%).

4.1.5 Annual income from primary employment

There observed a wide variation among the households proportion as per income gradation from primary sources. Table 4.5 and $\chi^2_{0.01}$ (1 x 1) claims highest percentage of households (28.53%) availability in the income group 0.5-1 Lakh per annum for which the lowest (9.95%) observed with income more than 2 lakh per annum.

Table 4.3 : Percentage of households as per primary employment pattern of sample villages of Sambalpur and Deogarh districts of Odisha

Enterprise / Village	Household percentage involved in enterprises for primary employment (%)				
	Agriculture	**Livestock**		**Daily Wage**	**Others**
Gaudgad	31.43	11.43	8.57	22.86	25.71
Degaon	18.57	12.86	7.14	32.86	28.57
Kansar	22.00	12.00	12.00	22.00	32.00
Dantari	26.67	20.00	6.67	40.00	6.67
Salesingh	36.67	23.33	10.00	6.67	23.33
Patlipali	44.00	12.00	8.00	20.00	16.00
Bileighanti	25.00	35.00	10.00	10.00	20.00
Kailash	33.33	26.67	8.89	11.11	20.00
Telimunda	16.00	32.00	12.00	4.00	36.00
Naulipada	41.79	8.96	13.43	26.87	8.96
District	29.58	17.02	9.95	21.20	22.25

Test (Comparison)	$\chi^2_{0.01}$ **1 x 1 (District)**			$\chi^2_{0.05}$ **2 x 2 (Village x Enterprise)**		
	Cal.	**Tab. (0.01)**	**Remark**	**Cal.**	**Tab. (0.05)**	**Remarks**
Values	39.78	13.28	**	60.08	63.69	**NS**

Table 4.4 : Percentage of households involved in duration for primary employment per annum in sample villages of Sambalpur and Deogarh districts of Odisha.

Days / Village	Percentage of Households engaged in durations for primary employment (%)				
	<100	**100-150**	**150-200**	**200-250**	**250-300**
Gaudgad	5.71	14.29	34.29	25.71	20.00
Degaon	4.29	12.86	35.71	28.57	18.57
Kansar	4.00	26.00	28.00	18.00	24.00
Dantari	0.00	40.00	26.67	20.00	13.33
Salesingh	10.00	13.33	30.00	26.67	20.00
Patlipali	4.00	12.00	36.00	32.00	16.00
Bileighanti	0.00	20.00	40.00	10.00	30.00
Kailash	8.89	24.44	26.67	22.22	17.78
Telimunda	8.00	20.00	32.00	24.00	16.00
Naulipada	5.97	20.90	29.85	10.45	32.84
District	5.50	19.37	31.68	21.47	21.99

Test (Comparison)	$\chi^2_{0.01}$ **1 x 1 (District)**			$\chi^2_{0.05}$ **2 x 2 (Village x Duration)**		
	Cal.	**Tab. (0.01)**	**Remark**	**Cal.**	**Tab. (0.05)**	**Remarks**
Values	67.45	13.28	****	30.42	63.69	**NS**

Table 4.5: Percentage of households as per ranges of annual primary income in sample villages of Sambalpur and Deogarh districts of Odisha.

Income (Lakh.) / Village	Household percentage as per ranges of annual primary income (%)				
	<0.5	**0.5-1.0**	**1.0-1.5**	**1.5-2.0**	**>2.0**
Gaudgad	5.71	37.14	34.29	14.29	8.57
Degaon	14.29	31.43	21.43	22.86	10.00
Kansar	18.00	26.00	20.00	22.00	14.00
Dantari	26.67	33.33	20.00	13.33	6.67
Salesingh	23.33	33.33	26.67	10.00	6.67
Patlipali	24.00	36.00	20.00	12.00	8.00
Bileighanti	20.00	40.00	30.00	5.00	5.00
Kailash	13.33	15.56	44.44	11.11	15.56
Telimunda	24.00	16.00	36.00	16.00	8.00
Naulipada	14.93	26.87	19.40	29.85	8.96
District	16.75	28.53	26.44	18.32	9.95

Test (Comparison)	$\chi^2_{0.01}$ **1 x 1 (District)**			$\chi^2_{0.05}$ **2 x 2 (Village x Income)**		
	Cal.	**Tab. (0.01)**	**Remark**	**Cal.**	**Tab. (0.05)**	**Remarks**
Values	43.68	13.28	**	9.41	63.69	**NS**

Maximum percentage of population in the 0.5-1 lakh per annum group was observed in Bileighanti village (40.00%) and the least was reported in village Kailash (15.56%). Highest percentage of income group 1-1.5 lakh was observed in Telimunda (36.00%) where least was at Naulipada (19.40%). Maximum percentage of household belonging to 1.5-2 lakh income class was reported in Naulipada (29.85%) and least was at Bileighanti (5.00%). Kailash was observed having maximum percentage of more than 2lakh income group (15.56%) and Bileighanti was having minimum (5.00%).

4.1.6 Secondary employment of households

It was observed from the focused group discussion and interaction with respondents that maximum percentage of their reliability (44.24%) was projected on for secondary employment followed by livestock (23.04%), then others (16.23%), then daily wages (8.90%) , least being Agriculture (7.59%). Highest percentage of household depending on was observed at Dantri (60.00%), followed by Patlipali (48.00%), then Bileighanti (45.00%), and the least was at Salesingh (33.33%). Bileighanti and salesingh were observed having maximum households (30.00%) depending on animal husbandary as their secondary sourse of income and Dantri was having the least (6.67%). Highest percentage of household depending on Daily wages was reported in Dantri and salesingh (13.33%) and no household was depending on the same as theire secondary sourse of income at Bileighanti village. Highest percentage of household depending on other sourses was reported in Bileighanti(25.00%) and the least was at Patlipali (8.00%). Highest percentage of population relying on Agriculture as secondary sourse of income was observed in Telimunda (12.00%) and no household was found depending on the same in Dantri and Bileighanti villages.

4.1.7 Days involvement in secondary employment

Days engaged by households was mostly confined to annually less than 100 days for secondary profession. $\chi^2_{0.01}$1 x 1 and $\chi^2_{0.05}$ 2x 2 (Table 4.7) demand highly non significant variations within the district on density of population as per density secondary Profession and interaction between village × population percentage as per duration of secondary profession. All the villages observed to be having maximum households secondary occupation duration lying beside 100 days.

Table 4.6 : Percentage of households in different secondary employment in sample villages of Sambalpur and Deogarh districts of Odisha.

Enterprise / Village	Percentage of Secondary employment				
	Agriculture	**Livestock**	**NTFPs**	**Daily Wage**	**Others**
Gaudgad	14.29	20.00	42.86	8.57	14.29
Degaon	4.29	21.43	44.29	11.43	18.57
Kansar	4.00	20.00	50.00	8.00	18.00
Dantari	0.00	6.67	60.00	13.33	20.00
Salesingh	10.00	30.00	33.33	13.33	13.33
Patlipali	8.00	24.00	48.00	12.00	8.00
Bileighanti	0.00	30.00	45.00	0.00	25.00
Kailash	8.89	22.22	44.44	11.11	13.33
Telimunda	12.00	24.00	40.00	4.00	20.00
Naulipada	10.45	26.87	41.79	5.97	14.93
District	7.59	23.04	44.24	8.90	16.23

Test (Comparison)	$\chi^2_{0.01}$ **1 x 1 (District)**			$\chi^2_{0.05}$ **2 x 2 (Village x Enterprise)**		
	Cal.	**Tab. (0.01)**	**Remark**	**Cal.**	**Tab. (0.05)**	**Remarks**
Values	169.65	13.28	**	22.64	63.69	**NS**

Table 4.7 : Percentage of households in days engaged annually in secondary employment in sample villagers of Sambalpur and Deogarh districts of Odisha.

Duration / Village	Households percentage as per days in secondary employment (%)				
	<100	**100-150**	**150-200**	**200-250**	**250-300**
Gaudgad	38.89	19.44	13.89	11.11	16.67
Degaon	44.29	21.43	11.43	8.57	14.29
Kansar	40.00	28.00	20.00	8.00	4.00
Dantari	46.67	26.67	13.33	0.00	13.33
Salesingh	33.33	26.67	10.00	13.33	16.67
Patlipali	48.00	12.00	16.00	8.00	16.00
Bileighanti	40.00	30.00	15.00	0.00	15.00
Kailash	37.78	24.44	8.89	11.11	17.78
Telimunda	32.00	24.00	24.00	0.00	20.00
Naulipada	32.84	22.39	20.90	5.97	17.91
District	38.90	23.24	15.40	7.57	14.88

Test (Comparison)	$\chi^2_{0.01}$ **1 x 1 (District)**			$\chi^2_{0.05}$ **2 x 2 (Village x Duration)**		
	Cal.	**Tab. (0.01)**	**Remark**	**Cal.**	**Tab. (0.05)**	**Remarks**
Values	109.08	13.28	****	24.00	63.69	**NS**

Table 4.8 : Percentage of households in various annual income groups as secondary sources in sample villages of Sambalpur and Deogarh districts of Odisha

Income (Rs.) / Village	Percentage of Households over secondary income ranges (%)				
	<1000	**100-5000**	**5000-10000**	**10000-15000**	**>15000**
Gaudgad	22.86	28.57	22.86	14.29	11.43
Degaon	10.00	31.43	28.57	15.71	14.29
Kansar	12.00	12.00	30.00	26.00	20.00
Dantari	6.67	13.33	26.67	33.33	20.00
Salesingh	10.00	13.33	20.00	33.33	23.33
Patlipali	8.00	16.00	24.00	32.00	20.00
Bileighanti	10.00	15.00	25.00	30.00	20.00
Kailash	6.67	11.11	26.67	33.33	22.22
Telimunda	8.00	12.00	28.00	32.00	20.00
Naulipada	7.46	8.96	23.88	37.31	22.39
District	10.21	17.02	25.92	27.75	19.11

Test (Comparison)	**$\chi^2_{0.01}$ 1 x 1 (District)**			**$\chi^2_{0.05}$ 2 x 2 (Village x income)**		
	Cal.	**Tab. (0.01)**	**Remark**	**Cal.**	**Tab. (0.05)**	**Remarks**
Values	38.31	13.28	**	34.25	63.69	**NS**

In which Patlipali recorded highest population percentage (48.00%) and excelled its counterparts i.e., Dantri (46.67%), Degaon (44.29%) and the least is Telimunda (32%). The duration of secondary profession more than 250 days was covered with maximum households percentage in Telimunda (20.00%) which was followed by Naulipada (17.91.%) and the least in Kansar (4.00%).

4.1.8 Income from secondary sources

There exists heterogeneity of secondary income within the district from pooled data(Table 4.8, $\chi^2_{0.01\ (}$1 x 1). Maximum no of households realized annual secondary income Rs.10,000-15,000 (27.75%) followed by the secondary income group Rs.5000-10000 per annum (25.92%), then more than Rs. 15000 per annum group (19.11%) and the least is less than 1000 group (10.21%). Villages have no significant effect on secondary income group of studied villages ($\chi^2_{0.05}$2 x 2). However , it was clear that there was no uniformity trend among villages in household density as per secondary income. Village having maximum percentage of households in income group 10000-15000 was Naulipada (37.31%) , and the least was at Gaudgad (14.29%). Maximum percentage of household of morethan 15000 income group was observed in salesingh (23.33%) and the least was at Gaudgad (11.43%). Village having maximum percentage of households in secondary income group less than 1000 was Gaudgad (22.86%) , and the least was at Dantri and Kailash (6.67%).

4.1.9. NTFPs availability and collection

From the analysis of the availability, extraction and marketing scenario of NTFPs, it was observed that there exists a wide diversity in their market potential throughout the study area (table.4.9 and figure 4.1). Major potential available in the study area are, sal leaves, kendu leaves, mahua, firewood, edible bamboo shoots(karadi), siali, and fodder. Sal is most abundantly available in all villages. Kendu leaf is most abundant in Gaudgad, Degaon, Bileighanti, Telimunda and Naulipda and abundantly available in rest of the villages. Mahul is most abundantly available in all villages of Deogarh district i.e. Bileighanti, Kailash, Naulipada and Telimunda, whereas abundantly available in Gaudgad, Degaon, Dantri and Kansar but in Salesingh and Patlipali s it's availability is sporadic. Firewood is abundantly available in Dantri, Bileighanti and Kailash. It's availability is sporadic in rest all villages except Gaudgad and Deogaon where it is less abundant. Edible bamboo shoot (karadi) is abundant in Kansar and Dantri villages whereas it's availability is sporadic in Bileighanti and Kailash but it is less

abundant in rest all villages. Tamarind is abundantly available in Gaudgad, Dantri, Bileighanti and Salesingh. It's availability is sporadic in Degaon , kansar and Patlipali, whereas it is less abundant in Kailash, Naulipada and Telimunda. Fodder is abundantly available in almost all villages. Siali is not available in Sambalpur District but abundantly available in Kailash and Bileighanti villages of Deogarh district. It's availability is sporadic in Telimunda and Naulipada villages. are sold on the following prices. i. sal Rs 30/kg, mahua Rs 20/kg, Tamarind Rs 35/ kg, Firewood Rs 4/kg, Chironji Rs 90/kg, Karadi Rs 40-60/kg and fodder Rs 10/kg. Sal is collected during April, may and june and September ,October, Mahua is collected in April , May and June, Tamarind is available in May and June, Chironji is available in April-May, Karadi is collected in July, August and September whereas firewood and fodder are collected year around. The people of all the villages sold surplus mahua in local bhati after own consumption. Sal leaves after plate making locally sold in hat and sold to agents of traders.

4.1.10 Lean season peak season prices spread

Among all available in sample villages karadi has most wide price variation between lean season (40/kg) and peak season (60/kg). The Price of sal varies from Rs 11 to 15 / bida in lean season whereas it is Rs 10 in peak season. The price of Chironji and Firewood remained the same regardless of peak or lean season i.e. Rs 90/kg to Rs100/kg and Rs 4/kg respectively. The price variability of siali is almost the same with sal. The price of tamarind is Rs 35/kg in lean season and Rs 30/kg at peak season. Interesting fact is that the price of all other products declines in peak period and increases in lean season but that of karadi is vice versa of this phenomenon. The reason behind this might be that there is a high demand of fresh and good quality karadi, which is available in peak season only.

Fig 4.1: Potential non-timber forest products available in sample villages of Sambalpur and Deogarh districts of Odisha.

Product	Gaudgad	Degaon	Kansar	Dantari	Salesingh	Patlipali	Bilei-ghanti	Kailash	Teli-munda	Naulipada
Mahula										
Sal										
kendu										
Fire wood										
chironji										
bamboo										
Tamarind										
Fodder										
Siali										

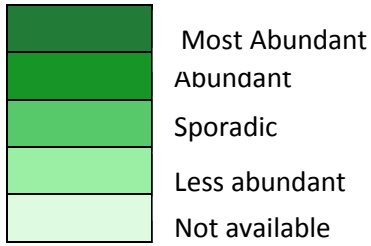


Fig 4.2: Calendar of collection in Sambalpur and Deogarh districts.

MONTH / NTFPs	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Sal												
Mahula												
Karadi												
Kendu												
Tamarind												
Chironji												
Siali												

Table 4.9: Collection of per households and their ways of marketing in Sambalpur and Deogarh Districts of Odisha.

Particulars / Product	Annual collection per household			Annual consuption per household	Annual Marketable Surplus per household	Place at which sold					Price at which sold	Average annual income from (Rupees)
	Annual collection	Season of collection	Daily Collection			Neighbours	Local shop	Hat	Trader outside village	Any other		
sal (kg)	450 kg	Apr-June, Sept-Oct	5 kg	60 kg	390 kg	✓		✓	✓		Rs 30/ kg	11700.00
Tamarind (kg)	150 kg	May-June	2.5 kg	45 kg	105 kg		✓	✓	✓		Rs. 35/kg	3675.00
Mahula(kg)	200 kg	Apr-June	3.5 kg	10 kg	190 kg		✓	✓	✓		Rs. 20/ kg	3800.00
Fire wood (kg)	3000 kg	Year round	10 kg	2000 kg	1000 kg	✓					Rs. 4/kg	4000.00
chironji (kg)	90 kg	Apr-May	1.5 kg	8 kg	82 kg			✓			Rs. 90/ kg	7380.00
karadi (kg)	180 kg	July-sept	4.5 kg	10 kg	170 kg			✓	✓		Rs. 60/kg	10200.00
Fodder (kg)	1200 kg	Year round	4 kg	1000 kg	200 kg	✓					Rs. 10/ kg	2000.00
Bamboo	50 pieces	Year round	3 pieces	20 pieces	30 pieces	✓		✓			Rs.50/piece	1500.00

Note: All the documented here with are not collected by every individual household, however, the figure reveals the average quantum of collection per household among the collectors of those enterprise.

Table 4.10: Lean season and peak season price of NTFPs

Sl. No.	Name of the	Lean season price (Rs.)	Peak season price (Rs.)	Minimum support price (Rs.)
1	Mahula	20/kg	15/kg	20/kg
2	Sal	30/kg	18/kg	21/kg
3	Fire wood	4/kg	4/kg	4/kg
4	chironji	110/kg	100/kg	100/g
5	Bamboo (karadi)	40/kg	60/kg	-
6	Tamarind	35/kg	25/kg	25/kg
7	Siali	30/kg	18/kg	21/kg

Table 4.11. : Percentage share of expenses in sal leaf under various components in study area.

Sl.No	Particular	Share of total income (%)
1	Collection	22.35
2	processing	22.58
3	Binding/ Bagging,	22.50
4	Transportation	16.57
5	Entry tax	18.00
	Total	100

4.1.11 Sector wise employment and income generation per annum from sal leaf.

Despite the variability in price among markets as well as villages, the valuation of sal leaves may be generalized in terms of minimum procurement price i.e., Rs 21/kg. This rate governed the wage earning of sample villages; which have been presented in table no 4.12 as product of man days and quantity of collection. It has sowed total earning from sal leaves was highest with 64.7 lakh in Naulipada which was followed by Kansar (42.52 lakh), Kailash (42.51lakh), Degaon (27.9 lakh), Gaudgad (24.8 lakh), Salesingh (18.13 lakh), Patlipali (15.7 lakh) Telimunda (14.3 lakh) and the least was in Dantari (13.9 lakh). On an average an individual collector collects 607 Kg 875 g. The calendar of collection however not uniform year round, because in the peak period i.e. April to mid June, September and October provides good quantum of leaves with efficiency much more. On the other hand the lean period i.e. July, August and November provides poor collection with less efficiency. No village was observed to involve males in Processing sector (stitching, drying, binding). In all villages only females were involved in processing of sal leaves. Income from males was highest in Naulipada (24.586 lakh), followed by Kailash (16.15 lakh), Kansar (16.14lakh), Degaon (10.6 lakh), Gaudgad (9.462 lakh), Salesingh (6.878 lakh), Patlipali (5.434lakh) Telimunda (5.434lakh) and the least was in Dantari (5.282 lakh). Income from females was highest in Naulipada (40.11lakh), followed by Kailash (26.35 lakh), Kansar (26.35lakh), Degaon (17.2 lakh), Gaudgad (15.438 lakh), Salesingh (15.43 lakh), Patlipali (9.734 lakh) Telimunda (8.866 lakh) and the least was in Dantari (15.438 lakh). Males earned more income in collection sector while females earned more in processing sector. Males from age group 50 to 75 and females from age group 25 to 30 earned more income from sal leaves.

The employment generation of sal leaves has been documented in table no. 4.13 which has sowed sector wise number of man days utilized in collection, processing and marketing of sal leaves in the sample villages. It has sowed total number of man days was highest with 81120 in Naulipada which was followed by Kansar (53281), Kailash (53280), Degaon (53080), Gaudgad (31200), Salesingh (22700), Patlipali (19680) Telimunda (17920) and the least was in Dantari (17440). No of mandays of males was highest in Naulipada (50294), followed by Kailash (20246), Kansar (20246), Degaon (13315), Gaudgad (11856), Salesingh (8634), Patlipali (7478) Telimunda (6810) and the least was in Dantari (6627). Mandays of females was highest in Naulipada (50294),

followed by Kailash (33034), Kansar (33033), Degaon (21725), Gaudgad (19344), Salesingh (14086), Patlipali (12202) Telimunda (11110) and the least was in Dantari (10813). Males from age group 50 to 75 and females from age group 25 to 30 devoted more hours in collection and processing sectors.

4.1.12 Calender of quantum of marketing (kg), wage engagement and quantity collection of sal leaves in study villages of Sambalpur and Deogarh districts.

It has been observed from the market scenario of sal leaves in the study area that marketing of sal leaves was highest in December (14%), followed by june (13%) , then in January (12%) and the least was in March and August (3%) (Fig.4.3). Marketing of sal leaves was highest throughout the year in Naulipada, followed by Kailash and the least was at Bileighanti (Fig.4.4). The calendar of wage engagement (Fig.4.5) and quantity of collection of sal leaves(Fig.4.6) varied widely from the Calender of quantum of marketing (kg). Quantity of sal leaves collected was highest in April and May, followed by October, least in July and August and almost nil in December to March. wage engagement in collection and processing of sal leaves was highest in May, followed by June, September and October, least in July and August but almost nil in December to March. wage engagement and quantity collection of sal leaves both were highest throughout the year in Naulipada, followed by Kailash and the least was at Bileighanti.

4.1.12 Correlation of Forest dependence with other Parameters

From the rank correlation studies (Table 4.14) of the qualitative data, from various ranks comparing sal leaf dependency as percentage of income from forest with the remoteness of household habitation from forest, Infrastructure (irrigation, education access, institutional linkage etc), education status, Distance from main road, House hold size, and sal tree density of sample villages taken from the household, it has been observed that, sal leaf dependency has been positively and significantly correlated with nearness to forest ($r = 0.696$) , negatively correlated with literacy rate ($r = -0.139$), land holding ($r = -0.393$), , cropping pattern ($r = -0.393$) and infrastructure ($r = -0.563$) but not significant. Sal leaf dependency is positively and most significantly correlated with sal tree density ($r = 0.781$) and positively but not significantly correlated with distance from road ($r = 0.551$

Table 4.12 : Sector wise income generation of both male and female (from sal leaf in studied villages of Sambalpur and Deogarh districts of Odisha.

	Gaudgad			Degaon			Kansar			Dantari			Salesingh			Patlipali			Bilei-ghanti			Kailash			Teli-munda			Naulipada		
	C	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**
Male (yr) 0-25	0.398	-	0.896	0.446	-	1.004	0.680	-	1.530	0.222	-	0.500	0.290	-	0.652	0.251	-	0.565	0.189	-	0.425	0.680	-	1.530	0.229	-	0.515	1.035	-	2.329
25-50	0.996	-	2.017	1.116	-	2.260	1.700	-	3.443	0.556	-	1.126	0.724	-	1.466	0.628	-	1.272	0.472	-	0.956	1.700	-	3.443	0.572	-	1.158	2.588	-	5.241
50-75	3.237	-	1.210	3.627	-	1.356	5.525	-	2.066	1.807	-	0.676	2.353	-	0.880	2.041	-	0.763	1.534	-	0.573	5.525	-	2.066	1.859	-	0.695	8.411	-	3.144
75-100	0.149	-	0.224	0.167	-	0.251	0.255	-	0.383	0.083	-	0.125	0.109	-	0.163	0.094	-	0.141	0.071	-	0.106	0.255	-	0.383	0.086	-	0.129	0.388	-	0.582
Total	**4.980**	-	**4.482**	**5.580**	-	**5.022**	**8.500**	-	**7.650**	**2.780**	-	**2.502**	**3.620**	-	**3.258**	**3.140**	-	**2.826**	**2.360**	-	**2.124**	**8.500**	-	**7.650**	**2.860**	-	**2.574**	**12.940**	-	**11.646**
Female (yr) 0-25	0.249	2.241	0.598	0.279	2.511	0.670	0.425	3.825	1.020	0.139	1.251	0.334	0.181	1.629	0.434	0.157	1.413	0.377	0.118	1.062	0.283	0.425	3.825	1.020	0.143	1.287	0.343	0.647	5.823	1.553
25-50	0.623	5.603	1.494	0.698	6.278	1.674	1.063	9.563	2.550	0.348	3.128	0.834	0.453	4.073	1.086	0.393	3.533	0.942	0.295	2.655	0.708	1.063	9.563	2.550	0.358	3.218	0.858	1.618	14.558	3.882
50-75	0.311	2.801	0.747	0.349	3.139	0.837	0.531	4.781	1.275	0.174	1.564	0.417	0.226	2.036	0.543	0.196	1.766	0.471	0.148	1.328	0.354	0.531	4.781	1.275	0.179	1.609	0.429	0.809	7.279	1.941
75-100	0.062	0.560	0.149	0.070	0.628	0.167	0.106	0.956	0.255	0.035	0.313	0.083	0.045	0.407	0.109	0.039	0.353	0.094	0.030	0.266	0.071	0.106	0.956	0.255	0.036	0.322	0.086	0.162	1.456	0.388
Total	**1.245**	**11.205**	**2.988**	**1.395**	**12.555**	**3.348**	**2.125**	**19.125**	**5.100**	**0.695**	**6.255**	**1.668**	**0.905**	**8.145**	**2.172**	**0.785**	**7.065**	**1.884**	**0.590**	**5.310**	**1.416**	**2.125**	**19.125**	**5.100**	**0.715**	**6.435**	**1.716**	**3.235**	**29.115**	**7.764**

Note: C= collection, P= processing and M= marketing. No male engagement in processing of sal leaves in sample villages

Table 4.13 : Sector wise employment generation (man days) per annum from sal leaf in studied villages of Sambalpur and Deogarh districts of Odisha.

	Gaudgad			Degaon			Kansar			Dantari			Salesingh			Patlipali			Bilei-ghanti			Kailash			Teli-munda			Naulipada		
	C	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**	**C**	**P**	**M**
Male (yr) 0-25	499	-	1123	561	-	1261	852	-	1918	279	-	628	364	-	818	315	-	708	238	-	536	852	-	1918	287	-	645	1298	-	2920
25-50	1248	-	2527	1402	-	2838	2131	-	4316	698	-	1413	909	-	1840	787	-	1594	595	-	1205	2131	-	4316	717	-	1452	3245	-	6571
50-75	4056	-	1516	4555	-	1703	6926	-	2589	2267	-	848	2954	-	1104	2558	-	956	1934	-	723	6926	-	2589	2330	-	871	10546	-	3942
75-100	187	-	281	210	-	315	320	-	480	105	-	157	136	-	204	118	-	177	89	-	134	320	-	480	108	-	161	487	-	730
Total	**6240**	-	**5616**	**7008**	-	**6307**	**10656**	-	**9590**	**3488**	-	**3139**	**4544**	-	**4090**	**3936**	-	**3542**	**2976**	-	**2678**	**10656**	-	**9590**	**3584**	-	**3226**	**16224**	-	**14602**
Female (yr) 0-25	312	2808	749	350	3154	841	533	4795	1279	174	1570	419	227	2045	545	197	1771	472	149	1339	357	533	4795	1279	179	1613	430	811	7301	1947
25-50	780	7020	1872	876	7884	2102	1332	11988	3197	436	3924	1046	568	5112	1363	492	4428	1181	372	3348	893	1332	11988	3197	448	4032	1075	2028	18252	4867
50-75	390	3510	936	438	3942	1051	666	5994	1598	218	1962	523	284	2556	682	246	2214	590	186	1674	446	666	5994	1598	224	2016	538	1014	9126	2434
75-100	78	702	187	88	788	210	133	1199	320	44	392	105	57	511	136	49	443	118	37	335	89	133	1199	320	45	403	108	203	1825	487
Total	**1560**	**14040**	**3744**	**1752**	**15768**	**4205**	**2664**	**23976**	**6394**	**872**	**7848**	**2093**	**1136**	**10224**	**2726**	**984**	**8856**	**2362**	**744**	**6696**	**1786**	**2664**	**23976**	**6394**	**896**	**8064**	**2150**	**4056**	**36504**	**9734**

Note: C= collection, P= processing and M= marketing. No male engagement in processing of sal leaves in sample villages

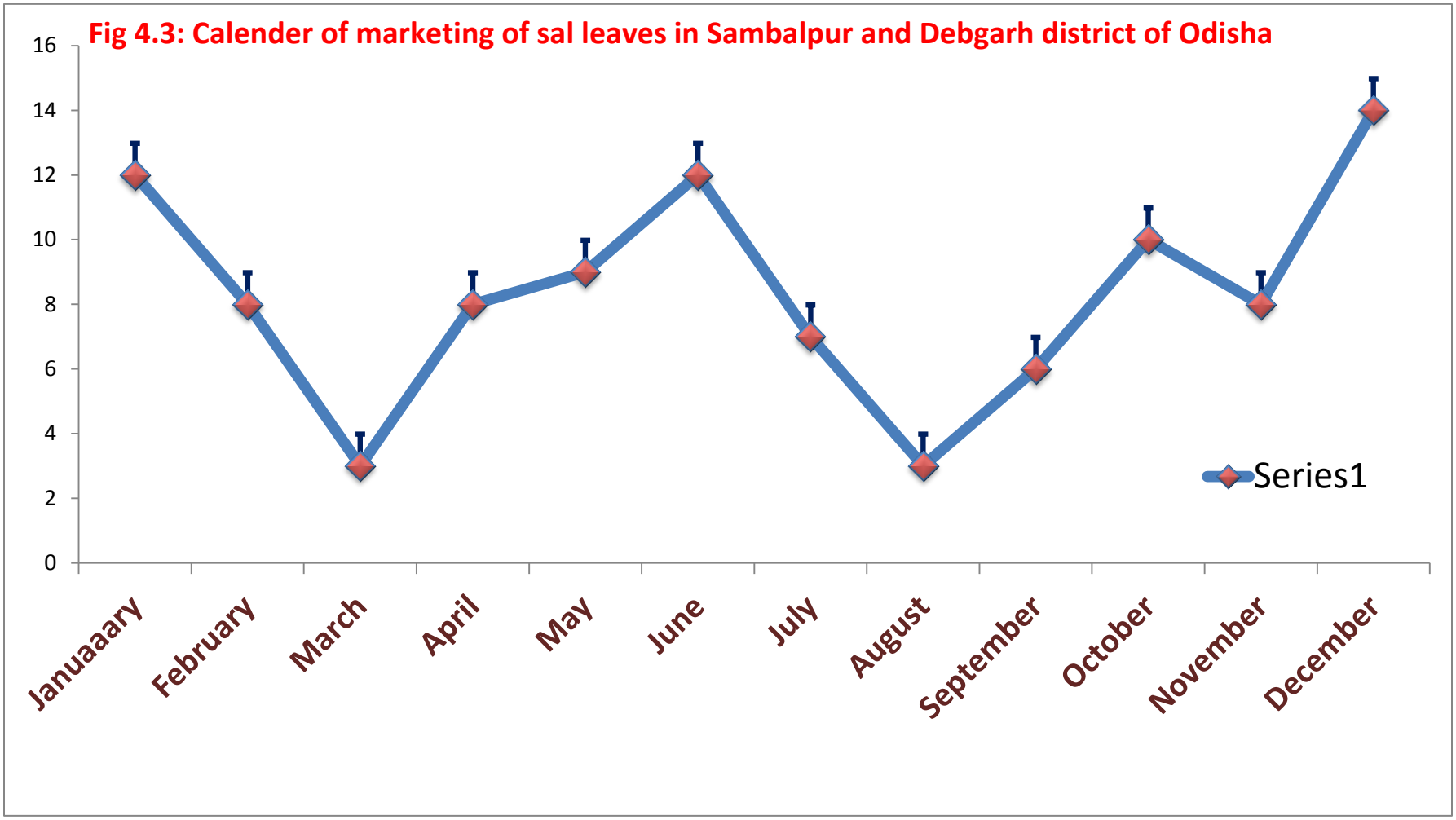
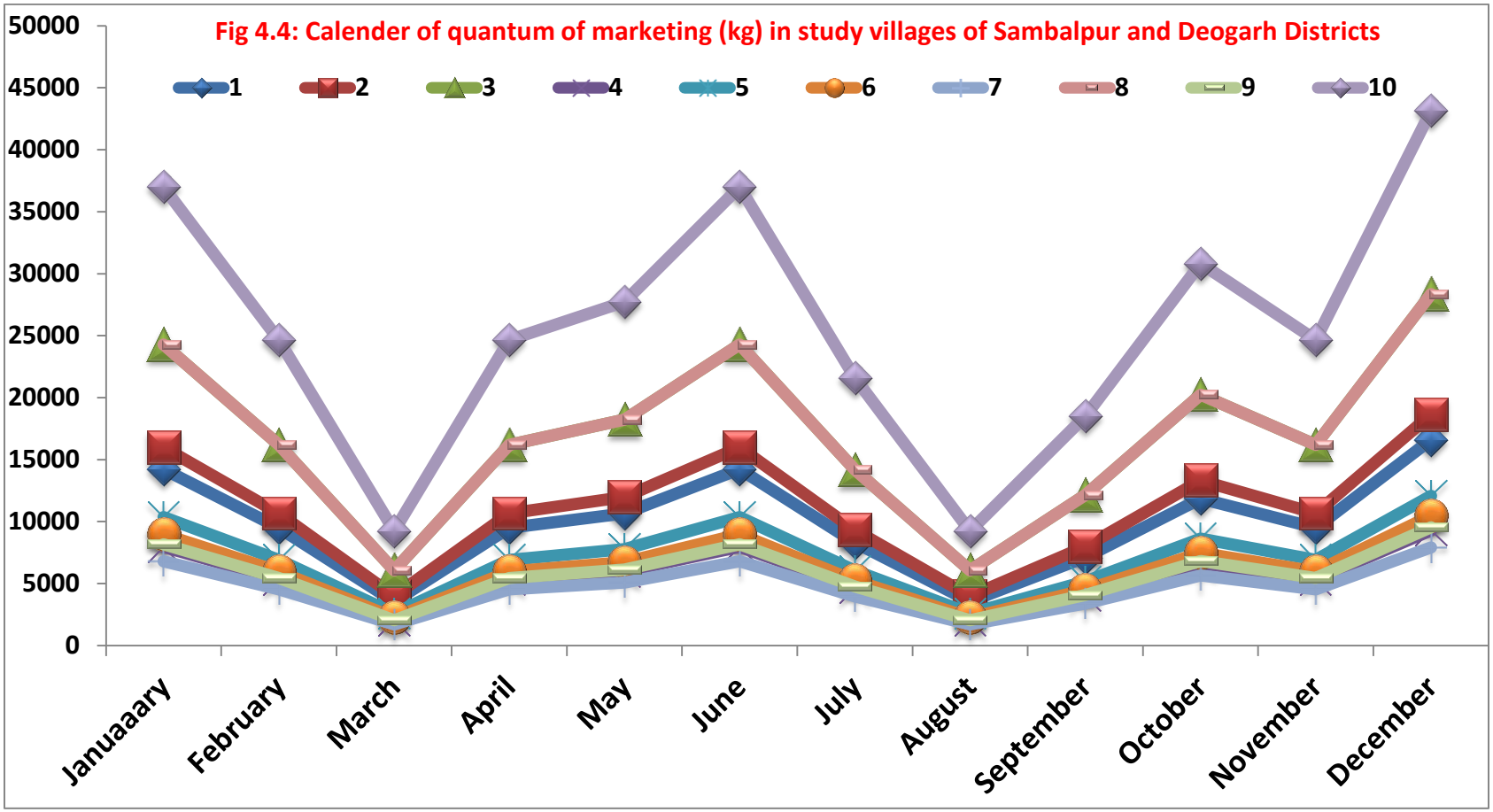
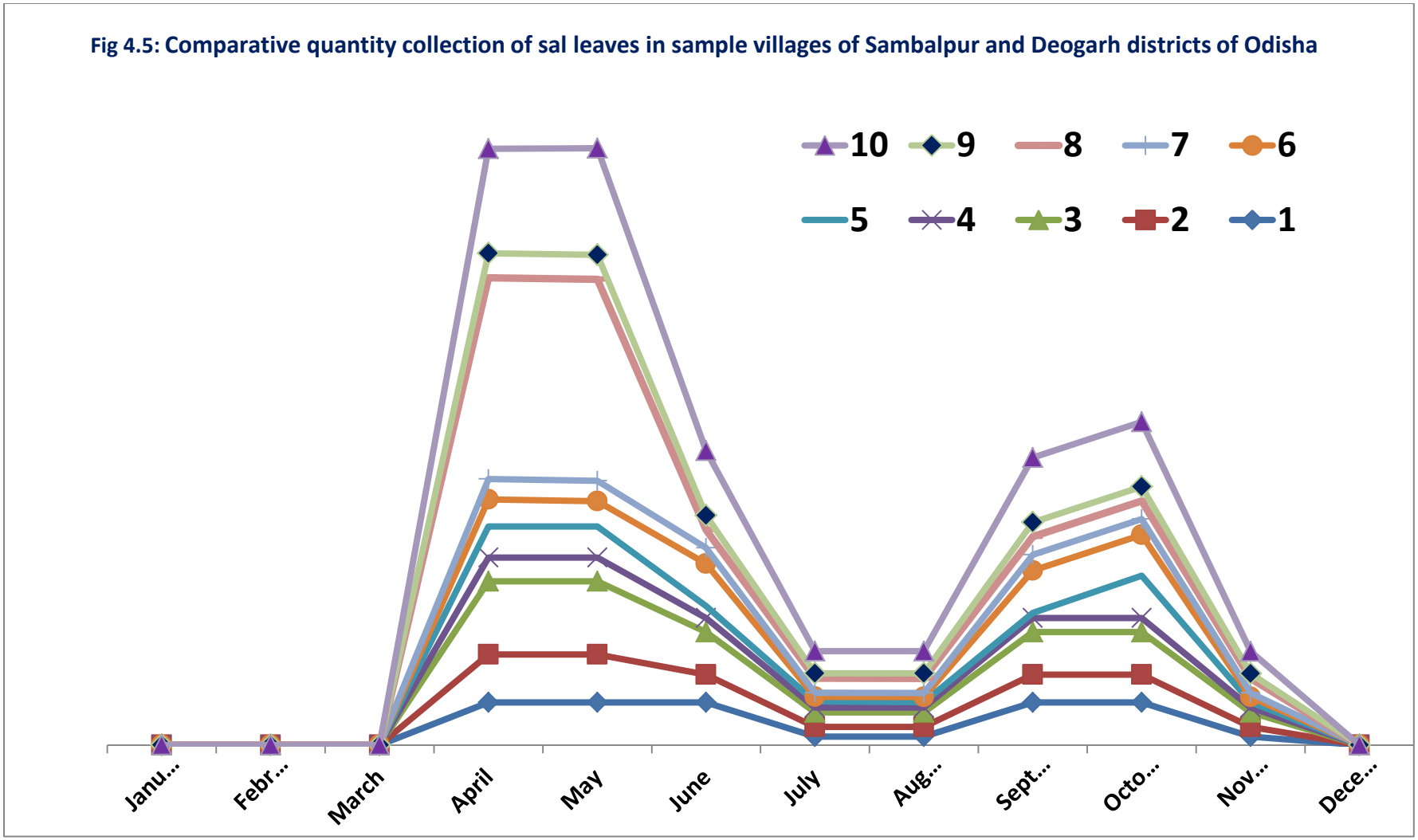


Fig 4.3: Calender of marketing of sal leaves in Sambalpur and Debgarh district of Odisha
16
14
12
10
8
6
4
2
0
Januaaary
February
March
April
May
June
July
August
September
October
November
December
Series1



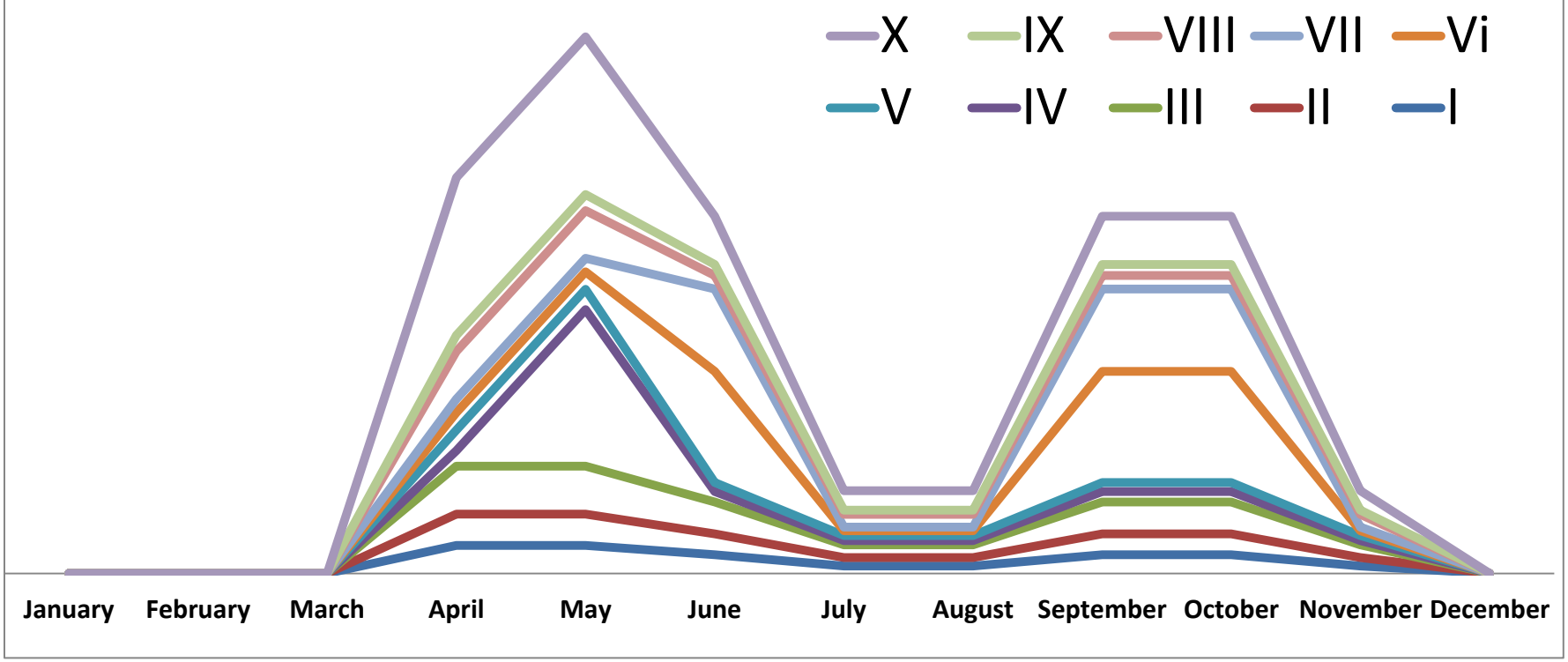
The prefixes 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 represent study villages Gaudgad, Degaon, Kansar, Dantri, Salesingh, Patlipali, Bileighanti, Kailash, Telimunda, Naulipada

Fig 4.5: Comparative quantity collection of sal leaves in sample villages of Sambalpur and Deogarh districts of Odisha



The prefixes 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 represent study villages Gaudgad, Degaon, Kansar, Dantri, Salesingh, Patlipali, Bileighanti, Kailash, Telimunda, Naulipada

Fig 4.6: Calender of wage engagement in sal leaves in collection and processing in study villages of Sambalpur and Deogarh districts

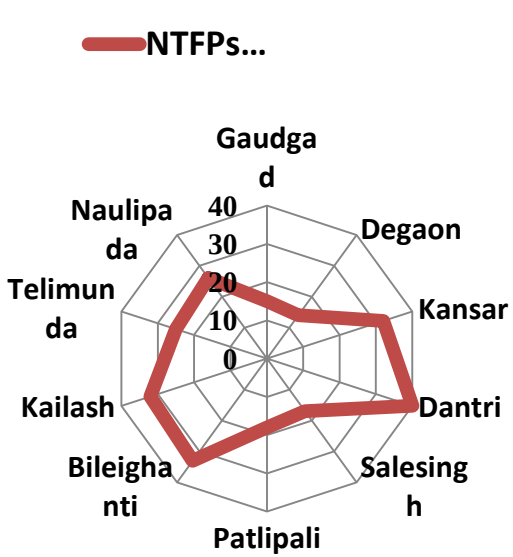


The prefixes I, II, III, IV, V, VI, VII, VIII, IX and X represent study villages Gaudgad, Degaon, Kansar, Dantri, Salesingh, Patlipali, Bileighanti, Kailash, Telimunda, Naulipada

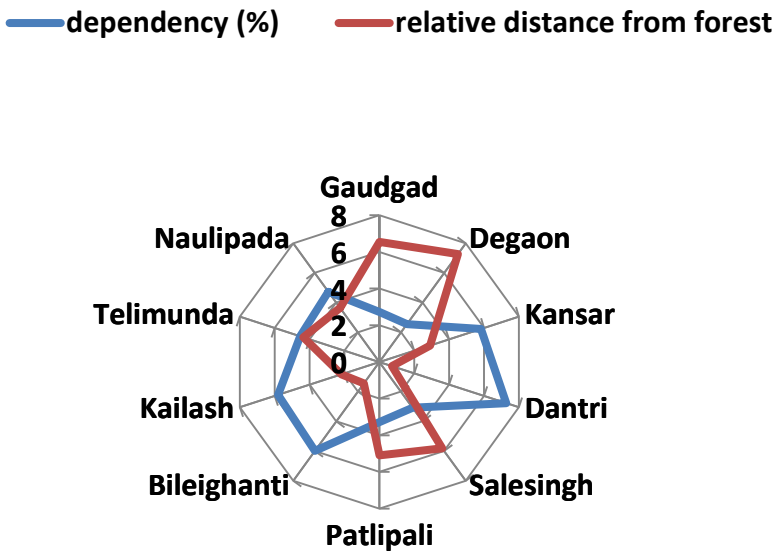
Table 4.14: Correlation Coeffitient of Forest dependence with other contributing parameters.

	Sal leaf Dependence	**Nearness to forest**	**Literacy Rate**	**Land holding**	**Distance from road**	**Sal tree density**	**Infra-structure**	**Cropping intensity**
Sal leaf Dependence	1.000	0.696	-0.139	-0.393	-0.006	0.781	-0.563	-0.006
Remarks	**	*	NS	NS	NS	**	NS	NS

Fig 4. 7: Contribution (in %) of and sal leaf on livelihood and relative distance of forests of sample villages in Sambalpur and



A. Share of (%) on livelihood



B. Sal leaf livelihood dependence and distance of forests

4.2 Marketing network and valuation of Sal leaves

4.2.1 Channel design of sal leaves

Sal leaves have a crucial role in strengthening the the economic condition of the rural poor residing in vicinity of forest. The share of in general and sal leaves in particular in their daily and annual economy has already been discussed in the previous chapters. There exist different marketing channels for disposal of sal leaves throughout the country, of which about nine channels can clearly marked in the study area. These channels has been demonstrated below in Table no 4.15. The longest intra-state channel (channel no.IV) comprising of 7 functionaries i.e Primary collector/Processing Unit, Marketing Agent, Contractor, Big Trader, Whole sellers, Retailers and final Consumer which accounts for 23.33% of the total market. The only channel (channel no.V) through which surplus product is exported to the market of other state (mainly to Raipur and Bilashpur markets) which also comprises of similar 7 functionaries accounts for only 8.27% of the market. The marketing channel holding maximum percentage (24.35%) of the market is channel no.II which is comparatively short and comprises of only 3 functionaries such as Primary collector/Processing Unit,Weekly Haat and Consumer. In this channel sometime the collector himself or his family members are engaged in marketing of the products in weekly markets. The shortest channel (channel no.I) having only two functionaries i.e. Primary collector and consumer accounts for 19.25% of the market. In this channel the consumers generally buy sal leaf products from the door step of the collectors. The use of mechanised pressing unit is notably low in the study area unlike other sal dominated area of the state. Three marketing channels i.e. channel no.III, VI and VIII include Household processing units accounting for 6.75%, 3.16% and 2.65% respectively. In rest all channels the primary collector also works as processing unit. Self consumption accounts for only 0.75%.

4.2.3 6.2 Economics of Trade

A primary collector gets a daily compensation of 100 INR, maximum for a total work of 10 hours on an average. A family of five members can stitch upto 400-600 plates in a day along with their genuine domestic activities which may fetch them maximum upto 400 INR. A man working in the pressing unit gets comparatively more than the primary collector. For 1000 pressed plates the machine operator gets 25-30 INR and for 1000 cups gets 16-22 INR. An experienced person can press 2500-3500 plates or upto

4500 cups in a day. However village level agent appointed by big traders gets a commission of 0.5 INR on 80 plates and 1 INR for 1000 cups. He earns1000-2500 INR per week. A pressing unit owner gets a compensation of 90-110 INR on every 1000 pressed plates. Incurring on expenses upto 30-45 INR , leaving a net profit of 60-65 INR per 1000 plates. A big trader gets a wider range of margin because of the because of the varied market demand and distance to the point of export.

Fig 4.8: Marketing channel of sal leaves in Sambalpur and Deogarh district.

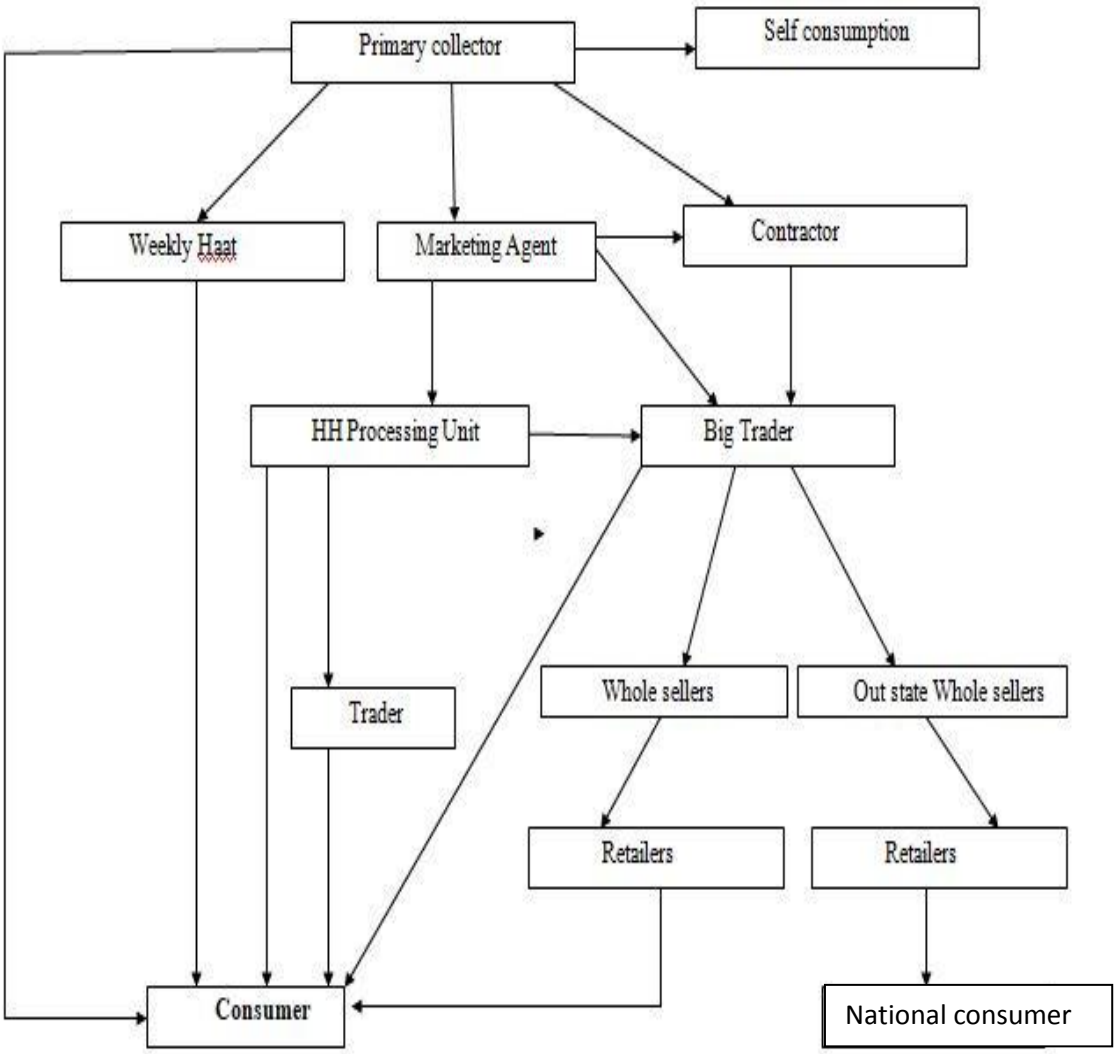


Table 4.15: Different marketing channels observed in sal leaf sector in Sambalpur and Deogarh district.

Channel no. / functionary	I	II	III	IV	V	VI	VII	VIII	IX
1st	Primary collector/ Processing Unit	Primary collector/ Processing Unit	Primary collector	Primary collector/ Processing Unit	Primary collector/ Processing Unit	Primary collector	Primary collector/ Processing Unit	Primary collector/ Processing Unit	Self consumption
2nd	Consumer	Weekly Haat	Household Processing Unit	Marketing Agent	Marketing Agent	Household Processing Unit	Marketing Agent	Household Processing Unit	
3rd		Consumer	Marketing Agent	Contractor	Contractor	Marketing Agent	Big Trader	Consumer	
4th			Trader	Big Trader	Big Trader	Consumer	Consumer		
5th			Consumer	Whole sellers	National Whole sellers				
6th				Retailers	Retailers				
7th				Consumer	Consumer				
Percentage	19.25	24.35	6.75	23.33	8.27	3.16	11.49	2.65	0.75

Table 4.16: Costing of longest and shortest Channel of Sal leaves in the sample villages of Sambalpur and Deogarh districts of Odisha.

Parameter / Functio-naries	Channel II					Channel V				
	Purchasing Price (Rs.)	Selling Price (Rs.)	Profit(Rs.)	Marketi-ng cost (Rs.)	Marging Realised(Rs)	Purchasing Price (Rs.)	Selling Price (Rs.)	Profit(Rs.)	Marketi-ng cost (Rs.)	Margin Realised(Rs)
1st	6.85/ bida	8.55/ bida	1.70 /bid a	1.2/ bida	0.50/ bida	6.85/ bida	8.55/ bida	1.70/ bida	0.43/ bida	1.27/ bida
2nd	8.55/ bida	13.85/ bida	5.3/ bida	2.85/ bida	2.45/ bida	8.55/ bida	9.67/ bida	1.12/ bida	0.37/ bida	0.75/ bida
3rd	13.85 /bida					9.67/ bida	11.22 /bida	1.55/ bida	0.73/ bida	0.82/ bida
4th						11.22/ bida	15.43 /bida	4.21/ bida	3.12/ bida	1.09/ bida
5th						15.43/ bida	17.37 /bida	1.94/ bida	0.78/ bida	1.16/ bida
6th						17.37/ bida	20.25 /bida	2.88/ bida	0.79/ bida	2.09/ bida
7th						20.25/ bida				
E	1.02					1.96				
ME	0.02					1.95				
MME	0.98					0.51				

Note : 1bida = 50 no. of sal leaf plates, 1 bundle = 1000 leaf plates

4.2.3 Costing of longest and shortest Channel of Sal leaves.

Table 4.16 provides that both long and short chain (channel no II and IV) include the same initial labour cost/ Purchasing price i.e. about Rs 6.85/bida. The marketing cost of 1st and 2nd functionaries of channel no.II is Rs 1.2/bida and Rs 2.85/bida respectively. The counsumer's price is only Rs 13.85/bida. The primary collector realizes a margin of only Rs1.2/bida where as the seller at weekly market gets 2.85/bida as margin. In channel no .IV the 1st,2nd,3rd, 4th,5th, and 6th functionaries have to pay marketing cost of Rs 0.43/bida, 0.37/bida, 0.73/bida, 3.12/bida, 0.78/bida, 0.79/bida and realize a margin of Rs 1.27/bida, 0.75/bida, 0.82/bida, 1.09/bida, 1.16/bida, 2.09/bida respectively. The consumer's price of channel no.IV is Rs 20.25/bida which is Rs 6.4 more than that of Channel no. II.

4.2.4 Processing and Marketing of sal leaves

Leaves are collected generally twice in a year . First, it starts in the month of April -June, just after winter season and before rainy season. Second season of collection starts from mid-September just after the rainy season till December and end before starting of winter. In these seasons, bigger size leaves are available; there is no problem of drying as sunlight is abundant in these seasons and the risk of leaves getting damaged by fungus or moisture due to fog is avoided. Still in some area leaf collection is carried out in rainy season and fresh khalis and Donas are sold in the market without drying. Fresh cups and plates also have a sound demand in market for instant consumption inspite of having less durability. Usually leaves after collection from forest are stitched into Khalis and Dwipatris immediately. Once the leaves are stitched into Khalis and Dwipatris, they are spread on dry ground under sun for drying. Leaves are stitched first and then dried because it is easier to stitch the soft leaves, but once it dries it is difficult to stitch the leaves and there is a risk of breaking and damaging. Juna grass and Bamboo stick are the two materials which are mainly used for stitching the leaves. But in the study area only bamboo sticks are used due to its abundance in availability and cheap rate. Collected leaves are joined together using bamboo twigs into Khalis and dwipatris, after which it is spread on a dry ground in sun or sold freshly. It takes nearly 1 day to dry up. Drying in the sun leads to folding and contraction of the leaves which is corrected by making bundles of Khalis or dwipatris and pressing it under heavy flat object like stones. Khalis and Donas are packed using Sabai ropes into a bundle bundle.

one bundle comprises of 1000 Khalis. Bidas comprising 50 pieces and Malas comprising 80 pieces are the local units for counting khalis and Donas respectively. Khalis are generally transported in a bicycle, auto rickshaw or van depending upon the volume. These vans/auto rickshaws are sent by the cum traders. Generally the traders are in regular contact with the village level agents who procure and in some cases also store Khalis on the behalf of the traders. The carrying capacity of a bicycle is 35000 Dwipatris. Heat pressing process is both done at household level with one machine or at contractual processor/processor cum trader level with machines ranging from 2-4 in numbers. Heat pressing process is both done at household level with one machine or at contractual processor/processor cum trader level with machines ranging from 2-4 in numbers. The machine for making plates cost approx. 6000/-, and cost of the machine for making donas cost approx. 4000/-. Khalis and Dwipatris are heat pressed into following products:- tray, thali, bowl ,cups. There are so many registered traders in odisha. But in the study area very less amout of mechanically pressed khali, donas are available due to shift of the processors from leaf to paper and Polystyrene due to decline in demand, discontinuous availability of sal leaves and lack of government initiatives. The processed material is either sold to national traders or sold in the domestic markets located in other states. This category of traders has direct access to outside market. With 10-12 pressing machines in each unit, the average annual turnover of a processor cum trader is around 10-15 lacs. Some of these traders also make their own pressing machines and dies. They have Tempos and small vans to collect Khalis and Dwipatris from villages and local agents.

4.3 Challenges and solution

The challenges and constraints faced by the respondents for earning issue and marketing of sal leaves as per their perception and ranking are being analysed and discussed. Individual respondent as well as community had participated in the focussed group discussion held in sample villages to understand the dynamics of market in the villages covered.

4.3.1Challenges about sal leaves in sample villages

- The primary collectors generally realise very less amount of margin with compared to retailers and whole sellers.
- In maximum cases throughout the study area, the collectors themselves are involved in processing and in some cases also in marketing. They are following

a primitive and traditional method of processing which demands more labour cost and have less production efficiency.

- The quality and quantity of sal leaf is largely affected due to inappropriate processing method. People were unaware of all the schemes which is made by Government.
- Collectors are completely unaware of Forest Right Act (FRA).
- It has been observed that, in many cases there was no such infrastructure developed and nor proper procedure followed for drying and storage of leaves, as a result of which leaves were getting damaged frequently.
- In some cases it has also been observed that consumers in particular times, for instance on the occasion of several festivals have huge demand of sal leaf products but the collectors are unable to supply large quantity of products due to poor production efficiency and primitive method of processing and high labour cost.
- No processing/ value addition is done nor promoted by government as like Kendu leaf sector.
- In most of villages studied, major population depend on sal leaves as their secondary occupation. It is very difficult to rely on this occupation as primary source of income because it requires more time and labour but generates less margin.
- Rapid shift of preference of mechanised processing units from sal leafs as raw materials to other substitutes like paper, thormocols, synthetic products etc. due to high transportation cost, discontinuous availability and decreased demand, which demoralizes the collectors to have faith on sal leafs as a reliable source of income.
- In rainy season fresh leaves are collected and sold without drying, which involves huge risk of damage.

4.3.2 Solution towards challenges

- Many government programme may be organised to aware people about sal leaf policy.
- People must be made aware about different schemes of government regarding their interest.

- OFDC needs to take profound steps in favour of sal leaf sector and control marketing channel of this sector by which the poor primary collectors would be benefited.
- Establishment of mechanized processing units for tray, plate and cup making must be done through the initiative of Government and various NGOs which would generate sufficient employment, particularly in favour of the women folk of rural and tribal area.
- Proper method of value addition must be followed.

4.3.3 Strength and Deficiencies in Marketing of sal leaves

Strength	weakness
➢ Sambalpur and Deogarh districts have good edaphic and climatic factor suitable for growth of and sal. ➢ In these two districts**,** there is agriculture base and with surplus caspacity and considerable scope for inter and intra cultivation and lot of cultivable fallow land. ➢ The study area is well connected with railways and roadways. ➢ Sal leaf products are bio degradable and eco-friendly which have the potential to satisfy the global concern of replacement of synthetic products with natural products. ➢ Leisure period can be exploited for the processing of sal leaves which generates additional income. ➢ Due to religious and cultural beliefs leaf plates and cups still have profound demand in the market in spite of introduction of various synthetic products.	➢ Primitive and traditional methods are still prevalent which demand high labour cost but generate very less income. ➢ Economy of scale is unfavourable for sal leaves. ➢ Markets are not well developed. Most of of the employment opportunities are due to to forest and agricultural sources that varies over climatic conditions. ➢ No processing/ value addition is done nor promoted by government. ➢ The quality and quantity of sal leaf is largely affected due to inappropriate processing method. ➢ People were unaware of all the schemes which is made by Government.

Opportunities	Threats
➢ Cultivation of NTFPs can fetch additional income, quality employment, scope for growth of rural economy, optimum utilisation of agriculture infrastructure. ➢ Overall economic growth especially covering rural areas is possible. ➢ Export potential lies untapped. ➢ The densely forested area in State provides opportunities for setting forest based industries. ➢ Certification to ensure better price for the produce.	➢ Fear, Ignorance, Dogma, inertia for change. ➢ Monopoly Industries may arsie as competitors. ➢ Middlemen cashing on secrecy. ➢ Risk of failure and price fall. ➢ Fear of rejection of products by the mass. ➢ Less durability of products.

DISCUSSION

The results obtained from the present investigations have been discussed under following headings.

5.1 Livelihood dependence inventories

5.1.1 Individuals education status

. The household inventory recorded illiterate category throughout the study area to be 32.72% of total number of households which was much higher than the illiteracy of both districts *i.e*. 23.00 % for Sambalpur and 27.43% for Deogarh. This deviation occurred because the sample villages were chosen on the ground of nearness to forest and potential dependency of NTFPs in general and sal leaf in particular. Almost all the sample villages were situated at the periphery of forests. In comparatively more remote villages such as Kansar, Bileighanti and Kailash, illiterateacy percentage were 52.00%, 35.00% and 33.33% respectively highest among sample villages. Nevertheless, an exception to these the remotest studied village namely Dantri had least illiteracy percentage *i.e.,* 26.67% compared to individual villages and their average. This might be attributed to the consistent efforts of missionaries who restructured the educational processes of this village. From the aforesaid fact it is clear that literacy rate decreased with increasing nearness to forests which was well proved from three villages namely, Kansar, Bileighanti and Kailash which are remotest villages and observed to be educationally backward. 60.00% of the population of Kansar village, 45.00% of Bileighanti and 44% of Kailash villages were dependent on NTFPs as source of secondary employment during lean period. Hence it could clear that forest dependency became inversely proportional to educational

5.1.2 Land holding Pattern

Analysis of household landholding information from table 2 claims maximum concentration of households (38.64%) were of landless category followed by marginal farmers (30.03%) and minimum concentration (7.57%) were of large farmers. Almost 30% of households were landless who cultivated as tenants and shared croppers of lands of medium and large farmers or encroached sometimes forests or revenue lands. Besides farming they were earning from wages both from agriculture or other sources and too rely on forests for NTFPs collection. A total of 12% households owned 86% of cultivated area in India and 2% households owned

38% of cultivated area in Punjab state which became the concern before the Royal Commission on Agriculture (Leach, *et al*., 1998) and imposing threat to economic growth as countries with more equal land distribution experience higher rates of economic growth (Deininger and Squire, 1996). Marginal and landless households in India were deprived of the advantages and opportunities of green revolution (Fan, *et al.*, 1998) though they contributed to agricultural workforce and accounted about one third of households, half of them remained below the poverty line (Agarwal, 1999). Thus, these classes of people are beyond national average who depend on allied sectors.

5.1.3 Primary and secondary occupation

Agriculture is mainstay of India which occupies 65% of working population (Samantaray, 2015) but gives only substantial gain (Anríquez and Stamoulis, 2007) to national economy. Present crisis in this sector like poor income/ high production cost and economic instability during the present days had caused farmers' propensity to go for off-farm activities to combat the risk (Evans and Ngau, 1991). There is need to cope with risk and credit market constraints (Taylor and Wyatt, 1996 and Reardon, 1997). In sub-Saharan Africa and Asia (Bryceson, 1996) and India (Chandrasekhar, 1993) there is livelihood diversification. Non-agricultural employment arises from the survival strategies of rural households mostly marginal and small farmers. The diversification of rural employment is part of positive dynamic whereby economic growth entails a shift in employment from agriculture to industry and service sectors (Ghosh and Bharadwaj, 1992). In our study area of course adequate dependency on forests, agriculture still remained as largest principal occupation which was followed by daily wages, livestock and service sector (employed or self-employed). People having NTFPs dependence for primary occupation was only 9.95%. From thorough interrogation and focused group discussions it is realized that only persons who have no alternative, usually widows and aged personnel depend on NTFPs as their primary occupation. Primary profession as agriculture and livestock each accounted less than one third of total, much below than the district, state and national average. The daily wages and employed/ self-employed households together accounted approximately equal to two fifth of total households. Further, percentage of population depending on Agriculture(29.58) as their primary occupation was less than half of the total land holders (61.36%), which indicates that some of land holders had taken agriculture as secondary occupation (7.59%) or left it by putting land fallow or

to share croppers as agriculture proved uneconomic for them. The livestock earners being much below the proportion of landless and daily wage being second primary profession, it can be understood that some landless and landholders might have opted daily wage and self employment as primary profession. In Bileighanti village percentage of agrarian population was much less than that of people engaged in livestock. More than 60% of that village are engaged in animal husbandry as both primary as well as secondary occupation. They rear cattle and dispose milk through cooperative to urban centres. The percentage of primary occupation as self employed and employed category is nearly equal to that of combined percentage of persons having qualification upto 10^{th}, 12^{th} and beyond, which implies that most people of education beyond matriculation are engaged in employed and self employed category with more or less exceptions.

All the sample villages have maximum percentage, i.e. more than two fifth of secondary employment under NTFP. Secondary employment was followed by social group having leisure hours/ days after attending primary. Further, the same day may be contributed for both the occupation like agriculture and animal husbandry. NTFPs might have been combined with any primary occupation i.e., agriculture, animal husbandry, employment/ self-employment, daily wage where no other profession becomes compatible between primary and secondary. Their collection did not need any hard nor skilled work. It becomes easy to collect without too restriction. It becomes assured source of income over the part of/ throughout a year. NTFPs accounts for approximately 40% of total official forest revenues and 55% of forest-based employment. Nearly 500 million people living in the vicinity of forests in India depend on NTFPs as a critical component for their sustenance (World Resources Institute, 1990). Apart from subsistence and income-generating potential, NTFPs also render food security to large low-income populations and their domestic animals, particularly during natural calamities like droughts or famines (FAO, 1989).

5.1.4 Duration involved in primary and secondary occupation

Primary occupation was maximally confined in the duration of 150-200days (Table.4.4) with minimum duration 100-150 days. Negligible primary occupations have the duration of less than 100 days, which doubtlessly belong to the households engaged in agricultural labour, who get employment for very less period, generally

during sowing and harvesting. Maximum percentage of primary occupation having duration less than hundred days has been recorded in Salesingh village (10.00%). People in agriculture including post-harvest operations remain engaged for 150-200 days. Maximum secondary employment is confined in the duration of less than 100 days. Firstly, maximum secondary income being NTFPs which become available upto 3 months from forests except firewood, fodder, bamboo year round availability and secondly, Secondary employment being followed mostly during leisure and lean period makes it confined in considerably less duration. However, regardless of primary or secondary employment households had to devote 250-360 days for animal husbandry. Village Bileighanti, having maximum primary occupation as livestock also has maximum percentage of duration for primary occupation of duration more than 250 days. All the sample villages follow independently to their occupations. Further, duration of forest work undertaken too different among villages. Similar types of variation was observed by Pal, 1990 when he compared duration of involvement with bamboo when three bamboo artisans villages in Birbhum district of West Bengal. He found agriculture being risky and expensive they diverted to bamboo craft profession, the third profession was wage earning. Bamboo craft engagement duration varying in three villages as 170 days, 260 days and more than 290 days.

5.1.5 Income from primary and secondary occupation

There exists a wide range of variation among the study villages regarding their income pattern from primary as well as secondary sources. As per income gradation from primary sources (Table 4.5) and $\chi^2_{0.01}$ (1 x 1), it has been observed that highest percentage of households(28.53%) have fallen in the category of 0.5-1 lakh annual income , followed by 1-1.5 lakh category, and the lowest observed with income more than 2 lakh per annum. Bileighanti (40.00%), patlipali(36.00%) has had maximum households coverage in the primary income range 0.5-1.0 lakh per annum. Kailash(44.44%) and telimunda (36.00%) were concentrated in the primary income range 1.0-1.5 lakh per annum. Proportion of households with income 1.5-2.0 lakh per annum was maximum in Naulipada (29.85%) and minimum in Bileighanti (5.00%). Households with annual income 2.0 lakh per annum from primary source were highest in Kailash (15.56%) and less in Bileighanti village (5.0%). It was observed from the interaction with respondents maximum percentage of their reliability (44.24%) was projected on NTFPs for secondary income(Table 4.6, $\chi^2_{0.01}$ 1 x 1) which

was followed by livestock (23.04%),others (16.23%) daily wages (8.90%) and agriculture (7.59%) . $\chi^2_{0.05}$ (2x 2) does not mark any significant variation of profession over the sample villages. However, NTFPs invariably claimed highest households percentage coverage as secondary income source in every sample village. Livestock was least secondary profession in Dantril (6.67%). Among the villages as secondary profession, agriculture was highest covered in Gaudgad(14.29%) and nil in Dantri village. Dantri village claimed highest (60%) dependency on NTFPs and Salesingh claimed the least (33%) as secondary source. Secondary income is dependent on prevailing environment, size, male-female proportion, age gradation of a family, duration (days and hours) availability after primary occupation, quantum of dependency, market security, volatility, benefit-cost ratio of both primary and secondary income and year round feasibility of primary occupation. Mohapatra, 2009 expressed that the contribution of agriculture and allied sources of the resources was 18.44% of total income of Odisha and 14.60% of total GDP of the country (2009-10). The majority of Secondary income is from NTFPs in present study of which maximum contribution is from sal leaves sector which is through individuals participation in Sal leaves ,tree pruning and collecting, stitching and bagging of leaves (Table). Nevertheless, the role of women rendering support for household economy through NTFPs collection, livestock activities with active involvement of community institutions viz., SHGs, JLGs, UGs, etc. lends support of increasing secondary income because of involvement of women participation in self help group and livestock rearing. Result is in line with the findings of Sundaram,2012 who reported that the implementation of SHGs (a total of 35.7 lakh in India) with diversion Rs.11, 486 crore under Swarna Rozgar and bank credit mobilization of Rs.19, 017crore might had incubated Self-employment among rural poor. These are mechanisms to combat present poverty condition of the nation as India has poverty (BPL in 2011-12: 12.4% whose daily income <$1.90) sharing 20.6% of the World (179.6 million-India / 872.3 million- World /) whereas population shares 17.5% only(World Bank Report, 2015). (Pal,1990) reported that NTFPs fetch of course less income but dependency is more and secured because over the period no other employment opportunity competes with it. It independently makes household productive and the beneficiaries can work at home during leisure hours without hampering main occupation, no special skill is needed, easy to operate, generation wise it is followed.

5.1.6 Non-Timber Forest Products availability and collection

There exists a wide range of diversity in the availability, extraction and marketing pattern of NTFPs throughout the study villages (table 4. and figure 4.1). The potential NTFPs available in the study area are, sal leaves, kendu leaves, mahua, firewood, edible bamboo shoots(karadi), siali, and fodder. Sal was most abundantly available in all villages. Kendu leaf was most abundant in Gaudgad, Degaon, Bileighanti, Telimunda and Naulipda and abundantly available in rest of the villages. Mahul was most abundantly available in all villages of Debgarh district i.e. Bileighanti, Kailash, Naulipada and Telimunda, whereas abundantly available in Gaudgad, Degaon, Dantri and Kansar but in Salesingh and Patlipali s it's availability was sporadic. Firewood was abundantly available in Dantri, Bileighanti and Kailash. It's availability is sporadic in rest all villages except Gaudgad and Deogaon where it was less abundant. Edible bamboo shoot (karadi) was abundant in Kansar and Dantri villages whereas it's availability was sporadic in Bileighanti and Kailash but it was less abundant in rest all villages. Tamarind was abundantly available in Gaudgad, Dantri, Bileighanti and Salesingh. It's availability was sporadic in Degaon , kansar and Patlipali, whereas it was less abundant in Kailash, Naulipada and Telimunda. Fodder was abundantly available in almost all villages. Siali was not available in Sambalpur District but abundantly available in Kailash and Bileighanti villages of Debgad district. It's availability was sporadic in Telimunda and Naulipada. NTFPs were sold on the following prices. i.e sal Rs 30/kg, mahua Rs 20/kg, Tamarind Rs 35/ kg, Firewood Rs 4/kg, Chironji Rs 90/kg, Karadi Rs 40-60/kg and fodder Rs 10/kg. The people of all the villages sold surplus mahua in local bhati after own consumption. Sal leaves after plate making locally sold in hat and sold to agents of traders. The Price of sal varied from Rs 11 to 15 / bida in lean season where as it was Rs 10 in peak season. The price of Chironji and Firewood remained the same regardless of peak or lean season i.e. Rs 90/kg and Rs 4/kg respectively. The price variability of siali was almost the same with sal. The price of tamarind was Rs 35/kg in lean season and Rs 30/kg at peak season. Interesting fact is that the price of all other products diminishes in peak period and increases in lean season but that of karadi was vice versa of this phenomenon. The reason behind this is that there is a high demand of fresh and good quality karadi, which is available in peak season only. Among all NTFPs available in sample villages karadi has most wide price variation

between lean season (40/kg) and peak season (60/kg). Sal is collected during April, may and june and September ,October, Mahua is collected in April , May and June, Tamarind is available in May and June, Chironji is available in April-May, Karadi is collected in July, August and September whereas firewood and fodder are collected year around. The result in line with the finding of Sahu *et al.,* 2007 who recorded that most of the NTFPs were available for three to four months. Choudhury, 2007 reported that mostly Scheduled Caste and Scheduled Tribe communities of Odisha were landless or marginal farmers who depend on forests for subsistence and much needed cash during the lean summer months. About 275 million Indian poor rural people, rely on NTFPs for at least fraction of their subsistence and cash livelihoods (Pandey *et.al*, 2016).

5.1.7 Production and revenue generation from Sal leaves

NTFP is facing much yield loss, which might be due to various reasons such as less and erratic monsoon shower, use of unskilled labour on the fields, lack of proper plant protection measures at both pre and post-harvest stages etc. Still, non-timber forest products (NTFPs), such as medicinal and aromatic plants, leaves, fruits, seeds, resins, gums, bamboos, and canes, offer employment that provides up to half the income of about 25 per cent of the country's rural labour force (Rasul *et.al*, 2008). Mostly widows, aged, unmarried women and moribund classes are involved in collection and processing of most of NTFPs. The lowest daily revenue from NTFPs was usually earned by part-time collectors with low socio-economic status such as migrants, forest-dwellers or those without access to agricultural land.(Mac Millan and Gubbi, 2008). The Processing unit of sal leaf includes various activities like stitching, drying, pressing etc. which are solely run by women . This provides them an opportunity to exploit their leisure times and thereby generate some income, which in turn making them more or less self sustained. However, the more involvement of voluntary organisation like non-government organisations for organising awareness programme to conserve the forests including Sal leaves and other NTFPs with revitalising their natural stands. Sal leaf is a major source of income for forest dwellers in Orissa. Primary level processing like cup and plate making provides livelihood security to hundreds and thousands of forest dwellers (Nayak,2015).

4.1.11 Sector wise employment and income generation per annum from sal leaf.

Table no. 4.12 showed that, total earning from sal leaves was highest with 64.7 lakh in Naulipada which was followed by Kansar (42.52 lakh), Kailash (42.51lakh), Degaon (27.9 lakh), Gaudgad (24.8 lakh), Salesingh (18.13 lakh), Patlipali (15.7 lakh) Telimunda (14.3 lakh) and the least was in Dantari (13.9 lakh). Following the similar pattern Table no. 4.12 provides that, total number of man days was highest with 81120 in Naulipada which was followed by Kansar (53281), Kailash (53280), Degaon (53080), Gaudgad (31200), Salesingh (22700), Patlipali (19680) Telimunda (17920) and the least was in Dantari. On an average an individual collector collects 607 Kg 875 g. The calendar of collection however not uniform year round, because in the peak period i.e. April to mid June, September and October provides good quantum of leaves with efficiency much more. On the other hand the lean period i.e. July, August and November provides poor collection with less efficiency. No village was observed to involve males in Processing sector (stitching, drying, binding). In rainy season, it is difficult to access to to deep forest ares due to rain fall and heavy infestation with weeds. There is also danger of snake bite. Apart from this in rainy season collected leaves are prone to the risk of damage by fungus and moisture as there is no scope of sun drying. But some collectors, generally those who solely rely on sal leaves for their bread and butter, collect leaves even in rainy season i.e. July and August and sell them without drying after stitching. In winter i.e December to January, senescence occurs and the leaves become matured, which is not suitable for cup plate making. After winter in springs, leaf falling takes place till mid March. New leaves start to emerge in April. In collection sector involvement of males is considerably low. Males engaged in cattle and other animal rearing generally collected some leaves during in the way to lead the cattle to forest for grazing. In processing sector Only women are observed to be involved. No males are engaged in processing of leaves i.e. stitching,drying and binding, in any villages. The social dogma that stitching of leaves is a womanly job, might be the reason behind this observation. Males earned more income in collection sector while females earned more in processing sector. Males from age group 50 to 75 and females from age group 25 to 30 earned more income from sal leaves.

4.1.12 Calender of quantum of marketing (kg), wage engagement and quantity collection of sal leaves in sample villages of Sambalpur and Deogarh Districts.

It has been observed from the market scenario of sal leaves in the study area that marketing of sal leaves was highest in December (14%), followed by june (13%) , then in January (12%) and the least was in March and August (3%) (Fig.4.3). But). Quantity of sal leaves collected was highest in April and May, followed by October, least in July and August and almost nil in December to March. wage engagement in collection and processing of sal leaves was highest in May, followed by June, September and October, least in July and August but almost nil in December to March. Marketing of sal leaf products is more prominent in December and January because these months being Picnic season, there is a high demand for cup and plates in the market. Similarly June being the marriage season attracts much demand for sal leaf products. In August and September due to heavy rainfall, the leaf products generally acquire moisture and infected by fungus. Therefore the demand for sal leaf products declines. Best time for Leaf collection comes twice in a year. First, it starts in the month of April -June, just after winter season and before rainy season. Second time it starts from mid September just after the rainy season till December and end before winter. In rainy season collection of sal leaf is very less because there is no scope for drying and high risk of fungus infestation. In winter season the leaves become over matured and unsuitable for plate and cup making.

5.1.9 Correlation of Forest dependence with other Parameters

Sal leaf dependency has been observed to be positively and significantly correlated with nearness to forest that means, in remote villages people are more dependent on sal leaves. Literacy rate, land holding, , cropping pattern and infrastructure are negatively correlated with sal leaf dependency but not significant which suggests they have very less effect on sal leaf dependency. Sal leaf dependency is positively and most significantly correlated with sal tree density. From this it is obvious that in villages of high sal tree density people depend more on sal leaves for their sustenance. Distance from road is positively but not significantly correlated with sal leaf density which indicates distance from road does not affect the dependency of the villagers on the forest for their livelihood.

5.2 Marketing assessment

It has been observed that processing of sal leaves includes leaf plucking, stitching, drying. binding and marketing with huge wages engagement utilizes the leisure period resulting in considerable amount of additional income. These activities improves the quality of leaf products and enhance the marketability. In the study areas the aforesaid series of operations were carried out in a very classical way without following innovation. Similar observations has been also studied by earlier researchers (Vasundhara,2001, Nayak,2015). Best time for Leaf collection comes twice in a year. First, it starts in the month of April -June, just after winter season and before rainy season. Second time it starts from mid September just after the rainy season till December and end before winter. In rainy season the leaves are generally immature and sun drying is impossible which threats the durability of products. There is also the risk of leaves getting affected by fungus or moisture due to fog. Still in some part of the study area leaves collected even in July, August and September and sold at fresh condition. Fresh cups and plates also has a sound demand for instant consumption regardless of it's durability. Leaves are stitched into Khalis and Dwipatris immediately after collection of leaves from forest. Once the leaves are stitched into Khalis and Dwipatris, they are spread on dry ground under sun for drying. Leaves are dried after stitching because it is easier to stitch the soft leaves, but once it dries it is trobulesome to stitch the leaves; there is a risk of breaking or getting damaged. Juna grass (*Koeleria macrantha*) and Bamboo stick are the two materials which are mainly used for stitching the leaves. But due to abundance of bamboo in the study area they are stitched by bamboo sticks generally. Collected leaves are blend together using bamboo twigs or Juna grass into Khalis and donas, after which it is spread on a dry ground under sun. It takes 1 day to dry. Drying in the sun leads to folding and contraction of the leaves which is corrected by arranging them in bundles of Khalis or donas and pressing it under heavy flat object like stones. Khalis and Donas are packed using bamboo ropes into a bundle . one bundle comprises of 1000 Khalis. Bidas comprising 50 pieces and Malas comprising 80 pieces are the local units for counting khalis and Donas respectively. Khalis are generally transported in a bicycle, auto rickshaw or van depending upon the volume. These vans/auto rickshaws are sent by the cum traders. Generally the traders are in regular contact with the village level agents who procure and in some cases also store Khalis on behalf of the traders. The carrying capacity of a bicycle is 35000 Dwipatris.

Heat pressing process is both done at household level with one machine or at contractual processor/processor cum trader level with machines ranging from 2-4 in numbers. Heat pressing process is both done at household level with one machine or at contractual processor/processor cum trader level with machines ranging from 2-4 in numbers. The machine for making plates cost approx. 6000/-, and cost of the machine for making donas cost approx. 4000/-. Khalis and Dwipatris are heat pressed into products like tray, thali, bowl ,cups. There are so many registered traders in odisha. But in the study area very less amout of mechanically pressed khali, donas are available. From investigation and interrogation it was observed that the processing units which earlier involved with heat pressing of sal leaves gradually substituted the raw material with paper and thermocols. This replacement might be caused due to three main reasons. Firstly low demand of sal leaf products in the market, secondly discontinuous/ seasonal availability of leaves, and thirdly easy and cheap availability of paper and other substitutes. Apart from this, another main reason for substitution of sal leaves is non availability of infrastructural facilities like electricity and low cost technologies in forest area, for which most of the pressing units are situated in urban area which increases the transport cost. This observation comes in line with the argument of another researchers. In the absence of electricity and low cost technology for pressing the leaves into cups at the village level, most of the processing takes place in urban centres (Nayak, 2015). The processed material is either sold to national traders or sold in the domestic markets located in other states. This category of traders has direct access to outside market. With 10-12 pressing machines in each unit, the average annual turnover of a processor cum trader is around 10-15 lacs. Some of these traders also make their own pressing machines. They have Tempos and small vans to collect Khalis and Dwipatris from villages and local agents.

5.2.2 Value addition

It has been observed that there was no value addition of Sal leaves in the studied villages except the one followed at producer's level in case of mechanical pressing which Includes drying, mechanical pressing and bagging to increase quality of products and fetch better marketability over the grades. Earlier researchers (Islam et al 2015) have estimated that, Value addition by mechanized pressing of raw Sal leaf plates can enhance return by 24100/ household/ yr (96.40 %) and employment by 50 mandays/ household/ yr (12.50 %). Therefore, it may be a vital intervention to

accelerate forest resources based livelihood diversifications, promotion and development. In Mayurbhanj district of Odisha, where sal leaf plate trade has undergone quite development and earrned considerable recognition, small value addition like stitching the Khalis and Dwipatris using machine, use of foiled paper to make the product leak proof has been introduced (Singh, 2012). But in spite of having considerable potential, mechanical pressing units are rare in the study area and there is no question of further value edition.

5.2.3 Marketing network and valuation of Sal leaves

There exist many networks/ channels through which Sal leaf product is reached to the final consumer throughout the country. However in the study area, nine pattern of channels have been observed to be clearly visible which have already been described in table no.4. The longest intra-state channel (channel no.IV) comprising of 7 functionaries i.e. Primary collector/Processing Unit, Marketing Agent, Contractor, Big Trader, Whole sellers, Retailers and final Consumer which accounts for 23.33% of the total market. The only channel (channel no.V) through which surplus product is exported to the market of other state (mainly to Raipur and Bilashpur markets) which also comprises of similar 7 functionaries accounts for only 8.27% of the market. The marketing channel holding maximum percentage (24.35%) of the market is channel no.II which is comparatively short and comprises of only 3 functionaries such as Primary collector/Processing Unit, Weekly Haat and Consumer. In this channel sometime the collector himself or his family members are engaged in marketing of the products in weekly markets. The shortest channel (channel no.I) having only two functionaries i.e. Primary collector and consumer accounts for 19.25% of the market. The consumers collect products from neighbour villages during special occasions like marriage ceremony with prior order. The use of mechanised pressing unit is notably low in the study area unlike other sal dominated area of the state. Three marketing channels i.e. channel no.III, VI and VIII include Household processing units accounting for 6.75%, 3.16% and 2.65% respectively. In rest all channels the primary collector also works as processing unit. Self consumption accounts for only 0.75%. A primary collector earns a compensation of Rs 30-35per day, maximum total work of 10 hours of total work on an average. A family of five members can stitch upto 400-600 plates in a day along with their genuine domestic activities which may fetch them maximum upto Rs-30(Vasundhara,2001).

5.2.4 Channel costing

Channel costing and price spread of the marketing channels can easily be understood by comparison of long and short channels. In table no.4.16 the longest interstate channel is channel no II where as the shortest channel is channel no II. Both long and short chain (channel no II and IV) include the same initial labour cost/ Purchasing price i.e. about Rs 6.85/bida. The marketing cost of 1st and 2nd functionaries of channel no.II is Rs 1.2/bida and Rs 2.85/bida respectively. The counsumer's price is only Rs 13.85/bida. The primary collector realizes a margin of only Rs1.2/bida where as the seller at weekly market gets 2.85/bida as margin. In channel no .IV the 1st,2nd,3rd, 4th,5th, and 6th functionaries have to pay marketing cost of Rs 0.43/bida, 0.37/bida, 0.73/bida, 3.12/bida, 0.78/bida, 0.79/bida and realize a margin of Rs 1.27/bida, 0.75/bida, 0.82/bida, 1.09/bida, 1.16/bida, 2.09/bida respectively. From the above data it is clear that there is a huge variation in the channel costing and consumer price between the two channels. The consumer's price of channel no.IV is Rs 20.25/bida which is Rs 6.4 more than that of Channel no. II. This is due to the profit sharing of marketing functionaries. It has also been observed that the primary collectors realiset very less amount of margin with compared to the wholesellers and retailers, who get highest margin.

5.2.5 Taxation for Sal leaves trade

(Gupta and Guleria, 2005) showed that the quantum of profit share diverted for village panchayat of Sal leaves may be less than 50% as announced by policy. Earlier, these plates were exempt from Value Added Tax or exercise tax in the state; only a royalty of Rs 72 per quintal of leaves was to be given to the forest department (Kukreti, 2017). But these goods are projected to tax at 18% under Good and Services Tax (GST). As these products are eco-friendly and in the interest of tribal people, state Finance minister Shashi Bhushan Behera demanded the exemption of this tax by writing a letter to the Finance minister of Union. (Odisha Sun Times, 2017).

5.2.6Expenses break up of money and Sale proceeds

Expenses break up of money of Sal leaves production includes collection, processing, binding and bagging, transportation, , enforcing expense, entry tax, etc, had been documented in Table 4.10, which provides information that processing claims higher share i.e. 35.58% followed by labour cost of collection (25.75%), then transportation (20.10%) and then Binding/ Bagging (18.57%). enforcing expense and entry tax have negligible share i.e. 0.4 % and 0.7% respectively. It should also be

noted that in case of some short marketing channels transportation may share very less expense percentage.

5.3 Challenges and solution

As far as Sal leaf sector is concerned, the biggest problem is the non remunerative return to the primary collector. Multi tired market channels, high transportation cost and inaccessibility of primary collectors to final consumers may be the factors responsible for this problem (Vasundhara,2001). In maximum cases throughout the study area, the collectors themselves are involved in processing and in some cases also in marketing. They are following a primitive and traditional method of processing which demands more labour cost and have less production efficiency. The quality and quantity of sal leaf is largely affected due to inappropriate processing method. People were unaware of all the schemes which is made by Government. Another big problem is that the Collectors are completely unaware of the rights and concessions likely to be enjoyed by them as provided by Forest Right Act (FRA). It has been observed that, in many cases there was no such infrastructure developed and nor proper procedure followed for drying and storage of leaves, as a result of which leaves were getting damaged frequently. In some cases it has also been observed that consumers in particular times, for instance on the occasion of several festivals have huge demand of sal leaf products but the collectors are unable to supply large quantity of products due to poor production efficiency and primitive method of processing and high labour cost. Forther it is a unfortunate truth that No processing/ value addition is done nor promoted by government as like Kendu leaf sector. In most of villages studied, major population depend on sal leaves as their secondary occupation. It is very difficult to rely on this occupation as primary source of income because it requires more time and labour but generates less margin. Rapid shift of preference of mechanised processing units from sal leafs as raw materials to other substitutes like paper, thormocols, synthetic products etc. due to high transportation cost, discontinuous availability and decreased demand, which demoralizes the collectors to have faith on sal leafs as a reliable source of income. Further In rainy season fresh leaves are collected and sold without drying, which involves huge risk of damage. Previous researchers also marked out various problems in this trade. Singh,2012 opined that People have a perception towards sal leaf products as a raw material to make cups and plates which has the limitations that it can be used only once and thus there is not much of development done in terms of

Design as well as Technology. Hence there is huge scope of design intervention and product development.

To bring out a solution to these problems, followings suggestions might be taken into consideration. Government programmes must be organised to aware people about sal leaf policy. People must be made aware about different schemes formulated by government regarding their interest. Nayak, 2015 suggests that, the government should encourage in giving subsidy to those who are making the said business. OFDC needs to take profound steps in favour of sal leaf sector and control marketing channel of this sector by which the poor primary collectors would be benefited. Establishment of mechanized processing units for tray, plate and cup making must be done through the initiative of Government and various NGOs which would generate sufficient employment, particularly in favour of the women folk of rural and tribal area. Proper method of value addition must be followed. Generally only women are involved in leaf plate making in the family but as it has been considered as a family business, all family members should get involved in the business one way or other, so that the social misconception about this business that, leaf plate making is a womanly job will be vanished resulting in more iuncome generation as well as partial contribution to social reformative measures like gender equality. The practice of making leaf plates still run through a traditional pattern which must be upgrade or increase as per the demand in the market which would increase the income of the poor rural communities. Lastly, the rural as well as urban mass should appeal their own conscience to avoid synthetic products as much as possible and adopt biodegradable products, particularly leaf cups and leaf plates by which the the poor mass would get their livelihood as well as environmental stability would be maintained.

SUMMARY AND CONCLUSION

Sal tree has taken dominant position in Indian forests and Indians sentiments because of its multifarious contribution; from timber, tasar cocoon, oleoresin and leaf palatable fodder to trencher or eating plates. The occupation of those disadvantaged and moribund classes of society confronting with challenges of market threat on sal leaf trade by paper, china clay, thermocol or poly styrene (polymer of C_8H_8) is resulting in social transformation out of this age old occupation. Thus, it is high time to quatify this man-forest and market convergence and find out possible ways to revitalize this sector for tribal subsistence. Keeping these objectives in view an investigations entitled "Livelihood dependence and marketing of sal leaves in Sambalpur and Deogarh district of Odisha." was carried out with 10 villages, two of which per individual block were studied based on purposive sampling. Households interview was made based on random sampling out of sal leaf plucking households with intensity 20-30 %. Primary data collection was made as per the interview schedule from the households and secondary data collected from government reports. Data were subjected to statistical analysis (χ^2 and descriptive statistics) for valid conclusion. The results obtained out of the present investigations have been summarized to express under following headings.

6.1 Livelihood dependence inventories

Among literacy and illiteracy classes over study area maximum percentage of people belonged to illiterate class (32.72%), followed by primary education (27.23%). Significant difference among population over education level ($\chi^2_{0.01}$) whereas village had independent effect of villages over education level ($\chi^2_{0.05}$ 2 x 2) were observed. Highest percentage of literates have been recorded from Telimunda (76%) and lowest from Kansar (48%). $\chi^2_{0.01}$ (1 x 1) revealed that there was no uniformity among landholders over the study area. Maximum people were of landless class (38.64%) followed by marginal farmers (30.03%), whereas minimum belonged to large lnd holdings (7.57%). The maximum and minimum households were respectively observed under the categories landless (Dantri: 46.67%, Naulipada: 29.85%), marginal farmers (Naulipada: 29.6%, Kansar : 20.00%).

Households primary occupation population size ($\chi^2_{0.01}$ 1 x 1) varying with agriculture (29.58%) followed by others (services, self-employed) (22.5%) then daily

wage (21.20%), livestock (17.02%) and the least on NTFPs (9.95%). However, the highest agricultural dependence for main income was recorded in Patlipali (44.00%) and the lowest in Telimunda (16%). Bileighanti claimed the highest livestock dependency (35%). Highest dependence on NTFPs as primary source of income was claimed by Kansar (12%). For all the villages highest secondary occupation was NTFPs (44.24%) significantly varying ($\chi^2_{0.01}$ 1 x 1) over agriculture, livestock, daily wages and others. Highest reliance on NTFPs as secondary source was recorded in Dantri (60.00%). Population size varying over duration of primary occupation ($\chi^2_{0.01}$ 1 x 1) in pooled data, but not affected by the villages ($\chi^2_{0.05}$ 2 x 2). Similar trend observed for duration secondary occupation.

Among households variation of population over income ($\chi^2_{0.01}$ 1 x 1) was observed whereas villages behaved independently over primary income ($\chi^2_{0.05}$ 2 x 2). Similar trend was marked for income from secondary occupation. Population density maximum (28.53%) over income range 0.5-1.0 lakh and minimum (9.95%) over income >2.0 lakh. Comparing villages income range 0.5 -1.0 lakh maximum density (40.00%) and minimum (15.56%) were observed in Bileighanti and Kailash respectively. Kailash was observed having maximum percentage of more than 2lakh income group (15.56%) and Bileighanti was having minimum (5.00%). Maximum no of households realized annual secondary income Rs.10,000-15,000 (27.75%) and minimum less than 1000 (10.21%). Villages were having maximum percentage of households in income group 10000-15000 was Naulipada (37.31%), and the least was at Gaudgad (14.29%).

6.2 Assessment of marketing

It has been observed that processing of sal leaves includes leaf plucking, stitching, drying, binding and marketing with huge wages engagement utilizes the leisure period resulting in considerable amount of additional income. The processing section, in many cases solely run by women. In the study area the above series of operations were carried out in a traditional way without following innovation. Throughout the study area, mostly hand stitching is followed for khali and dona preparation. Occurrence of mechanical processing unit has been observed to be rare throughout the study area. A primary collector gets a daily remuneration of Rs. 30-35, maximum for a total work of 10 hours on an average. A family of five members can stitch upto 400-600 plates in a day along with their genuine domestic activities which may fetch them maximum upto Rs.30. In the study area, nine pattern of marketing channels have been observed to be clearly visible. The marketing channel holding maximum percentage (24.35%) of the

market comprises of 3 functionaries such as Primary collector/Processing Unit, Weekly Haat and Consumer. The longest channel (channel no.IV) comprising of 7 functionaries i.e. Primary collector/Processing Unit, Marketing Agent, Contractor, Big Trader, Whole sellers, Retailers and final Consumer. It was also observed that there is a huge variation (Rs 6.4) between the consumer's price of long channel to that of short channel. It has also been observed that the primary collectors realize very less amount of margin with compared to the wholesalers and retailers, who get highest margin.

6.3 Problems and solution

The primary collectors generally realize very less amount of margin with compared to retailers and whole sellers. Further in most cases, a outdated and primitive method of processing is being followed. No processing/ value addition is done nor promoted by the government. Another main issue is Rapid shift of preference of mechanised processing units from sal leafs as raw materials to other substitutes like paper, thormocols, synthetic products etc.

People must be aware of different schemes launched by government regarding their interest. OFDC or any other government agency should take key for sal leaf marketing and regulate channels. Government and various NGOs invariably to take initiative to establish mechanized processing units by which a large no of employment can be generated. People should be made aware to prefer leaf plates over non-degradable synthetic products.

Conclusion

Forests are the lungs of our land to provide unlimited kindness and benevolence to extend the generosity for human's sustenance. The bondage between man and forest for sustenance is nature's facet. Sal, the soul of our forest is revered for its diversity of services for man-kind. This is high time to protect this species along with its dependence. Odisha located in eastern coast of Indian peninsula having plenty of invaluable natural resources, one of which is rich and dense forest cover. Sambalpur and Deogarh districts situated in western part of the state have a major portion of their total geographical area under forest cover. The fringe forest communities usually being landless or marginal land holders fail to earn for their subsistence from principal occupation for which for forest resources provide substantial gain of which sal leaf possesses dominance. This sector rendered climate resilience, secured, time bound and secondary livelihood option for deprived classes of the society. The results obtained out of present study may provide followings conclusions :

- The pluckers were mostly illiterate, landless or marginal farmers belonging to deprived and moribund classes claiming 60-70% of households of forest peripheral villages having annual earning of Rs. 50,000-60,000 of which major income sectors were wage earning, livestock or shared cropping.
- The availability of sal leaves generally limited to four moths i.e April, May, October and November. Sal leaf collection and processing provided a maximum Rs 10,000- 12000 per annum to the plucker.
- Due to multi tired market channels, high transportation cost and inaccessibility of primary collectors to final consumers, the return realized by the collector is very insignificant.
- Throughout the study area, a primitive and traditional method of processing was followed which fetched low income and have less production efficiency.
- The processing units were replacing sal leaves with other synthetic substitutes (paper, polysterene plates, etc.) due to high transportation cost, discontinuous availability and decreased demand.
- In sal leaf sector, participation of women folk is considerably high than that of males and the processing of leaves (stitching and drying) is solely run by women.

Keeping all the problems into account there must be massive campaign to discourage thermocol or styrofoam or foam plates as these are made up of polymer of styrene (C_8H_8)n) analogous to poly ethylene ((C2H4)n) having many residual effects, New York has banned (1st July BBC: https://www.bbc.com/news/magazine-33334994) we too discourage in the light of UN's slogan "beat plastic pollution" in 5th June, 2018. Facility, finance, insurance, market and institutional linkage may be provided to reach ovearseas this material which will be revitalized.

REFERENCES

Abwe MD, Ebia RN, Ewane DE, Mesue CA, Ntonifer Z, Nzohngandembou GW, Tangwa M, Vandorp A and Offermans D. 1999. The wealth of forests in Cameroon.Limbe, Cameroon: CERUT and aid environment.-E//rn news 32, Agricultural Sciences, Bangalore.

Afzal M.1997. economics and feasibility of Bamboo cultivation on farm lands, *Pakisthan Journal of Forestry*, 47 (4): 89-96.

Agarwal B. 1998. Disinherited peasants, disadvantaged workers: a gender perspective on landand livelihood. *Economic and Political Weekly* Mar, 28 (A): 2-14.

Ahenkan A and Boon E. 2010. Commercialization of non-timber forest products in Ghana: Processing, packaging and marketing, *Journal of Food, Agriculture& Environment*, 8 (2): 962-969.

Ahmed MU, Jana SK and Roy SD.2016. Marketing of non-timber forest products – a study in paschimmedinpur district in west bengal, India,*Intercontinental journal of marketing research review*, 5(3): 2321-2346.

Albert A and Emmanuel B. 2010. Assessing the Impact of Forest Policies and Strategies on Promoting the Development of Non-Timber Forest Products in Ghana, *Journal of Biodiversity*, 1 (2): 85-102.

Albert A and Emmanuel B. 2011. Non-Timber Forest Products (NTFPs):Clearing the Confusion in Semantics, *Journal of Human Ecology*, 33(1): 1-9.

Alibaba M, Subbarao DV and Vasudev N. 2000. Economics of minor forest products in Adilabad district (Andhra Pradesh), *Indian Journal of AgriculturalEconomics*, 55(3): 451-452.

Aluko M A O. 2004. Sustainable Development, Environmental Degradation and the Entrenchment of Poverty in the Niger Delta of Nigeria,*Journal of Human Ecology: International, Interdisciplinary Journal ofMan-Environment Relationship,*15(1), 63-68.

Andel T V. 2006. Non-timber forest products the value of wild plants,Agrodok 39 p38.

Anríquez G andStamoulis K. 2007. Rural development and poverty reduction: is agriculture still the key? *Journal of Agricultural and Development Economics*, 4(1): 5-46.

Appaswamy, Paula P. 1992. Role of non-timber forest products in an interface forest project. Paper presented at the workshop on methods for social science research on NTFPs, May 18-20, Bangkok, Thailand.

Arun KC. 2004.Extraction of NTFPs from the Community Forest: Analysis ofBenefit Distribution Pattern in Household Level,*Journal of Forest and Livelihood,* 4 (1): 302-316.

Baboo R. 2016.A Study on Plant Product Extraction and Indian Economy.*International Journal of Innovative Research in Science, Engineering and Technology,* 5(1): 78-84.

Baldwin J R and Dixon J. 2008. Infrastructure Capital: What is it? Where is it? How much of it is there? Canadian Productivity Review. No 16. Ottawa: Statistics Canada.

Bandiera O,Buehren N, Markus R B,Selim Imran G and SulaimanM. 2015. Women's economic empowerment in action: Evidence from a randomized control trial in Africa employment Working Paper No. 187.

Bardhan P and Dayton J. 2000..Heterogeneity and Commons Management.Berkeley, USA: University of California.

Bauri T, Palit D and Mukherjee A. 2013.Livelihood dependency of rural people utilizing non-timber forest product (NTFPs) in a moist deciduous forest zone, west Bengal, India,*International Journal of Advanced Research*, 3(4), 1030-1040.

Behera M. 2009. Non-timber forest Products and Tribal Livelihood - a Study from Kandhamal District of Orissa, *Indian Forester,* 135(8):1127-1134.

Berry S 1989.Coping with Confusion: African Farmers' Responses to Economic Instabilityin the 1970s and 1980s, Boston: African Studies Centre, Boston University.

Bhaskaran A. 2006.A study of scheduled tribe co-operative societies in wayanad district performance, problems and prospects.

Bhat SA and Tiwari SC. 2011.Indigenous Knowledge of Communities of Achanakmaramarkantak Biosphere Reserve in Utilization, Conservation and Sustainability of NTFP in Chhattisgarh (India), *Indian Forester*,137(11):1313-1320.

Bhojvaid P P, Singh M P, Reddy SR and Ashraf J. 2016. International Society for TropicalEcology, *Tropical Ecology*, 57(2): 133-141.

Bryceson DF. 1996. 'De organisation and rural employment in sub-Saharan Africa: a sectoralperspective', World Development, 24(1): 97-111.

Campbell J Y. 1993. Putting the people's products first, non-timber forest products and the challenge of managing forest to enhance local income. Paper presented at the International seminar on MFP in forestry. 17-18th April, Dehradun, India.

Center for Microfinance and Development (CDM) Working Paper 03, University of Dhaka, Bangladesh, 1-16.

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.

Chandrasekhar CP. 1993. 'Agrarian change and occupational diversification: non-agriculturalemployment and rural development in West Bengal' Journal of Peasant Studies, 20 (2):205-270.

Chhetri AK. 2006. Local Institutions and Forest Products Extraction: Evidence from Forest Management in Nepal, Sandee Working Paper No. 16-06.

Chopra K. 1993. The Value of Non-Timber Forest Products: An estimation for tropical deciduous forests in India, *Economic Botany*, 47:251-257.

Chowdhury M J A. 2007. Does the Participation in the Microcredit Programs Increase Consumption of Participating Households? The Case of the Grameen Bank in Bangladesh.

Clarke P and Jha J. 2006.'Rajasthan's Experience in ImprovingService Delivery in Education,' in Chand, V.K. (ed.) *ReinventingPublic Service Delivery in India*.Sage, New Delhi.

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

Das V. 1998. 'Human Rights, Inhuman Wrongs: Plight of Tribals in Orissa', *Economic andPolitical Weekly*, 14 March.

Das, S.(2016) forest dependency and sustainability of forest resources: evidence from rural odisha.International Journal of Recent Scientific Research. Vol. 7, Issue, 8, pp. 13190-13195, August.

Das,BB (2018). "Sustainable NTFPs harvesting: A good option model for women forest dwellers' food security and livelihood promotion". International Journal of Humanities and Social Science Research. Volume 4. Issue 1. January 2018.Page No. 11-20. International Journal of Humanities and Social Science Research.

Deininger K and Lyn S. 1996. Economic growth and inequality: re-examining the links.*World Bank Economic Review* 10: 565-91.

Dercon S. 2002. World Bank Research Observer 17(2): 141 – 166.

Dreze J and Sen A. 1991. Hunger and Public Action, OUP: Oxford.

Dreze J. 1988.Famine Prevention in India, WIDER Working Papers (UNU).

Dubey A. 2002. "District-wise Poverty Incidence in India in 1999-2000", Department of Economics, NorthEastern Hill University, Shillong, Meghalaya, October (mimeo).

Ehrlich A. R. and Ehrlich P R. 1990.*The Population Explosion*. New York.

Ehrlich P R. 1968.*The Population Bomb*.Sierra Club. Ballantine, New York.

Ellefson PV. 1992. *Forest Resources Policy: Process,Participants and Programs.* New York: McGraw-Hill.

Evans HE and Ngau PM. 1991. 'Rural-urban relations, household income diversification andagricultural productivity', *Development and Change,*22(3): 519-545.

Fan S, Peter H and Sukhadeo T. 1998. Government Spending, Growth and Poverty: an analysis of interlinkages in rural India. Mimeo, IFPRI.

FAO. 1995. Non-wood forest products in nutrition food and nutrition Division in non-wood forest products for sustainable forestry. Indonesia, 17-27, January, Non wood forest product 3, FAO, Rome.

FAO. 1995. Non-woodforest products for rural income and sustainable forestry.*Non-wood Forest Products,* 7: 1–2.

FAO. 1999. FAO forestry towards a harmonised definition of non-wood forest products, Unasyiva, 50 (198): 63-64.

FAO. 1989. *Household food security and forestry: an analysis of socio-economic issues.* FAO Community Forestry Note No. 1. Rome.

FSI. 2000.*State of India's Forests*, Dehradun: Forest Survey of India.

Ganapathy MS. 1998. Collection and marketing of non-timber forest products –A study in Kollegaltaluk of Karnataka. *M Sc thesis*, University of Agricultural Sciences, Bangalore.

Gauraha A K. 1992. Micro-economic analysis of a tribal village, *Indian Journal of Agricultural Economics*, 47(3): 446-447.

Gautam and devoe (2005). "Ecological and anthropogenic niches of sal (Shorea robusta Gaertn. f.) forest and prospects for multiple-product forest management – a review". Forestry: An International Journal of Forest Research.Volume 79. Issue 1. 1 January 2006. Pages 81–101.

Ghosh J and Bharadwaj K. 1992. 'Poverty and Employment in India', in H. Bernstein, B. Crow andH. Johnson (eds) Rural Livelihoods: Crises and Responses, Oxford: Oxford UniversityPress and The Open University.

Ghosh R C. 1976. *Diospyrosmelanoxylon*; its problem in cultivation, Indian Forester, 102 (6): 326-336.

Giri TK, Mazumdar A and Santra SC. 2005. Major NTFP Items and their Marketing Potentials at Hazaribagh Forest Area in Jharkhand - a Case Study, *IndianForeste* ,131 (3):425-436.

Global adult tobacco survey India, 2009–2010.

Godoy R A and Bawa K S. 1993. The economic value and sustainable harvest ofplants and animals from the tropical forest: assumptions, hypotheses, andmethods. *Economic Botany*, 47: 215-219.

Gomes KA and Gomez AA. 2014.Statistical Procedures for agricultural research.Second edition. An international Rice Research Institute Book. John Wiley and Sone, New York.690p.

Govt of Orissa (2000), Report of the Task Force(on KenduLeaves Trade), Forest DepartmentILO(International Labour Office) (2003), Making ends meet: Bidi workers in India Today.

Grimes A, Loomis S, Jahnige P, Burnha MM and Mendelshon R. 1994. Valuing rainforest: The economic value of Non-Timber Forest products in Equador.*Ambio*23(7): 405- 410.

Guleria C, Vaidya M K and Kireeti K.2015. marketing margins and channels for Stevea cultivated in mid-hills of Himachal Pradesh,*Inrenational Journal of Farm Science,*5 (2): 161-168.

Gupta T and Guleria A. 1982. Non wood forest products in India, Economic potentials; centre for management in Agriculture, Indian Institute of Management, Ahmedabad, oxford and IBH publication.

Gustavo A and Kostas S. 2007. Rural development and poverty reduction: is agriculture still the key? Journal of Agricultural and Development Economics 4(1): 5-46.

Hans A and Patel A. 2012. Women of Odisha : Status and Challenges Odisha Review.

Holdne S, Shiferaw B and Wik M. 1998. Poverty, Market Imperfections andTime Preferences: of Relevance for Environmental Policy? *Environmentand Development Economics,* 3(1): 105-130.

Islam MA, QuliS MS, 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.

Jodha NS. 1990. Rural common property resources: contributions and crisis foundation day lecture.

Joshi PC and Rao M R. 1964. Social and Economic Factors in Literacy and Education in Rural India the economic weekly.

Joshi PC and Rao MR. 1964. Social and Economic Factors in Literacy and Education in Rural India the economic weekly.

Kar, SK (2014). "Challenges in marketing of different commodities particularly the minor forest produces in the tribal sub plan areas in Odisha". Department of Agriculture Business and Management Centre for Post Graduate Studies, OUAT in partial fulfilment of the requirement for award of degree of Master of Business Administration.

Karan A K. 2003. Changing Pattern of Migration from Rural Bihar, *Land and Development*,9(2):155-195.

Karan AK. 2003. 'Changing Pattern of Migration from Rural Bihar', *Land and Development*,9(2): 155-195.

Kaur S. 2014. Nominal Wage Rigidity in VillageLabor Markets, mimeo, Columbia University.

Khanal R C. 2009. Climate change and organic agriculture. *The journal of agriculture and environment*,10:100-110.

Khanal RC. 2009. Climate change and organic agriculture. *The journal of agriculture and environment*, 10: 100-110.

Khatri-Chhetri. A. 2006. Local Institutions and Forest Products Extraction: Evidence from Forest Management in Nepal, SANDEE Working paper, pp 16.

Kumar C. *et.al* (2015) . "Shorea robusta (dipterocarpaceae) seed and its oil as food". International journal of food and nutritional sciences.Volume 4. Issue 4.Jul-Sep 2015.

Leach, M, Robin M and Ian S. 1998 (in press). Environmental entitlements: dynamics and institutions in community-based natural resource management. *World Development.*

Lele S, Ramanujam RV and Rai J. 2015. Cooperative procurement and Marketing of kendu leaves in Madhya Pradesh, *Ashoka Trust for Research in Ecology and The Environment* , Discussion Paper No. 3.

Lubina F. Qureshy (Eds), Population, Environment and Development, Tata Energy Research Institute.

Mac Millan and Gubbi, 2008. "Can non-timber forest products solve livelihood problems? A case study from Periyar Tiger Reserve, India". Oryx. Volume 42. Issue 2. April 2008, PP-222-228.Oryx.

Mahapatra IC. 2009. Productivity of Agriculture in Odisha –Challenges and opportunities in leveraging technology Scientific Articles By Eminent Agriculturists.

Michael W. 2014. Rural Education.An effective student Oriented Classroom Environment (NCERT), International Development (DFID) India Country Programmme, 2014. New Delhi.

Ministry of panchayati raj government of India New Delhi. 2011. Ownership, price fixation, value addition and marketing of minor forest produce.

Mink S D. 1993. Poverty, Population and the Environment, World Bank Discussion Paper 189, The World Bank, Washington D. C.

Mishra CK and Naidu GVR. 2013. NTFP Collection: a Case Study in Opportunity Costs, *Indian Forester*, 139(1):14-23.

Misra, R. 1969. The primary productivity of terrestrial communities at Varanasi. *Trop. Ecol.*10,1–15.

Mitchell CP, Corbridge SE, Jewit SL. Mahapatra AK andKumar S. 2003. Non timber forest products: Availability, production, consumption, management and marketing in Eastern India.

Mohanty S. 2012. Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and Tribal Livelihoods: A Case Study in Sundargarh District of Odisha.

Naidu MR. 2006.Temporal variation in marketing of Minor Forest Product in Tribal zone of Andhra Pradesh.*Indian Journal Agricultural Marketing*, 6(2): 104.

Naik AR andGawande SM. 2013.Kendu Leaf waste Generation from Bidee Industries in Solapur City - A Review, *International Journal of Science and Research*,4(6):432-438.

Namedo RK and Pant NC. 1994. Role of minor forest products in tribal economy, *Journal of Tropical Forestry*, 10 (1): 36-44.

Nanda P. An Overview of the Past and Current NTFP Policy Environment in Orissa, Report, Vasundhara, Bhubaneswar, 2001.

Nandi A, Ashvin A, Guindon GE, Chaloupka FJ and Jha P. 2014. Estimates of the economic contributions of the bidi manufacturing industry in India.

Nandkumar.1988. A study on Impact of Integrated Tribal Development Project on Neumaim RP And Hirsch E. 2000. Commercialization of Non- Timber Forest Products .Review and Analysis of Research. Bogor: *Center for International Forestry Research,Bogor, Indonesia*.

Narang U. 2012.Self help group: an effective approach to women empowerment In India,*International Journal of Social Science & Interdisciplinary Research*,1 (8): 445-468.

Neuman WL. 1994. Social Research Methods: Qualitative and QuantitativeApproaches (2nd ed.). London: Allyn and Bacon.

Neumann and Hirsch E. 2000. Commercialization of Non-Timber Forest Products: Review Odisha kenduleaf Act. 1961.

Olawoye JE. 1996. Sociological issue for sustainable forest management. Ghana,*Journal*of *Forestry*, Special edition, 3:18-33.

Pachauri R K and Lubina F. 2006.Population, Environment and Development, Tata Energy Research Institute, New Delhi, pp. 191-213.

Pal SS. 1990. Bamboo article Social Science Google Book Page 37.

Palit S. 1995. Role of NTFP in Joint Forest Management, Proceedings of seminar on Joint Forest management (JFM).March 8-9, Calcutta.

Panigrahy, R (2001). Compulsions and Options Relating to Livelihood Alternatives of the Poor in the Forestry Sector in Orissa: An Analysis. Paper presented at the conference Livelihoods and Poverty Reduction: Lessons From Eastern India, 25-27 September 2001, by Rekha Panigrahi, Vasundhara, Orissa.

Patel B B. 2004. Problems of Home-Based Workers in India, Delhi: OUP and IBH Publishing Co.

Pathak B. 2013.Economic Development and Golden Leaf of Odisha, *Odisha Review*, 63-67.

Pérez MR. 1995.A Conceptual Framework for CIFOR's Research on Non-Wood Forest Products.Working paper no. 6.

Piya L, JoshiNP andDangol DR.2011.Collection and marketing of non-timber forest products by Chepang community in Nepal, *The Journal of Agriculture and Environment*,5(12);150-162.

Ramesh B. 2016.A Study on Plant Product Extraction and Indian Economy, *International Journal of Innovative Research in Science, Engineering and Technology*, 5(1):120-125.

Ranjan and Sashi(2015). "Studies of Potential of Different Markets of Ranchi Districts for disposal and sale of NTFPs".Thesis for Post Graduate Studies, Birsa Agricultural University in partial fulfilment of the requirement for award of degree of Master digrees.

Rao and Prasad AG. 1992. Employment and income pattern of the tribal, *Indian Journal of Agricultural Economics*,47(3):440.

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.

Ray GL and Mandal S.2014. Research methods in social sciences and extension education. Kalyani publishers, New Delhi.330p.

Reardon T. 1997. Using Evidence of Household Income Diversification to Inform Study of the Rural Non-farm Labor Market in Africa, *World Development*,25(5):735-747.

Reddy MG, Bhattacharya P, Patnaik S. 2007.Non-Timber Forest Products and Forest Governance, Forest Governance Learning Group – India.

Regional Centre for Development Cooperation in 2013. Deregulation of Kendu leaf management in Odisha and Maharashtra.

Rez M, Ruiz PAndArnold JEM. 1995.Current issues in non-timber forest products research*Center for International Forestry Research,Bogor, Indonesia*.1-259.

Robin M. 1999. Access to Land in Rural India Policy Issues and Options. World Bank Policy Research Working Paper. 57P.

Rose E. 2001."Ex Ante and Ex Post Labor Supply Response to Risk in a Low-income Area," *Journal of Development Economics,*64: 371-388.

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 Stud Tribes Tribals*, 8(1): 21-25.

Rudel T K.2005.Tropical forests: regional paths of destruction and regeneration in the late twentieth century. NewYork: Columbia University Press.

SahuSC,Dhal NK, Reddy S, Pattnaik C and Brahmam M .2007. Phytosociological study of tropical dry deciduous forests of Boudh district, Orissa, India, *Research Journal of Forestry,*1(2): 66-72.

Sakhrie R and Sharma A. 2015. A study of marketing efficiency of Bamboo shoots in Dimapur district of Nagaland, *Inrenational Journal of Farm Science,*5 (2): 151-154.

Samantaray LL.2015. A Study on the Current Trend of Agricultural Productivity in India and its Future Prospects. *International Journal of Humanities Social Sciences and Education* ,2(4): 2349-2381.

Sapkota I P and Odén1 P C. 2008. Household Characteristics And Dependency On Community Forests In Terai Of Nepal, *International Journal of Social Forestry,* 1(2):123-144.

Saxena NC.2003. Livelihood Diversification and Non-Timber Forest Products in Orissa: Wider Lessons on the Scope for Policy Change.Working Paper 223.

Shankar U, Hegde R andBawa KS. 1998.Extraction of non-timber forest products in the forests of BiligiriRangan Hills, India, Fuelwood pressure and management options, *Economic botany,*52(3): 320-336.

Shiarwar RLS, Pathak B and Jaiswal A. 2008. Some unique ethnomedicinal perception of tribalscommunities chitaoot of Madhya Pradesh, *Indian Journal of Traditional Knowledge,*7(4): 613-617.

Shit PK and Pati CK. 2012. Non-Timber Forest Products for Livelihood Security of Tribal Communities: A Case Study in PaschimMedinipur District, West Bengal, *Journal of Human Ecology*, 40(2): 149-156.

Sills EO, Lele S, Holmes TP, and Pattanayak SK. 2011.Ministry of panchayati raj government of India New Delhi, 2011, report of the committee on ownership, price fixation, value addition and marketing of minor forest produce.

Singh A, Bhattacharya P, Vyas P and Roy S. 2010. Contribution of NTFPs in the Livelihood of Mangrove Forest Dwellers of Sundarban, *Ecol,*29(3): 191-200.

Subedi B P. 1997. Population and Environment Interrelationships: The Case of Nepal, in R K Pachauri andSundarban Mangrove Forest: Bay of Bengal from <http://www.unesco.org (Retrieved June 19, 2008).

Subramanyam A. 2003. Ecology, technology and resources management among the tribes of Eastern Ghats: An Anthropological study". Full length paper submitted for the conference "Livelihood strategies among forest – related tribal groups of south India, Mysore , October 17-19.

Sudarsen and Sumathi. 2003. State and the forest-related communities: Issues and paradigms of development, Paper presented at the conference on Livelihood strategies among forest related tribal groups of South India, Centre for Indian Studies, Mysore, October, 17-19, 2003.

Sudhakar T, Agarwal RK and Agarwal A. 2013. Non-timber forest products as ansource of livelihood option for forest dwellers: role of society, herbalindustries and government agencies, *Current Science,* 104(4):440-443.

Sunley E M. 2008. The tax treatment of bidis. Bloomberg Initiative to Reduce Tobacco use.

Tamang NB. 2001. Role of Network Marketing In Non-Timber ForestProducts (NTFPs) Promotion Project Paper.

Taylor E andWyatt T. 1996.The Shadow Value of Migrant Remittances, Income and Inequalityin a Household-Farm Economy, *Journal of Development Studies*,32(6):899-912.

Taylor FW and Parratt NT. 1995. The Potential of Non-Timber Forest Products ofBotswana, Australasian council on tree and nut crops.

Tejaswi and Basavarajappa P. 2008. Non-Timber Forest Products (NTFPs) for Food and Livelihood Security: An Economic Study of Tribal Economy in Western Ghats of Karnataka,India.

Tewari D N. 1993. Non-Timber Forest Produce in Poverty Alleviation. *Indian Forester,* Dec.: 959–968.

TI RTE-SSA. Boudh. 2015. Procative Disclosure Under Section 4(1)(b) of RTI Avt, ’05 in respect of District Project Office, Right to Education-SarvaSikshyaAbhijan, Boudh. 27P.

Ugwumba COA, Okoh RN, Ike P C, Nnabuife ELC and OrjiEC. 2010. Integrated Farming System and its Effect on Farm Cash Income in Awka South Agricultural Zone of Anambra State, Nigeria American-Eurasian J. Agric. & Environ. Sci., 8 (1): 01-06.

Vasundhara 2001. A Note on New Resolution to NTFP Price Fixation, Policy Advocacy Cell,October, Bhubaneswar: Vasundhara.

Waggoner PE. 1983. Agriculture and a climate changed by more carbon dioxide. Changing climate. National Academy Press, Washington, DC, p 383–418.

Wills RM and Lipsey RG. 1999. An economic strategy to develop Non-Timber Forest Products and Services in British Columbia. 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 Research Network.

World Bank 2015 India: Policies and Issues in Forest Sector Development (Report No. 10965-IN). World Bank, New Delhi.

World resources institute. 1990. The World Bank in the forest sector: a global policy paper. *Wasteland News,* 8(2): 6-12.

Xayvongsa L, Bae YS, Choi YE and Seon J. 2009. Role of NTFPs in Rural Livelihood of Lao PDR, *Journal of Forest Science,* 25(2):85-91.

Yadav M and Basera K. 2013.Status of Forest Products Production and Trade Working Paper Series (2013/1).YeravaTribals in Virajpet taluk of Coorg district.

Yadav M. 2009. Baseline study on NTFP in Madhya Pradesh, Chhattisgargh and Vidhrbha region of Maharastra, Indian Institute of Forest Management, Bhopal.

Nayak BK 2015. Traditional Leaf Plate Making: Its Impact on the Livelihood of Scheduled Caste Women of Mayurbhanj District, Odisha, India. International Journal of Management and Social Sciences Research (IJMSSR). Volume 4. No. 7.July 2015.

Appendix – I

Interview Schedule

Date of Interview:

Name of village: **Gram Panchayat:**

Block / Cluster: **District:**

Name of the Interviewer:

Respondent Profile:

Name:		
Father'/Husband's Name		
Relation with head of HHs:	Self	**1**
	Wife	**2**
	Son	**3**
	Daughter	**4**
	Others (specify) 99	**99**
Age		
Sex	Male	**1**
	Female	**2**
Qualification	Not Formally Literate	**1**
	Up to 5th Standard	**2**
	Up to 10th Standard	**3**
	Up to 12th Standard	**4**
	Up to Graduate	**5**
	Other Degree (Specify)	**99**

Demographic Profile

Sl. No	**Name**	**Sex**		**Age**	**Relation with HoH**		**Education**		**Marital Status**	
		M	**1**		**Self**	**1**	Not formally literate	**1**	**Married**	**1**
		F	**2**		**Wife**	**2**	Up to 5th standard	**2**	**Un-Married**	**2**
					Son	**3**	Up to 10th standard	**3**		
					Daughter	**4**	12th standard	**4**		
					Others (Specify)	**99**	Graduate	**5**		
							Others	**99**		

Household livelihood profile

Name	**Principal Employment**		**Avg. Days Involved**	**Annual Income**	**Secondary Employment**		**Avg. Days Involved**	**Annual Income**
	Activity Type				Activity Type			
	Agri	1			Agri	1		
	Livestock	2			Livestock	2		
	NTFP	3			NTFP	3		
	Labour	4			Labour	4		
	Others	99			Others	99		

Land ownershi

Sl. No	**Household Type**	**Tick appropriate row**
1	**Landless** (No Cultivable Patta Land owned or leased in)	**1**
2	**Marginal farmers** (less than 1 Ha. Of Land)	**2**
3	**Small farmers** (1-2 Ha. of Land) 3	**3**
4	**Medium farmers** (2-4 Ha. of Land)	**4**
5	**Large farmers** (More than 4 Ha. Of Land)	**5**

NTFP Products Marketing Particulars:

Product	**Approximate Quantity collected daily**	**Own use (In Kg.)**	**Marketable Surplus. (In Kg)**	**Place at which sold (Options)**	**Price at which sold**	**Annual income from NTFP**

Options: Neighbours-1, Local Shop-2, Haat –3, Trader outside village-5, Trader outside village-4, Any other-5