

## **Economic Role of Non-Timber Forest Products (NTFPs) in the Livelihood of Scheduled Tribes in Similipal Area of Mayurbhanj District of Odisha**

**Pratap Kumar Jena**

*Assistant Professor, Department of Economics, North Orissa University, Baripada, Odisha-757003*

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**ABSTRACT:** *Similipal forest in the Mayurbhanj district of Odisha is the largest tiger reserve and the biggest wildlife sanctuary in India. For many years, some indigenous tribal people have been living within the forest and fully depending on the forest products for livelihood. Since it has become a protected area, there is banned on the collection of NTFPs. Forest department forcefully displaced some tribal people outside the forest, but still many tribal people are living within the forest and depending on the forest for their livelihood. This study has made an attempt to examine the economic role of NTFPs in the livelihood of tribal people in the Similipal area of Mayurbhanj district of Odisha. The study found that almost all tribal people in the study villages collect NTFPs illegally and sold in local markets. The NTFPs contribute highest income shares to total household income. As there is no restriction on the collection of leaves, they earned highest income by selling various leaves but they walk 10 to 15 km and spend whole day to collect leaves. Most of them carry NTFPs on their head and few of them by their bicycle, but none of them use any transport vehicles. These people prefer to sale NTFPs to traders at nearby their houses even at a lower price to avoid transport cost, the daily wage and also avoid monetary fines of the forest department. As the livelihoods of the tribal people of these villages depend on NTFPs, the study suggests that there must have markets and proper price for these products. Government should provide some financial benefits to self-help group(s) or must allow people to set up paper plate or cup factory to avoid traders' dominance.*

**KEY WORDS:** *Economic Development, Forest, Gender, Production, Consumption, Education*

**JEL Code:** *O1, Q23, sssJ16, E23, E21, I25*

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### **I. INTRODUCTION**

Forest plays a significant role in the livelihood of forest dependants particularly to indigenous tribal people, who are residing in the forests. Since long back tribal people are residing in the forest, have few livelihood options other than hunting animals in the forest and the collection of NTFPs for their food, medicines and income (FAO 1995, Falconer 1996 and Ros-Tonen 1999). Since killing/hunting of forest animals become a crime, there is a threat to the livelihood of tribal people. These days forest products such as timbers and non-timbers have a greater role in the livelihood of tribal people from all over the world. NTFPs are internationally known as Non-Wood forest products (NWFPs) include all biological materials, other than timber, are extracted from forests and used as food and food additives (edible nuts, mushrooms, fruits, herbs, spices and condiments, aromatic plants, game), fibers (used in construction, furniture, clothing or utensils), resins, gums, and plant and animal products used for medicinal, cosmetic or cultural purpose for human use (FAO 1999, Khanal 2006). Forest industries contributed more than US \$450 billion in 2008 to national income, which is nearly 1% of income and provides employment to 0.4% of the global labour force (FAO, 2012). Monetary contribution of forest to the developing countries exceed US \$250 billion, which is more than double of the flow of total development assistance and more than the annual global output of gold and silver combined (Agrawal, et al., 2013)

Historically, the tribes in the district were depending on forest products for their livelihood and also for medicines (Saxena, 1995). In recent years, the practice of collection of forest products is slowly vanishing at a faster rate due to rampant deforestation and the displacement of the tribals from the traditional habitats (Kennedy, 2006). Tribal people collect NTFPs irrespective of their income level (Verma and Paul, 2016) and the income contribution of NTFPs to total income varies across ecological settings, sessions, income level, etc. (Pandey, et al., 2016). NTFPs contribute to the well-being of rural households in terms of food security, nutrition, health and subsistence. It provides macronutrients, carbohydrates, fats & proteins and other micronutrients (FAO, 1992). The medicinal plants of NTFPs have remained as an important source of traditional medicines in various nations like Indian Ayurveda, Chinese, Unani, Siddha, Tibetan, etc. (GoI, 2000).

The income from NTFPs depends on respective NTFPs price and the fluctuation of price directly reflects on the consumption, saving and investment (Singh, 2012). NTFP contributes 95% to the annual income of people in the district. The average annual income of NTFPs is higher in families residing in plain area than the hilly area (Behera and Nath, 2012). The impact of substitute prices varies from one product to another for which there is no income effect as all the NTFPs are not inferior products (Gopalakrishnan, et al., 2004). There are certain factors such as seasonality, poor transport, lack of storage facilities and market information are major constraints for marketing and trade of NTFPs. In addition to that the level of education, gender, household income, ethnicity, distance to the market and access to roads, market knowledge and price information significantly influence the income of NTFPs (Amusa, et al., 2017). The regeneration of NTFPs depends on the quantities of leaves, seeds, roots and fruits collection as well as the plantation (Murali, et al., 2014).

Similipal forest in the Mayurbhanj district of Odisha is the largest tiger reserve and the biggest wildlife sanctuary in India. For many years, some indigenous tribal people were living within the forest and fully depending on the forest for livelihood. The dominant tribes such as Santhal, Kolha, Bhumija, Bhuyan, Mahalis, Sounti and Saharas are involved in the collection of NTFPs in this area (Rout, et al., 2010). Since it's become a protected area, many tribal people are displaced outside the forest and there is banned on the collection of forest products (timber as well as non-timber). They are very few studies have been made on the livelihood of tribal people in the Similipal tiger reserve area but none of the studies have examined the economic role of NTFPs in the livelihood of tribal people in the Similipal Area of Mayurbhanj district of Odisha. Therefore, this study has made an attempt to examine the economic role of NTFPs in the livelihood of tribal people in the Similipal area of Mayurbhanj district of Odisha. The rests of the paper are as follows; section-2 analyses the study methodology and data. Section-3 describes the estimated results and the last section-4 gives the study conclusion.

## **II. METHODOLOGY AND DATA**

The Mayurbhanj district comprises the highest number of tribal people in the state, which occupies more than 52 percent of tribes out of total population and 53 communities both aboriginal and migrated from nearby places (naik, 1988). Similipal forest in Odisha is known for the largest tiger reserve in India, is located in the central part of Mayurbhanj district of Odisha and the Northern Eastern Ghats of Odisha. It contributes around 38% of the total area of the Protected Area (PA) network in Odisha (Singh, 1998). Similipal is widely also known as wildlife sanctuary and has own significance in the nations' biodiversity. In 1973, the central government declared it as 'tiger reserve' under the national flagship conservation programme for tiger project. Further, the state government declared it as the wildlife sactuary in 1979 with a designated area of 2750km (Adhikari, 2005 and Dash, et al., 2016). It is home to more than 94 species of orchids and about 1076 species of other plants (Mohanty, 2010). This reserve has black and melanocytic tigers, which are very rare than any other tiger reserves in India. Due to its high biodiversity concentration and characteristics this become a hub for scientific and biodiversity research (Rout, 2008).

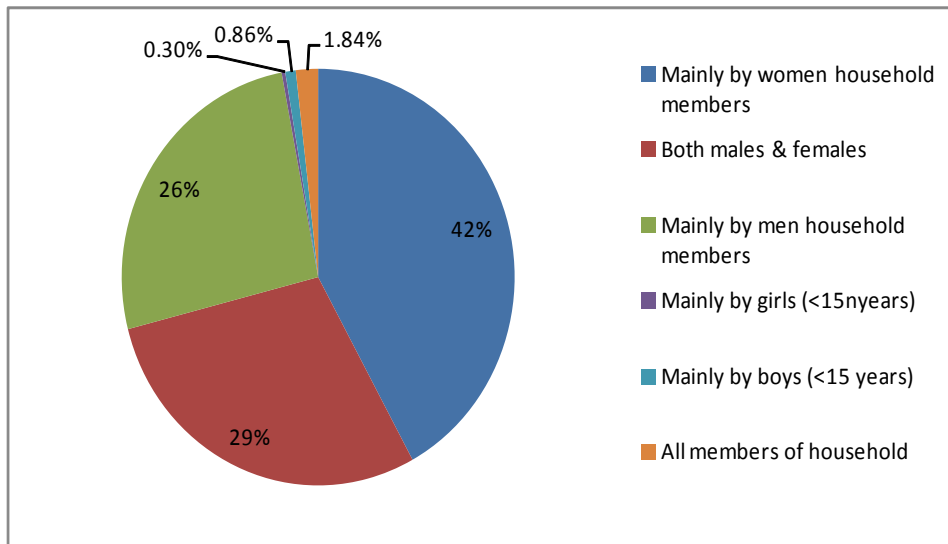
This reserve is also home to large numbers of indigenous tribal people, which are grouped into different categories such as Kolhas, Munda, Bhatudi and Bhumija. There are two primitive tribal groups such as Hill Khadias and Mankadias, who are totally depending on the forests for livelihood (Dash, et al. 2016). They hardly come out from the forest to collect other cocking items like salt, potato, onion, etc. with the exchange of honey and resin (Pattnaik, 1997).

The primary data have been collected from the core and non-core area of the Similipal forest. They collect NTFPs without permission from the forest department, therefore, at first they hesitate to answer the questionnaire method. Then the data has been collected with informal and open ended questionnaire. The study selected villages are Gurguria, Nawana, Bakua, Krunachandrapur, Lulung, Bareipani, Balarampur, Gadasahi, Gadasimilipal, Jenabil, Kabatghai, Makabadi, Suruda, Kandibil and Kumari. The selected study villages as well as the number of population size are very small and scattered, the data have been collected randomly as all the households are involved in the collection of NTFPs. Total 228 samples were collected from the selected villages but after the removal of 28 irrelevant questionnaires, the total 200 samples are used in the data analysis.

## **III. ANALYSIS OF RESULTS**

Odisha including Maharastra, Andhra Pradesh, Mandhya Pradesh, Chhatisgarh, Bihar and Jharkhand comprises nearly 65% tribal population and contribute about 70% of NTFPs production in India (Guha, 1983). Mayurbhanj district consists 52% of tribal population in the state. Tribal women are mainly collecting NTFPs in the study area (Table-1). The NTFPs are collected mainly only by tribal women (42%) followed by only tribal men (26%) but together (both women and men) 29% are involved in the collection of NTFPs. Among the children, boys are more involved (0.86%) than girls (0.30%) in the collection of NTFPs as the girls cook food and do other house works. In some households, all members (1.84%) are involved in the collection of NTFPs but very less in numbers.

**Figure 1: Collection of NTFPs by the Members of Households in the Study Area**



Source: Author estimation from field data.

The socio-economic profile of tribal people is shown in Table-1, who have been actively engaged in the collection, processing and marketing of NTFPs in the study area. It indicates the demographic position of NTFPs collectors as we all their educational level, family size, income level, etc. It shows that 43% females and 33% males are actively participating in the collection of NTFPs in the study villages. Majority of them (80%) are married, 13% are unmarried and 7% are widows. Mostly, the NTFPs collectors are young and middle aged groups such as 43% people are 26 to 50 years, 39% people are bellow 25 years age and only 18% are above the age of 51 years. The NTFP collectors are not highly educated as 37% are illiterate, 46% are primary educated and only 17% are the upper primary educated people. Though, tribes have their own religion, but 18% tribes in the study villages are converted to Christianity and other 82% are Hindus as they get some non-government and government facilities. The tribal people mainly depends on the Similipal forest for their livelihood, therefore, the majority of them (92%) earn less than Rs. 10,000 monthly income and only 8% people earn around 15,000 per month income. Other than NTFPs collection, they produce some pulses and vegetable in their land, they hardly come to market to get some grocery items. Therefore, 18% households spend less than Rs. 1500 per month and the majority of households (59%) spend between Rs. 1500 to 5000 per month, only 23% households spend around Rs. 10,000 per month. The NTFPs are not available in the whole year, hence, the collections of NTFPs are seasonal. Majority of the households (62%) collect NTFPs in the winter followed by the rainy season (28%), only 10% households collect in the summer as it become very hot and the forest become dry in the summer. Lager number of households (45%) have around 20 years of NTFPs collection experience, 13% have more than 30 years of experience, and only 15% have less than 10 years of experience on NTFPs collection. It seems since many years these people are depending on this forest for their livelihood.

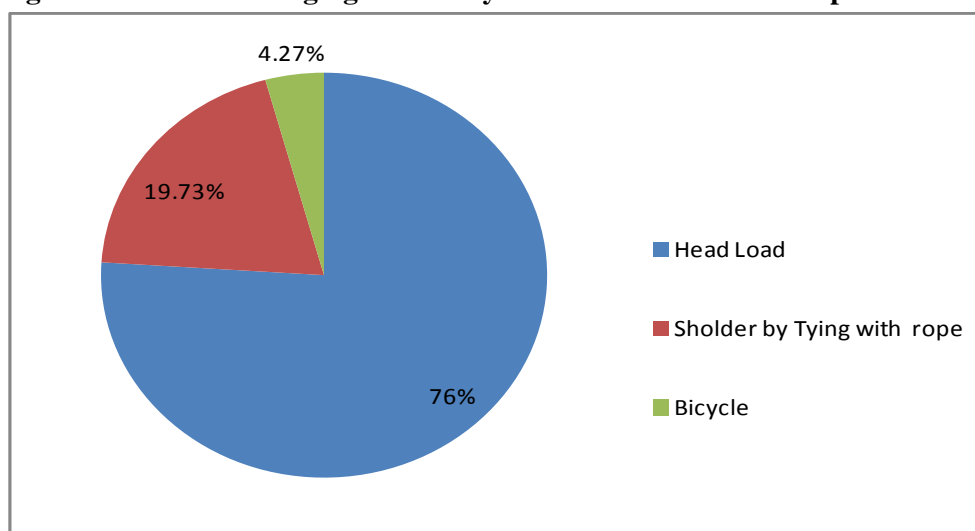
They carry NTFPs on their head and shoulder to their home and some of them carry to local market. Few of them they use their bicycle to carry but none of them use any commercial vehicles either to their home or to carry to local markets. They collect NTFPs from the deep forest, where there is no road connectivity and any transport facilities, therefore, 76% households brought by head load, 19.73% brought by shoulder by tying ropes and only 4.27% brought by bicycle.

**Table 2: Socio-economic Profile of the NTFPs Collectors**

Sl. No.	Variable	Category	Frequency	Percentage (%)
1	Age:	<25	39	39%
		26-50	43	43%
		51 above	18	18%
2	Sex:	Male	33	33%
		Female	67	67%
3	Marital Status:	Unmarried	13	13%
		Married	80	80%
		Widow	7	7%
4	Educational Status:	Illiterate	37	37%
		Primary	46	46%
		UP	17	17%
5	Family Size (Average):	Men	5.5	
		Women	1.34	
		Children	1.12	
6	Religion:	Hindu	3.28	
		Christian	1.12	
7	Monthly Income:	in Rupees (Rs.)		
		5000-9999	92	92%
		10000- 14999	8	8%
8	Years of experience in collection of NTFPs:	15000 above	Nil	
		Years		
		<10 years	15	15%
		10-20 years	45	45%
9	Season of Collection:	20-30 years	27	27%
		30 years above	13	13%
		Winter	62	62%
10	Monthly Expenditure:	Summer	10	10%
		Rainy	28	28%
		Family wise		
10	Monthly Expenditure:	<1500	18	18%
		1500-4999	59	59%
		5000- 9999	23	23%
		10000 above	Nil	

Source: Fieldwork Data Collected by Author

**Figure 2: Mode of Bringing NTFPs by the collectors from Similipal Forest**



Source: Author estimation using field data

They walk long distance inside the forest to collect NTFPs as these products are unavailable to nearby their place. As the NTFPs collection is the major source of livelihood, they walk around 10 to 15 kilometers inside the forest and spend whole day on collection (Table-3). It indicates the time and distance travelled by the tribal people to collect NTFPs in the Similipal forest area. They collect various NTFPs, among which leaves such as sal, siali and kendu leaves are in larger quantities as these collections have no restrictions. They collect amla, tamarind, siali bark, harida, bahada, honey, kendu, mahula, tasar, mushrooms, sal seeds, neem seeds, karanj seeds, charcoal, kusum seeds and etc. After the collection, they dry leaves, barks, roots, etc. on the sunshine to make it saleable. They are very careful at the time of drying leave because if leaves become too dry or semi dry, they loss the value of that products.

**Table 3: Time Taken and Distance Travelled by the household to collects NTFPs**

NTFPs	Time (Hrs) spend in a day	Distance Travelled (Km)
Amla	5 to 6	4 to 5
Bahada	8 to 10	10 to 12
Charcoal	3 to 4	2 to 3
Harida	8 to 10	10 to 15
Honey	8 to 10	5 to 10
Jammun	3 to 4	3 to 5
Jhuna	8 to 10	10 to 15
Karanj Seeds	2 to 3	2 to 3
Kendu	3 to 5	3 to 5
Kochila	6 to 8	5 to 10
Kusum Seeds	3 to 4	2 to 3
Mahula	8 to 10	5 to 10
Mushrooms	6 to 8	10 to 15
Neem seeds	5 to 6	4 to 6
Sal Leaf	8 to 10	10 to 15
Sal Seeds	8 to 10	10 to 15
Siali Bark	8 to 10	10 to 15
Siali Leaf	8 to 10	10 to 15
Tamarind	5 to 8	4 to 5
Tasar	8 to 10	10 to 15

Source: Field Data

The collected NTFPs are categorized into different groups such as oil seeds includes karanj seeds, neem seeds, kusum seeds and sal seeds. Second, food products such as amla, jammun, honey, kendu, mahula, mushrooms, tamarind charkol. Third, medicinal products such as harida, bahada, jhuna and siali bark. Fourth, leaves such as sala, kendu and siali are categorized into leaves. Except these, the other major NTFPs are tasar which is a wool product, and lastly, sabai grass. All these NTFPs are available and collected in different seasons in a year but mostly are available and collected in the winter followed by summer. The quantities of NTFPs collection varies from product to product as they have different market value. Among oil seeds, both neem and karanj seeds are collected in larger quantities as these trees are more, available nearer to their houses and there is no restriction. They also collect kusum and sal seeds but lesser in quantities as it depends on the seasonal availability. Similarly, among the food products, they collect more amla and tamarind followed by kendu, jammun and mahul. Tribal people in these villages collect different types of mushrooms but 'Rutka' and 'Parbana' mushrooms are very special in taste for which these have high demands and price in the local markets. They collect siali bark from trees, and then they crush and dry in the sunlight. They sold this bark and other medicinal products to traders but they receive very less price. Leaves have very high demand in local as well as outside markets but the GST has negatively influenced the marketing of leaves as the number of traders come down to purchase these leaves.

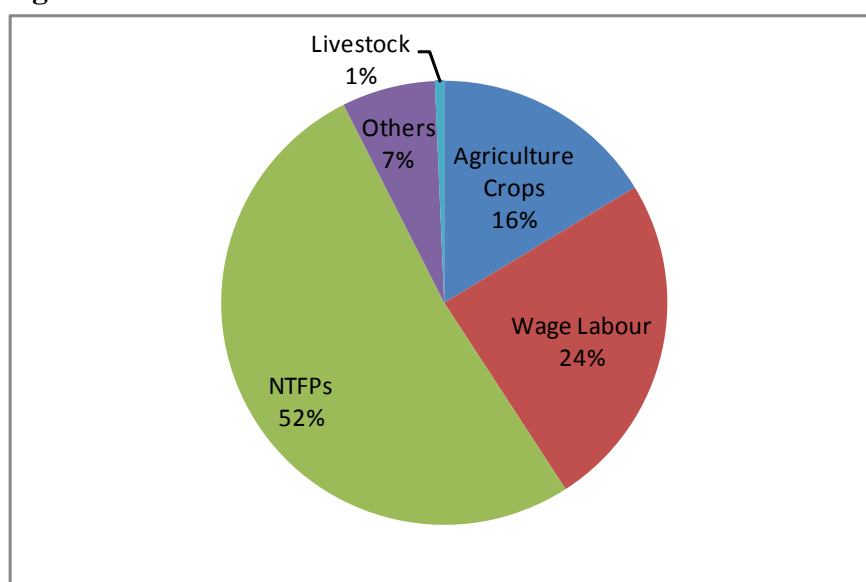
**Table 4: Seasonal Availability of Major NTFPs in the Study Area**

Category	NTFPs	Available Season	Quantity per day
Oil seeds:	Karanj seeds	winter	15 - 20 kg
	Kusum seeds	Rainy	10 - 15 kg
	Sal seeds	winter and summer	10 - 15 kg
	Neem Seeds	Rainy	20 - 30 kg
Food Products:	Amla	winter	10 - 15 kg
	Honey	summer and winter	2 - 6 kg
	Jammun	Rainy	8 - 10 kg
	Kendu	winter	10 - 12 kg
	Mahula	Summer	8 - 10 kg
	Mushrooms	Rainy	8 - 10 kg
	Tamarind	Summer	12 - 15 kg
	Charcoal	winter	2 - 3 kg
Medicinal Products:	Harida	winter	4 - 5 kg
	Bahada	winter	5 - 6 kg
	Jhuna	winter	4 - 5 kg
	Siali Bark	winter	50 - 60 kg
Leaf:	Sal Leaf	winter	4 - 5 bag
	Siali Leaf	winter	4 - 5 bag
	Kendu Leaf	winter	4 - 5 bag
Wool Product:	Tasar	winter	1 - 2 kg
Grass	Sabai grass	winter	15 - 20 kg

Source: Field Data

Since it becomes a tiger reserve in 2000, the state government restricted/banned the collection of NTFPs to local people. Due to unavailability of other means of production and source of income, these people illegally collect NTFPs from the forest and sales in their local market or to traders at a very low price. Figure-3 shows different sources of household income in the study villages, it indicates that NTFPs contribute the highest income share (52%) to household total income in the study villages followed by wage labour contributes the second highest (24%) share to total income. The least income comes from the livestock products and combine with agriculture contributes 17% to total income.

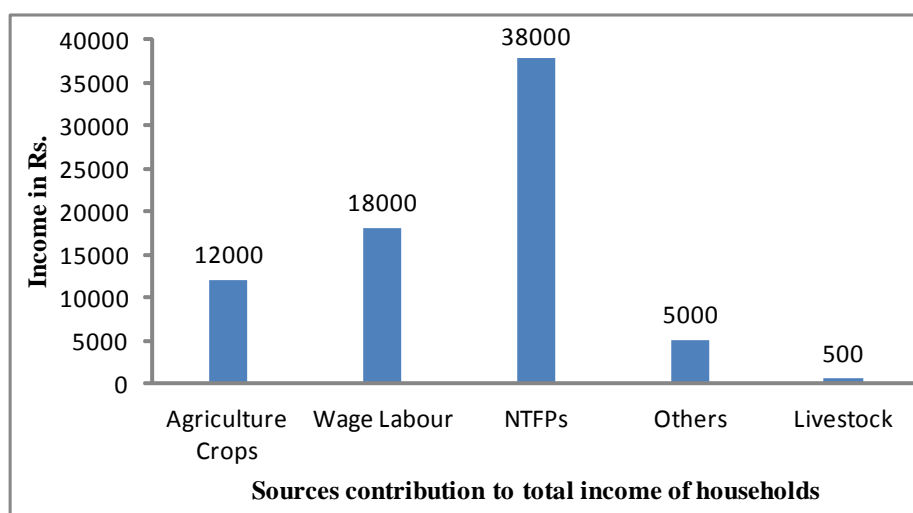
**Figure 3: Different Sources of Households Income**



Source: Field Data

Since the Similipal forest become a tiger reserve, the livelihood of the forest dependents is being in danger as the forest department not allowed anybody's to entry inside the reserve area. Now, all the tribal people collect NTFPs illegally or without the concerned of forest guards or any office people as they charge huge fine on them. The collections of NTFPs have drastically changed, which forced the tribal people migrate seasonally to big cities like Hyderabad, Chennai, Bangalore, etc. They have some agricultural land where they cultivate paddy and some of vegetables but that are not enough to meet their consumption as most of the time they don't cultivate due to various reasons. Most of them purchase rice, vegetables and grocery items from their local market called 'Hata'. Figure-5 shows different sources-wise income of the tribal people in the study area. It found that these people earned highest income from the NTFPs then followed by wage labourers. They have very less agricultural land in which mostly they cultivate paddy, some lands are unutilized due to water scarcity. Some households have livestocks such as hens, cocks, goats and ducks, which are basically for self consumption and very few of livestocks they sold in their local market.

**Table 5: Different Sources Contribution to Total Income of Households**



Source: Field Data collected by Author

They collect varieties of NTFPs that are categorized into six major heads, their contributions to total NTFPs income are shown in Table-6. The highest income comes from leaves such as sal, siali and kendu leaves as there is no restriction on the collection. They earned around Rs. 38000 income annually by selling these products without any costs. The second highest income (Rs. 6000/- annual income) comes from the selling of food products such as honey, berries, mushrooms, amla, jammun, kendu, tamarind, etc. They also sold some oil seeds like neem seeds, karanj seeds, kusum seeds and sal seeds from which they earned Rs. 2000/- annually. Sabai grass products have good demand within and outside the district but they sold sabai grass around Rs. 1500 annually. They sold some medicinal products such as roots and barks, some are directly consumed and some are consumed as ayurvedic medicines. They sold medicinal products around Rs. 2500 annually. Mayurbhanj district is famous for good resam cotton, which is collected from 'Tasar'. As it takes much time to collect but they sold around Rs. 1000 annually.

**Table 6: Categorisation of NTFPs Income of the Hoseholds**

Category of NTFPs	Average Income contribution (Rs.)
Oil seeds:	2,000
Food Products:	6,000
Medicinal Products:	2,500
Leaf:	25,000
Wool Product:	1000
Sabai Grass:	1,500
<b>Total</b>	<b>38,000</b>

Source: Field Data

#### IV. CONCLUSION

Similipal forest area is the widest area in the Mayurbhanj district of Odisha where many indigenous tribes have been living since many years. Most of them were fully depending on the collection of NTFPs from the forest for their livelihood. Since, it becomes the tiger reserve and national wildlife sanctuary, the NTFPs collection as well entries are being restricted. This study found that almost all tribal people in the study villages collect NTFPs illegally and sold in their local markets. The NTFPs contribute highest income shares to total household income in the study villages. As there is no restriction on the collection of leaves, they earned highest income by selling various leaves such as sal, siali and kendu leaves, but they walk 10 to 15 km and spend whole day to collect these leaves. Most of them carry NTFPs on their head and few of them carry by their bicycle but none of them use any transport vehicles. The study also found that tribal people prefer to sale NTFPs to traders nearby their house at a lower price to avoid transport cost, the day's wage and also avoid monetary fines of the forest department. As the livelihoods of tribal people in the villages depend on NTFPs collection, the study suggests that there must have markets and proper price for these products. Government should provide some financial benefits to self-help group or must allow people to set up paper plate or cup factory to avoid traders' dominance.

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