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Economic Empowerment of Tribes through Non-Timber Forest Products (NTFPs) in Chhattisgarh State

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ABSTRACT

The present study was carried out in Bilaspur district of Chhattisgarh in the year 2014-2015. For this purpose 135 NTFPs collecting tribes were selected as a respondent. The findings of the study indicated that out of 24 collected NTFPs 16 NTFPs were available in the month of April to June. 100.00 per cent of them were involved in collection of *mahua.* Selling of such NTFPs had generates total income of Rs. 1246929.14 annually to all sample households. Among these NTFPs maximum economic contribution came from *mahua*. It was also found that maximum per family normal employment generated from *mahua* collection. Majority of the respondents (88.89%) were got annually 75 to 150 days of overall normal employment from the collection of such NTFPs. Correlation analysis describes that out of 11 variable only 5 variables were significantly correlated with employment generation by NTFPs either at 0.05 or at 0.01 level of probability. In this study it was observed that NTFPs play a significant role in the economic empowerment of the tribes by providing them almost year round income and employment.

Keywords: Economic contribution, employment generation, Non-Timber Forest Products (NTFPs), tribes,

INTRODUCTION

Forest produce can be divided into several categories. But, from the point of usage, forest produce can be categorized into two types i.e. Timber and Non Timber forest products. Timber forest products mainly include the woody portion of tree, which is widely used as a fuel or/and raw material for home construction and furniture making. While non timber forest products refers to a wide array of economic or subsistence material that come from forests, excluding timber. The term Non Timber Forest Products (NTFPs) appears to have been coined, for the first time, by De beer and Macdermott in 1989. The United Kingdom's Forestry Commission defines NTFPs as "Any biological resources found in woodlands except timber. According to FAO, NTFPs defined as "All goods for commercial, industrial or subsistence use derived from forest and their biomass". Non-timber forest products (NTFPs) are also known as minor forest produce (MFP) or non-wood forest produce (NWFP). The estimated total value of the most economically important NTFPs in world trade is about US $11 billion annually (Anonymous, 2007). Among the most important NTFPs contributing to international trade are medicinal plants (689.9 million US$), nuts (593.1 million US$), ginseng roots (389.3 million US$), cork and cork products (328.8 million US$), and essential oils (312.5 million US$) (Walter, 2003). At least 150 NTFPs (*e.g.* honey, gum arabic, rattan, edible bamboo, cork, forest nuts and mushrooms, essential oils, and plant and animal parts for pharmaceutical products,

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etc.) are significant in international trade (Anonymous, 2005). According to the United Nations Food and Agriculture organization (Anonymous, 1997), it has been estimated that 80 per cent of the population of the developing world use NTFPs to meet some of their health and nutritional needs and several million households worldwide depend heavily on NTFP products for income.

In India forest represents the second largest land use after agriculture. It is claimed by Shiva and Mathur, 1996 that 2.3 million person years of employment are from forestry sector while the NTFPs provides estimated 1.6 million person years of employment in India. The value of output obtained from NTFPs in India is about Rs. 1810143 lakhs (Anonymous, 2013). The annual total production of these NTFPs is estimated to be 13450.11 tons. Out of such NTFPs, 4 NTFPs, namely *bamboo, mahua seeds, sal seeds* and *tendupatta* constitute the bulk of annual production (Philip *et al*, 2013). NTFPs act as a major source of both self-employment and indirect employment in forestry through their collection, processing and sale. In a country like India, which has more than half of its population in rural areas and a large tribal population reliant on forest produce for their sustenance, NTFPs play a major role (Sawhney and Engel, 2003). Small-scale forest-based enterprises, many of them based on NTFPs, provide up to 50 per cent of income for 20 to 30 per cent of the rural labour force in India (Campbell, 1988).

The forest cover Chhattisgarh state is 41.14 per cent. The estimated value of NTFPs in the state is Rs. 62276 lakhs (Anonymous, 2013). In the Chhattisgarh state the tribal population is 78.22 lakhs, which contributes 30.62 per cent of total population (Anonymous, 2011). Among this 30.62 per cent tribal population most of the tribal people are residing within or near the forest fringes. Where, Non Timber Forest Products (NTFPs) play a crucial role in securing livelihoods of the tribal people. So it is imperative to find out the extent of contribution made by a particular NTFP as well as by all collected NTFPs in the empowerment of the tribal people especially in terms of income and employment generation. Therefore the present study was taking into consideration and it is entitled as economic empowerment of tribes through Non-Timber Forest Products (NTFPs) in Chhattisgarh state.

METHODOLOGY

In the present investigation, *Ex-post facto* research design was employed. This design was appropriate because the phenomenon had already occurred. *Ex-post-facto* research is the most systematic empirical enquiry in which the researcher does not have any control over independent variables as their manifestation has already occurred or as they are inherent and not manipulatable thus, inferences about relations among variables were made without direct intervention from concomitant variation of independent and dependent variables. The study was conducted in Bilaspur district of Chhattisgarh state during the year 2014-2015. Bilaspur district was selected purposively because the maximum tribal population is residing in Chhattisgarh plains, comes under this district. Out of total 7 blocks in the Bilaspur district, *Pendra, Gaurela* and *Kota blocks* were selected purposively because maximum numbers of tribes are residing in these blocks. Three villages were selected randomly from each selected block to make a total of 9 villages in the sample. 15 NTFPs gathering tribes were selected randomly from each selected village. In this way total 135 NTFPs gathering tribes (9 x 15=135) were considered as respondents for this study. The data were collected personally in cooperation with forest officers and other officials of the district by using pre-tested interview schedule.

Enumeration of economic contribution

Economic contribution made by each 24 collected NTFPs was worked out with the help of following formula and it is expressed in per cent (%)

$$\text{Economic contribution (\%)} = \frac{\text{Total annual income obtained from particular NTFP}}{\text{Total annual income obtained from all selected NTFPs}} \times 100$$

Enumeration of employment generation

For calculating the normal employment generated (days/year/family) by a particular NTFP the multiplication had been made between average family members involved in per day collection of that particular NTFP and average number of days devoted in a year by each person in collection of the same NTFP.

For determining the average time devoted by each family in a year in collection of a particular NTFP, multiplication had been made between average family members involved in per day collection of that particular NTFP and average number of days devoted in a year by each person in collection of the same NTFP. Then outcome of this multiplication was again multiplied with the average time devoted by per person per day in collection of that particular NTFP.

For calculating the generated man days employment (@ 6 hrs/day/year/family) by a particular NTFP, the average time devoted by each family in a year in collection of a that particular NTFP was the divided with 6 hrs. While for determining the generated man days employment (@ 6 hrs/day/year/ person) by a particular NTFP, the per family generated man days employment by that particular NTFP in a year was divided by average family members involved in per day collection of the same NTFP.

RESULTS AND DISCUSSION

Availability period of various NTFPs

Month wise availability of various collected NTFPs is presented in the Table 1. The findings reveled that out of 24 collected NTFPs, 16 NTFPs were available in the month of April to June.

The name of those products were as follows *mahua, char beej, tendu, tendupatta, jamun, sahad, aam, ber, bel, emli, sahatoot, kathal, salbeej, gond,*

Table 1: Month wise availability of various NTFPs

Local name	Scientific name	Month of availability
Mahua	*Madhuca longifolia*	March-April
Char beej	*Buchanania lanzan*	April-May
Putu and *Chhatani*	*Scleroderma spp.* & *Termitomyces spp.*	July-September
Tendu	*Diospyros melanoxylon*	May-June
Tendupatta	*Diospyros melanoxylon*	April-May
Sitaphal	*Annona squamosa*	October-November
Jamun	*Syzygium cumini*	June-July
Bihi	*Psidium guajava*	November-February
Sahad (Honey)	-	March-June
Aam	*Mangifera indica*	May- June
Ber	*Ziziphus mauritiana*	March-April
Bel	*Aegle marmelos*	May-June
Kheksha	*Momordica subangulata*	September –October
Emli	*Tamarindus indica*	March- April
Aawla	*Phyllanthus emblica*	October-December
Sahatoot	*Morus nigra*	June-July
Kathal	*Artocarpus heterophyllus*	April-May
Jimikand	*Amorphophallus paeoniifolius*	October-November
Sal beej	*Shorea robusta*	April-May
Gond (Gum)	-	May-June
Harra	*Terminalia chebula*	December- January
Bahera	*Terminalia bellirica*	December- January
Lakh (Lac)	-	May-June
Bhelwa	*Semecarpus anacardium*	May-June

lakh and *bhelwa*. It might be due to the fact that this period was the peak period of natural availability of such NTFPs. While from the remaining 8 NTFPs, NTFPs such as *bihi* was available in November to February, *putu* and *chhatani* in July to September, *sitaphal* and *jimikand* in October to November, *harra* and *bahera* in December to January, *aawla* October to December and *kheksha* in September to October. So, based on this data it can be inferred that the NTFPs were available almost throughout the year. Shit and Pati (2012) revealed that in Paschim Medinipur district of West Bengal majority of the NTFPs were available in the forest during the month of April to December.

Number of households involved in collection of various NTFPs and economic contribution made by various NTFPs in livelihood system of the respondents

Number of households involved in collection of various NTFPs is exhibited in Table 2. The result reveals that all sample households (135) were involved in *mahua* collection followed by collection of *aam, jamun* and *tendupatta* in which total 130, 129 and 128 numbers of households were involved. This might be because of the importance of such collected NTFPs in the livelihood of the respondents and the availability of such collected NTFPs in the study area. Singh *et al.* (2010) identified that in

Table 2: Number of households involved in collection of NTFPs and economic contribution made by various NTFPs in livelihood system of the respondents

Name of NTFPs	Number of households involved in collection*	Total annual income from each NTFP (Rs.)	Percentage economic contribution from each NTFP (%)
Mahua	135	293765.40	23.56
Char beej	65	125364.20	10.05
Putu and *Chhatani*	102	24639.12	1.98
Tendu	112	20587.84	1.65
Tendupatta	128	227827.20	18.27
Sitaphal	125	49271.25	3.95
Jamun	129	47060.49	3.77
Bihi	123	43109.04	3.46
Sahad	31	56250.12	4.51
Aam	130	191943.70	15.39
Ber	76	11650.80	0.93
Bel	30	1359.30	0.11
Keksha	7	574.28	0.05
Emli	27	15524.46	1.25
Awala	25	12481.50	1.00
Sahatoot	6	1939.44	0.16
Kathal	17	6435.52	0.52
Jimikand	2	424.96	0.03
Sal beej	70	36350.30	2.92
Gond	10	18889.80	1.51
Harra	53	33056.10	2.65
Behara	20	6040.00	0.48
Lakh	14	7909.16	0.63
Bhelwa	28	14475.16	1.16
Total	1246929.14	100.00	

*Data are based on multiple responses

Mangrove forest of Sundarban nearly 19-25% of the households were engaged in fishing followed by firewood (15-22%), both honey and wax collection (15-21%) and 10-19 per cent in prawn collection. While almost7 per cent and 9 per cent were engaged in pati grass collection and crab collection, respectively.

With regard to economic contribution made by various NTFPs in livelihood of the respondents is also presented in Table 2. It can be observed from the Table 2 that total income earned in a year by the selling of all collected NTFPs among the all sample households was ` 1246929.14. In which maximum economic contribution, i.e. 23.56 per cent was comes from *mahua*. This might be due to the fact that most of the respondents were sold out much higher quantity of *mahua* than the other NTFPs. After *mahua*, maximum economic contribution comes from *tendupatta* (18.27%) followed by *aam* (15.39%) and *char* beej (10.05%). While the rest of 32.73 per cent economic contribution came from the remaining 20 NTFPs. Bhattacharya and Hayat (2004) reported in Sheopur district of Madhya Pradesh thatin terms of economic contribution, average estimated household income from NTFPs was ` 14610 (about US$300) per year. He is also observed that maximum economic contribution comes from *salai* gum i.e. ` 4,500. This finding are also supported by the Kant and Mehta (1993) and Baldewa (2011).

Employment generation by the collection of various NTFPs

Employment generated by the collection of individual NTFP is presented in the Table 3. The average family size in the study area was 5.69 members. In respect of average family members involved in per day collection of particular NTFPs, it was found that maximum average family members(4.17 members) were involving in per day collection of *sahatoot* followed by *tendupatta* (4.11

Table 3: Employment generated to the respondents by the collection of individual NTFP

Name of Particular NTFPs	Average family members involved incollection (per day)	Average number of days devoted in collection (per person per year)	Normal employment generated (days/ year/family)	Average time devoted in collection		Generated man days employment(@ 6 hrs /day) /year	
				hrs/day/person	hrs/year/family	Per family	PerPerson
Mahua	4.09	13.14	53.72	1.32	70.91	11.82	2.89
Char beej	3.12	5.05	15.76	0.67	10.56	1.76	0.56
Putu and *Chhatani*	3.23	3.84	12.39	0.61	7.56	1.26	0.39
Tendu	1.96	3.70	7.25	0.65	4.71	0.79	0.40
Tendupatta	4.11	12.03	49.43	1.45	71.67	11.95	2.91
Sitaphal	2.34	4.54	10.60	0.71	7.52	1.25	0.54
Jamun	2.37	4.71	11.17	0.74	8.26	1.38	0.58
Bihi	2.20	4.43	9.72	0.68	6.61	1.10	0.50
Sahad	1.35	3.35	4.55	0.83	3.77	0.63	0.46
Aam	2.84	6.75	19.15	0.78	14.94	2.49	0.88
Ber	2.16	3.87	8.35	0.56	4.67	0.78	0.36
Bel	1.40	2.70	3.78	0.52	1.97	0.33	0.23
Kheksha	2.14	2.19	4.69	0.63	2.96	0.49	0.23
Emli	1.81	2.67	4.84	0.53	2.56	0.43	0.24
Aawla	2.80	4.60	12.88	0.55	7.08	1.18	0.42
Sahatoot	4.17	4.78	19.91	0.62	12.34	2.06	0.49
Kathal	1.71	3.73	6.36	1.19	7.56	1.26	0.74
Jimikand	1.50	3.00	4.50	0.64	2.88	0.48	0.32
Sal beej	3.54	8.03	28.46	0.77	21.91	3.65	1.03
Gond	2.60	7.43	19.33	0.72	13.92	2.32	0.89
Harra	3.64	7.08	25.79	0.67	17.28	2.88	0.79
Bahera	3.05	5.87	17.89	0.63	11.27	1.88	0.62
Lakh	2.79	4.60	12.80	0.94	12.03	2.01	0.72
Bhelwa	3.54	6.86	24.24	0.68	16.49	2.75	0.78

Note : Man days employment calculated on the basis of 6 hrs/day

members), *mahua* (4.09 members) and *harra* (3.64 members). Whereas, minimum average family members i.e. 1.35 members were involving in per day collection of *sahad*. While, with regard to average number of days devoted in collection (per person per year) the data shows that the respondents were devoting maximum 13.14 days in collection of *mahua* followed by *tendupatta* (12.03 days), *sal beej* (8.03 days) and *gond* (7.43 days). It might be due to the fact that *mahua* and *tendupatta* were available to respondents in the plentiful amount. They had devoted least number of days (2.19days) in the collection of *kheksha*.

In respect of normal employment generated by an individual NTFP, the data shows that maximum employment generated (per family per year) by *mahua* (53.72 days). It might be because of the abundant availability of *mahua* in the study area. After *mahua*, maximum employment generated (per family per year) by *tendupatta* (49.43 days) followed by *sal beej* (28.46 days) and *harra* (25.79 days). The minimum employment generation was recorded in the case of bel (3.78 days). However it was also found that total normal employment generated by the all 24 collected NTFPs (per family per year) was 387.54 days. This is greater than number of days in a year (i.e. 365 days). It might be because of the fact that respondents were engaged in collection of several (more than one) NTFPs during the same period of a year.

It was also observed that on an average basis each day each person had devoted maximum time (1.45 hrs/day) in the collection of *tendupatta* followed by *mahua* (1.32 hrs/day). Whereas in the case of average time devoted (hrs/year/family) in collection of various NTFPs it was found that the respondents were devoted maximum time (71.67 hrs/year) in the collection of *tendupatta* followed by *mahua* (70.91hrs/year). The reason behind these results might be because of the fact that picking of quality *tendupatta* take more time in comparison of the time required for the collection of other NTFPs.

With regard to employment generation (@ 6 hrs/day/year/family), the findings elucidate that maximum man days employment (11.95 man days) was generated to each family in a year by the collection of *tendupatta* followed by *mahua* (11.82 man days), *sal beej* (3.65 man days) and *harra* (2.88 man days). Whereas the minimumman days employment was generated to each family in a year by *bel* i.e. 0.33 man days.

Similarly, man days employment generated (@ 6 hrs/day/year/person) it was recorded that maximum man days employment generated to each person in a year by *tendupatta* (2.91 man days) followed by *mahua* (2.89 man days), *sal beej* (1.03 man days) and *gond* (0.89 man days).

While the minimum man days employment generated to each person in a year by *kheksha* (0.23 man days). However, employment generated with regard to man days/year/family and man days/year/person was maximum in the case of *tendupatta* but average number of days devoted in collection (per person per year) was maximum in the case of *mahua*. Mistry (1992) observed that tendu leaf collection was observed to provide about 90 days of employment to about 7.5 million people every year in India.

In the similar fashion distribution of the respondents according to overall normal employment generated per year by the collection of various NTFPs is presented in the Table 4. The data describes that majority of the respondents (88.89%) were got the 75 to 150 days of employment per year by the collection of various NTFPs. This might be due to the fact that various NTFPs were available to most of the respondents in different seasons of a year. However, 7.41 per cent of the respondents were got less than 75 days of employment, while only 3.70 per cent were got above 150 days of employment per year. Kant and Mehta (1993) found that, on an average, each person was employed for about 128 man days in a year in the collection of the NTFPs. Almost similar findings were also reported by Acharya (2013).

Table 4: Distribution of the respondents according to overall normal employment generated by the collection of various NTFPs (per year)

Particular	Frequency	Percentage
Less than 75 days	10	07.41
Between 75 to 150 days	120	88.89
Above 150 days	05	03.70

Correlation analysis of factors associated with employment generation by NTFPs

Table 5 represents the correlation analysis of factors associated with employment generation by NTFPs. Correlation coefficient was worked out to identify the degree of association or relationship between the employment generation by NTFPs and different factors which is associated with it.

It was found from the data that out of eleven factors, the factors viz., marketing pattern of NTFPs and extent of sustainable livelihood was found to be positive and having highly significant correlation at 0.01 level of probability. While variable, sources of information was found to be positive and significantly correlated at 0.05 level of probability. It means that if marketing pattern of NTFPs, extent of sustainable livelihood and sources of information get increases then employment generation by NTFPs will also increases and vice versa. Variables viz. social participation and size of land holding were found to be negative and having highly significant correlation with employment generation by NTFPs at 0.01 level of probability. The negative correlation between social participation and employment generation by NTFPs might be because of the fact that as the involvement of tribes increases in different social activities then they have devoting less time in NTFPs collection. Hence the employment generated by NTFPs will decreases for them. The negative correlation indicates that if variables i.e. social participation and size of land holding are increases then employment generation by NTFPs will decreases and vice versa. Whereas, remaining six variables namely family size, experience in collection of NTFPs, occupation, livestock possession, expenditure pattern and annual income were exhibits non-significant correlation with employment generation by NTFPs.

Table 5: Correlation analysis of factors associated with employment generation by NTFPs

Factors	Coefficient of correlation "r" value
Family size	-0.109 (NS)
Social participation	-0.221**
Experience in collection of NTFPs	0.081(NS)
Occupation	0.061(NS)
Size of land holding	-0.258**
Livestock possession	-0.086 (NS)
Expenditure pattern	-0.115 (NS)
Marketing pattern of NTFPs	0.654**
Sources of information	0.213*
Annual Income	0.038 (NS)
Extent of sustainable livelihood	0.312**

*Significant at 0.05 level of probability ("r" value = 0.168) NS = Non-Significant

** Significant at 0.01 level of probability ("r" value = 0.219)

CONCLUSION

From the findings of this study it can be concluded that hence the various NTFPs were available almost throughout the year in the same or different seasons. Therefore the tribes were engaged themselves in collection of various NTFPs throughout the year for sustaining their livelihood. The collection of such NTFPs empowers the tribes economically by augmenting the annual income and by generating the employment throughout the year. Especially in lean agricultural period i.e. April to June, when most of the rainfed tribal farmers were remains unemployed.

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