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Role of socio-economic variables and non-timber forest products on the livelihood dependency of forest fringe communities in Khordha forest division, Odisha

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ABSTRACT

The objective of the paper was to analyze the socio economic status of forest fringe communities in Khordha Forest Division of Odisha. The study was based on primary data collected from villages in two Ranges namely, Balugaon and Ranpur range in Khordha Forest Division. Hundred respondents were randomly selected, data were collected through a structured survey questionnaire, analyzed with appropriate statistical methods and were interpreted in accordance with the objectives of the study. In the study area, it was found that the tribal males of age group 18-40 years were involved in non-timber forest products (NTFPs) collection. Generally, married persons were involved in the NTFPs collection to support their family with around family size of 4-8 members. We found that 80% of the respondents belonged to landless, marginal and small land holding, because of the small land holding category. The poor condition of the people also influenced the house type i.e. 73% of respondent's possessed kutcha house and semi-pucca house.

Key words: Forest, forest produce, livelihood, NTFPs, socioeconomic variables

INTRODUCTION

Non-timber forest products (NTFPs) play an important role in the livelihood of the rural people living near the forest. Forest acts significantly in the life of landless and tribal people for income generation and food from forest (Singh et al., 2010; Ahenkan and Boon, 2011). NTFPs include wild edible fruit, mushroom, berry, root, tuber and green or vegetable etc. to meet the food requirements of the rural people. According to the World Resource Institute (1990), NTFPs provide livelihood to nearby 500 million people in India (MoEF, 1996).

India is a developing nation with a huge population living close to the forest with their livelihood critically linked to the forest ecosystem. The forest fringe communities do not just collect these forest products for their own consumption but also for commercial sale, which fetch them some income. Forest sector is the second largest land use system after the agriculture. Forests contribute 1.7% GDP of the country (FAO, 2016). People living in the forest fringe villages depend upon forest for a variety of goods and services. These include collection of edible fruits, flowers, tubers, roots and leaves for food and medicines, firewood for cooking, small woods for agricultural implements, house construction and fencing, fodder (grass and leave) for livestock and grazing of livestock in forest, collection and marketing of NTFPs (Parkash et al., 2006; Mukul et al., 2016). Similarly, sustainable use of sal leaves, twigs of different bushes for fodder, barks of medicinal plants, bamboo and cane may provide income to the rural people without affecting the forest.

MATERIALS AND METHODS

The investigation was conducted during 2019 in Balugaon and Ranpur Forest Range of Khordha Forest Division, Odisha, selected randomly for

the purpose of study. Total 10 villages, five from each range, and four reserve forests were selected for the study of socio economic profile, utilization, dependency and marketing of forest products of the forest fringe villages. All the households have been randomly selected from the village. A total of 100 families from 10 villages belonging to four reserve forests of the division were taken. The data were collected through a structured survey questionnaire, analyzed with appropriate statistical methods and were interpreted in accordance with the objectives of the study. The data was collected personally through a semi-structured schedule pretested earlier. The statistical tools such as percentage, mean score, standard deviation, co-efficient of variation and co-efficient of correlation were employed for the analysis and interpretation of data.

RESULTS AND DISCUSSION

Different socio-economic characteristics like family size, age, caste, gender, literacy, land holding size, marital status, ownership, employment status, livestock, occupation and income were analyzed. The study on age group revealed that all age group categories of people were involved in NTFP collection although the majority of respondents were in the age group of 18 to 40 (50%) out of which 67 % were male and 33% female in the study area. Out of the respondents, 77% belonged to scheduled tribe, 14% scheduled caste, 6% other backward caste and 3% general caste. Maximum numbers of respondents were married (65%), unmarried (23%), widow (11%) and divorcee (1%). The literacy level in the study area was in the order illiterate (28%), primary (62%), high school and above (10%). The overall high literacy rate might be due to government educational programs and mid-day meal facilities of the government for encouraging student attendance. Majority of the population are of nuclear family (58%) and rest in joint family (42%). Maximum number of family members constituting 4 to 8 in a group (51%) were involved in the NTFP collection, up to 4 numbers (40%), 8 to 12 numbers (9 %). Maximum number of respondents had marginal land holding, i.e. 1 to 2 ha (44%), landless (36%) and small (20%). 58% of the respondents were owner of land, 22% had leased in, 12% had leased out and 8% owner and leased out. 64% of respondents had non-irrigated land while 36% had irrigated land. We observed that maximum of 43% respondents had kaccha house, semi pucca (30%), thatched house (19%) and minimum number of pucca house (8%) in the study area. Maximum number of people were self-employed (39%), followed by part time employment (31%) and unemployed (30%) and majority were involved in agriculture, NTFPs and labour (72%). Multiple sources like family occupation, business, service and cattle rearing were diversified occupation. Maximum number of people's (69%) income lies between Rs 10000/- to 25000/-. Maximum people depends on agriculture, NTFPs and labour for income generation (Ahenkan and Boon, 2011). More than 31% of livestock was cow followed by hen (27%), goat (23%) and ox (19%) in the study site.

Correlation among different socio-economic variables

Perusal of the Table 2 showed that age was significantly and positively correlated with literacy (0.214*), land holding (0.397**), type of ownership (0.381**) and negatively correlated with household type (-0.237*). Literacy had shown significant and positive correlation with family member (0.347**), land holding (0.493**), type of ownership (0.460**) and income (0.333**), but negatively correlated with type of land (-0.264**). Family type had significant and correlate positively correlation with family member (0.528**), land holding (0.531**), and income (0.538**). Family member was significantly and positively correlated with land holding (0.257**), type ownership (0.331**), household type (0.329**) and income (0.535**). Land holding was positively correlated with income (0.474**). Type of ownership was positively correlated with household type (0.225*) and negatively correlated with type of land (-0.227*). Type of land was significantly positively correlate with caste (0.206*) and negatively correlated with household type (-0.420**). Household type was significantly and negatively correlation with occupation (-0.220*). Employment status significantly and positively correlated with

Table 1. Socio-economic profile of the NTFPs collection: (n=100)

Sl. no	Socio-economic characteristics	Number	Percentage
1	Age of the respondents		
	0-18	07	7.0
	18-40	50	50.0
	40-60	36	36.0
	>60	08	8.0
2	Gender of the respondents		
	Male	67	67.0
	Female	33	33.0
3	Caste of the respondents		
	General	03	3.0
	OBC	06	6.0
	SC	14	14.0
	ST	77	77.0
4	Marital status of the respondents		
	Divorcee	01	1.0
	Widow	11	11.0
	Single	23	23.0
	Married	65	65.0
5	Literacy of the respondents		
	Illiterate	28	28.0
	Primary	62	62.0
	High school and above	10	10.0
6	Family type		
	Joint	42	42.0
	Nuclear	58	58.0
7	Family member of the respondents		
	4 to 8 members	51	51.0
	8 to 12 members	9	9.0
	up to 4 members	40	40.0
8	Land holding of the respondents		
	Landless	36	36.0
	Marginal	44	44.0
	Small	20	20.0
9	Ownership of the respondents		
	Leased in	22	22.0
	Leased out	12	12.0
	Owner	58	58.0
	Owner and leased out	08	8.0
10	Types of land		
	Irrigated	36	36.0
	Non-irrigated	64	64.0
11	Types of house		
	Kutcha House	43	43.0
	Pucca	8	8.0
	Semi Pucca	30	30.0
	Thatched House	19	19.0
12	Employment status		
	Part time employed	31	31.0
	Self employed	39	39.0
	Unemployed	30	35.0
13	Occupation		
	Agriculture +NTFPs + Labour	72	72.0
	NTFPs+ Agriculture + Business	09	9.0
	NTFPs +Labour +Family Occupation	09	9.0
	Business + Agriculture +Cattle Rearing	04	4.0
	NTFPs +Agriculture + Government service	06	6.0
14	Income		
	<10,000	16	16.0
	10,000-25,000	69	69.0
	25,000-50,000	15	15.0
15	Livestock	Mean	
	Cow	2.18	31.0
	Ox	1.32	19.0
	Goat	1.56	23.0
	Hen	1.88	27.0

Table 2. Correlation among different socio-economic variables

	Age	Literacy	Family Type	Family Member	Land Holding	Types of Ownership	Types of Land	Household Type	Emp. Status	Income	Livestock	Gender	Cast	Marital Status	Occupation
Age	1														
Literacy	0.214*	1													
Family type	0.187	0.066	1												
Family member	-0.014	0.347**	0.528**	1											
Land holding	0.397**	0.493**	0.531**	0.257**	1										
Types of ownership	0.381**	0.460**	0.163	0.331**	0.188	1									
Types of land	0.141	-0.264**	0.016	-0.117	-0.070	-0.227*	1								
Household type	-0.237*	0.092	-0.029	0.329**	-0.115	0.225*	-0.420**	1							
Employment status	-0.085	-0.156	0.077	-0.003	0.017	0.018	0.192	0.118	1						
Income	0.183	0.333**	0.538**	0.535**	0.474**	0.060	0.135	0.061	0.203*	1					
Livestock	-0.030	0.135	0.096	-0.064	0.094	0.081	-0.086	0.051	-0.034	-0.035	1				
Gender	-0.016	0.095	0.004	0.109	-0.007	0.052	-0.019	-0.063	-0.126	-0.064	-0.131	1			
Caste	0.195	0.050	0.018	0.039	0.024	-0.093	0.206*	-0.136	0.019	0.222*	0.040	-0.088	1		
Marital status	-0.147	0.065	-0.036	-0.107	-0.113	0.057	-0.110	0.174	-0.015	-0.092	-0.016	0.080	-0.180	1	
Occupation	0.115	0.003	0.023	-0.033	0.008	0.105	0.000	-0.220*	-0.055	0.024	0.064	-0.014	0.178	-0.032	1

*Correlation is significant at the 0.05 level (2-tailed); **Correlation is significant at the 0.01 level (2-tailed).

income (0.203*). Income had significant and positive correlation with caste (0.222*). Livestock, gender and marital status had not shown significant, correlation with any other socio economic parameter.

Age was positively correlated with land holding and type of ownership which indicates the aged persons have more assets compared to young age people and was negatively correlated with household type which might be due to prevalence of the nuclear family in the study site. Literacy level was found to be positively correlate with land holding and income which indicated the educated mass have awareness about the different income generating activities. Family type had significant positive effect on family member, land holding and income of the family. Family member is positively correlated with land holding, household type and family income. Land holding was positively correlated with family income as majority of the respondent were depend upon agriculture as agriculture is the dominant livelihood.. Type of ownership was negatively correlated with type of land and household type. Household type was negatively correlated with occupation. Employment status was positively correlated with income. Income was positively correlated with caste. The status of employment determined the income of household.

Interpretation of Table 3 showed that NTFPs collection was significant and positively correlated with livestock rearing (0.275*) and negatively correlate with labour (-0.118*) and family occupation (-0.306**). Agriculture was significantly and positively correlated with other (services) (0.190*) and negatively correlated with labour (-0.236**). Labour was significantly and positively correlated with family occupation (0.204*), other (services) (0.367**) and negatively correlate with livestock rearing (-0.317**).

NTFPs collection was positively correlated with livestock rearing which might be due to rural people collect fodder for their livestock and also collect NTFPs while accompanying their livestock for grazing. NTFPs collection was negatively correlate with labour wages and family occupation which might be due to the people were more engaged in NTFPs collection due to lack of labour engagement . Agriculture was positively correlated with other (services) which might be due to the fact that those who were in service investing agriculture production from their land. Labour wages was negatively correlated with livestock rearing which indicates people who were engaged in labour activities gets less time for livestock rearing but prefers to go to forest for NTFPs collection.

Contribution of various sectors in employment generation is as follows- the maximum of 53.15 days per household (HH) per year (27.82 %) was in agriculture followed by NTFPs collection (24.79 %), labour (23.92 %), family occupation (9.73 %), livestock rearing (5.91 %) and services (7.80 %). It was inferred from the above data that agriculture, NTFPs collection and labour engagement and family occupation were the major livelihood and income generating activities in the study site as agreed by many earlier reports (Shaanker et al., 2004; Kar, 2012; Ahmed et al., 2016). Agriculture NTFPs collection and findings labour engagement were the major employment generation activities which was similar to the findings Kumar (2015) who reported an average employment of 115.56 and 77.81 man days per HH per year from wage sector and NTFP, respectively.

Perusal of data in Table 5 indicated that collection of sal leaves gave the major employment sources among the different NTFPs. It contributes to 5.67 days per HH per year of the total employment generated by NTFPs (47.35 days per HH per year). Siali leaves collection was the next important employment generating activity (5.62 days per HH per year) followed by collection of sal seed (5.28), cane berries (5.25), cane culm (4.37), tamarind (4.31), cherenga (4.28), honey (3.44), amla (2.58), mushroom (2.18), bahada (2.02), kochila seed (1.33), and harida (1.02). Sal leaves (11.97%), siali leaves (11.86%), cane berries (11.08%), cane culm (9.22%), tamarind (9.10%) and cherenga (9.03%) were the dominant NTFPs collected by the rural people among all NTFPs. Indigenous people depend on NTFPs and their livelihood sustainability depend

Table 3. Correlation of different income sources

	NTFPs Collection	Agriculture	Labour	Family Occupation	Livestock Rearing	Others
NTFP Collection	1					
Agriculture	0.075	1				
Labour	-0.118*	-0.236**	1			
Family occupation	-0.306**	0.029	0.204*	1		
Livestock rearing	0.275*	0.065	-0.317**	-0.158	1	
Others	-0.093	0.190*	0.367**	0.179	-0.183	1

Table 4. Composition of employment in different sector

Activities	Employment generated (days per household per year)	Percentage (%)
NTFP Collection	47.35	24.79
Agriculture	53.15	27.82
Labour	45.70	23.92
Family occupation	18.60	9.73
Livestock rearing	11.30	5.91
Others	14.90	7.80
Total	191.00	100.00

Table 5. Seasonal contribution of employment from different NTFPs

Sl. no	NTFPs	Season	Employment generated (days per household per year)	Percentage (%)
1	Siali leaf	October -May	5.62	11.86
2	Honey	November –June	3.44	7.26
3	Cane culm	March-April	4.37	9.22
4	Cane berries	February-March	5.25	11.08
5	Harida	November -January	1.02	2.15
6	Bahada	January -April	2.02	4.26
7	Amla	February –March	2.58	5.44
8	Sal leaf	All season	5.67	11.97
9	Sal seed	April-June	5.28	11.15
10	Mushroom	June-August	2.18	4.60
11	Kochila seed	December –January	1.33	2.80
12	Tamarind	March-April	4.31	9.10
13	Cherenga	December – May	4.28	9.03
	Total		47.35	100.00

upon forest and forest produce (Shahbuddin and Prasad, 2004; Shylajan and Mythili, 2007; Bharat Kumar et al., 2011; Mohanta et al., 2018).

CONCLUSION

This study goals to highlight the significance of NTFPs in the livelihood of forest dependent communities and some strategies for their sustainable development and judicial utilization. NTFP contributes a lower proportion of total household income (about 24%) than agriculture (27%), it acted as safety nets in times of food scarcity and during off seasons where agricultural and wage income was nil. NTFP played a prominent role in both life and livelihood support for the villagers. Socio-personal, agro-economic and psychological attribution very often motivate the people for proper management and sustainable use of forest resources. The respondents depending on forest for livelihood support were mostly 18-40 years, primary to illiterate educated, within family size of 4-8 members, agriculture and collection of forest produce as the major occupation. After agriculture, NTFP collection was the most important activity among the respondents as all of them in the area were involved in this activity. The findings conclude that the respondents depend on forest for their livelihood. The forest department officials need to sensitize these people for proper management of the forest and collection of non- timber forest produce.

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