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Socio- economic Factors Determining Extraction of Non-timber Forest Products in the Jammu Region of Jammu and Kashmir

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***Abstract*:** Non-timber forest products (NTFPs) from natural forests provide significant benefits to forest dwellers. This study was conducted in the Jammu Region of Jammu and Kashmir, India assuming that the extraction of NTFPs by forest dwellers is related to income, age, type of family, education, land holding occupation and distance from the forest. The 150 NTFP collectors and 150 non- collectors from three forest divisions of Jammu region were interviewed. There was significant difference between the NTFP collectors and non- collectors in case of socio-personal variables of age, farming experience, type of house, number of MGNERGA card holders, type of ration card, formal education, literacy rate and sex ratio. The binary regression model was used to identify factors that affect the participation of households in collection of NTFPs. Independent variables, age of respondent, education of respondent, type of house, occupation, and irrigated land holding negatively and significantly affected the dependent variable. The extension contact, source of information, off farm income, literacy index and family size positively and significantly affected the NTFP extraction.

***Keywords*:** Non-timber forest products, Collection, Socio- economic factors, Income

Non-Timber Forest Products (NTFPs) refer to a wide array of economic or subsistence materials that come from forests, excluding timber. These are also termed as non-wood, minor and secondary forest products. They include a wide range of edibles and non-edibles such as fruits, seeds, leaves, nuts, bush meat, roots, tubers, fibres, resins, latex, sticks, ropes, and construction materials like bamboos and rattans and a host of others. All these are an important source of livelihoods for the rural populations all over the world. Households often rely on resources available in the vicinity of forest, such as wood for cooking, heating, and construction (Naughton-Treves et al 2007) or forage for livestock. World Bank (2004) reported that the number of forest-dependent people globally to be 1.6 billion. Dependence of forest dwellers on forest resources differs greatly among individuals in terms of tribe, caste, class, and among and within communities and households by sex and age (Babulo et al 2009). Older people may possess superior knowledge than younger community members about medicinal plants, their uses and may collect more medicinal plants and wild foods (Ndagalasi et al 2007). The higher education provides opportunities for better jobs and reduces the households dependency on NTFPs, hence they are less interested in collecting NTFPs. (Adhikari et al 2004). Ravi et al (2006) studied the role of NTFPs in the life and economy of the tribal community living in and around the protected forests of H.D. Kote region. The presence of an additional individual in the household increases the household probability of collecting NTFPs. Household members can also provide labour that may help in collecting NTFPs. The contribution of forests to local livelihoods and to the national economy is significant but largely undocumented. In this research addressed socio economic factors affect the participation of households in collection of NTFPs.

MATERIAL AND METHODS

The present study was conducted in forest area of Jammu region of Jammu and Kashmir (33.2778° N, 75.3412° E). Multistage sampling plan was followed for drawl of ultimate sampling units. The East circle from Jammu region was purposively selected as it covers all the three agro- climatic zones namely subtropical, intermediate and temperate, thus it represents the whole Jammu division. Three forest divisions; Basholi, Ramnagar and Udhampur were selected from East circle by employing random selection procedure without replacement. From each randomly selected forest division, one forest range having maximum NTFPs availability was selected. The available collectors were contacted with the snow ball sampling procedure. Thus from each selected forest range 50 collectors and 50 non-collectors were selected and interviewed, thereby making a total sample size of 150 collectors and 150 non- collectors.

Data were collected from the sampled respondent on the pre-tested interview schedule by contacting personally on their fields or at their homes. Analysis of collected data was performed using SPSS 16.0 (statistical package for social sciences) software.

RESULTS AND DISCUSSION

The average age of collectors was 40.58 years (Table 1). Majority of collectors (49%) belong to age group 36-54 years followed by 41 per cent in 18-36 years age group and 10 per cent in 54-86 years age group. In non- collectors, the average age was 48.19 years. Majority of non- collectors (45%) belong to age group 36-54 years followed by 30 per cent (54-86 years and 18-36 age group) 30 and 25 per cent. The difference in the mean age of the collectors and non-collectors was significant. The average farming experience of collectors and non-collectors was 22.62 and 27.80 years and was significant. The average NTFP collection experience of collectors was 17.19 years. As far as the type of house is concerned majority of the respondents including both collectors and non- collectors had *kacha* house and this may be due to the low annual income of respondents from different sources of income In case of collectors, 67 per cent had kisan credit card whereas 60 per cent of non- collectors had kisan credit card. There was no significant difference in collectors and non- collectors in case of kisan credit card. Therefore, two growers were matching on this parameter. The 71 per cent of collectors had PHH ration card while 29 per cent had NPHH ration card. The difference in collectors and non- collectors in case of type of ration card was significant. Type of family was categorized into nuclear and joint family, 60 per cent of the collectors lived in nuclear family, where rest lived in joint family. In non- collectors, majority 70 per cent of the respondents lived in nuclear family and 30 per cent of the respondents lived in nuclear family. The difference in the type of family of the collectors and non-collectors was not significant. Kumari et al (2021) reported in their study that about 32 percent of farming families lived in nuclear type.

There was a significant difference in the literacy rate of families of collectors than non-collectors. This might be due to the fact that NTFP collection activity is labour intensive activity (Hegde and Enters 2000) and thus the collectors less focus on education. However, literacy index varied from 2.35 to 1.82 among both the categories, with an overall index of 1.89. This highlighted that literacy rate was higher, however the level of education was poor as indicated by low literacy index. Similarly, Gupta et al (2019) observed 84.00 per cent

Table 1. Descriptive statistics regarding socio personal status of the respondent

Parameter	Collectors (n=150)	Non- collectors (n=150)	Difference (Percentage)	Statistics (*p*-value)
Mean age (years)	40.58±12.14	48.19±14.62	7.61	t= 4.231* (0.001)
Age group[1] (% farmers)				
18-36 years	41	25	16	z= 2.406* (0.020)
36-54 years	49	45	4	z= 0.567 (0.568)
54-86 years	10	30	10	z= 1.633 (0.103)
Average farming experience (years)	22.62±11.38	27.80±14.22	5.18	t= 3.603** (0.001)
Average NTFP collection experience	17.19±7.53	--		
Type of house (% farmers)				
Kacha	75	41	34	z= 4.871**
Semi-Pacca	25	35	10	z= 1.543 (0.123)
Pacca	0	24	24	z= 5.222**
Kisan Credit card holders (% farmers)	67	60	7	z= 1.028 (0.303)
MGNERGA card holders (% farmers)	95	75	20	z= 3.961**
Ration card holders (% farmers)				
PHH	71	51	20	z= 2.899**
NPHH	29	49		
Family type (% households)				
Joint	40	30	10	z= 1.480 (0.138)
Nuclear	60	70		

[1]Categorization was done through Singh Cube root method
*Significant at p≤0.05, **Significant at p≤0.01

respondents had level of education in between primary to higher secondary.

With respect to farm size of both the groups the average land holding was0.55 ha which is equal to erstwhile J&K state landholding i.e. 0.59 ha (Agriculture Census, 2015). Although the landholding was identical but the non-collectors were having other sources of income also like government service, labour, private sector (Table 3).

The occupational status of the collectors eleven per cent were solely dependent on NTFP income for their livelihood and only one per cent households of the non- collectors had agriculture as sole source of income for the household which suggests that dependency upon agriculture as the only source of income is decreasing as observed by earlier workers (Peshin et al 2014 and Nanda et al 2019). In addition to agriculture and NTFP collection 70 per cent of the collectors were labourers whereas only 28 per cent of the non- collectors were labourers. That the 13 per cent of the non- collectors were involved in government service or retired from government service and none of the collectors had served or serving in government service. This may be due to the continuation of ancestral traditional occupation of agriculture and NTFP collection and vice versa. There is less scope of employment in service sector as their education level is not high to get employment.With regards to extension contact 100 percent of the collectors contact Forest Department regarding NTFP activities (Table 5).

Categorization was done on the basis of level of source of utilization and observed that about half of the non-collectors (49%) fall in low source utilization category (0-5 sources) followed by 39 and 13 per cent, under medium (6-7 sources) and high source utilization (above 7 sources) categories, respectively.

The collectors' average annual households' income was Rs. 173650. In non- collectors, the average annual households' income was Rs. 246040with significant difference. The collectors' average off- farm annual household income was Rs. 110440and in non- collectors Rs.

Table 2. Educational status of respondents' household

Parameter	Collectors (n= 150)	Non- collectors (n= 150)	Difference	Statistics (*p*-value)
Mean education	6.07±3.66	7.33±4.29	1.26	t= 2.928** (0.003)
Education level (% respondents)				
Illiterate	19	18	1	z= 0.182 (0.857)
Below primary	7	1	6	z= 2.165* (0.030)
Primary	30	13	17	z= 2.926** (0.003)
Middle	26	34	8	z= 1.234 (0.218)
Matriculation	12	20	8	z= 1.543 (0.123)
10+2	5	7	2	z= 0.595 (0.548)
Graduation and above	1	7	6	z= 2.165* (0.030)
Literacy rate (Percent)	71.72	91.26	19.54	z= 3.460** (0.001)
Literacy Index	1.89 (Primary)	2.63 (Middle)	0.74	

*Significant at p≤0.05, **Significant at p≤0.01

Table 3. Distribution of respondents on the basis of their farm size

Parameter	Collectors (n= 150)	Non- collectors (n= 150)	Difference (Percentage)	Statistics (*p*-value)
Average operational farm size (ha)	0.55±0.54	0.52±0.38	0.03	t= 0.658 (0.511)
Categorization of farm size (% farmers)[1]				
Marginal (<1 ha)	86	80	5	z= 0.952 (0.342)
Small (1-2 ha)	12	18	6	z= 1.188 (0.234)
Semi- medium (2-4 ha)	1	1	0	--
Medium (4-10 ha)	1	1	0	--
Large (>10 ha)	0	0	0	--
Average irrigated area (ha)	0.02±0.08	0.05±0.12	0.03	t= 1.604 (0.109)
Average unirrigated area (ha)	0.52±0.53	0.46±0.31	0.06	t= 1.037 (0.301)

[1]Categorization of the farm size as per MOA (2011)

241480 with significant difference. Collectors' average on-farm annual household income was Rs. 31773. In case of non- collectors, the average annual on- farm households' income was Rs. 19292.6but with no significant difference in both groups on this parameter. The collectors' average annual households' NTFP income was Rs. 58584.4.

Decision to collect NTFPs depends upon so many factors such as age of respondent, education of respondent, type of house, occupation, and size of land holding, extension contact, source of information, off farm income, literacy index and family size etc. In the present study, age of respondent negatively and significantly affected thedecision to collect

Table 4. Occupational status of respondents

Parameter	Collectors (n= 150)	Non- collectors (n= 150)	Different	Statistics (*p*-value)
Respondents solely dependent on NTFP income (% farmers)	11	--		
Respondents solely dependent on farming	0	16		
Respondents having other sources of income	89	84	5	z= 1.035 (0.303)
Retired for government service	0	6	6	z= 2.487* (0.013)
Government service	0	10	10	z= 3.244** (0.001)
Labour	71	28	42	z= 5.941** (0.001)
Private	9	8	1	z= 0.254 (0.803)
Shop	9	32	22	z= 3.889** (0.001)

*Significant at p≤0.05, **Significant at p≤0.01

Table 5. Extension contact of sampled households

Extension contact#	Collectors (n= 150)	Non- collectors (n= 150)	Different	Statistics (*p*-value)
State Agriculture University	1	0	1	z= 0.582 (0.562)
Forest Department	100	83	17	z= 4.310**(0.001)
Department of Agriculture	99	100	1	z= 0.582 (0.562)

#Multiple responses
**Significant at p≤0.01

Table 6. Source of information of NTFP collectors

Source of information#	Collectors (n= 150)	Non- collectors (n= 150)	Difference	Statistics (*p*-value)
NTFP contractor	100	19	81	z= 11.667** (0.001)
Agriculture Input dealer	100	100	0	--
Progressive farmer	99	99	0	
Friends/ relatives	100	100	0	
Radio	1	11	10	z= 2.977** (0.002)
Television	17	19	2	z= 0.368 (0.711)
Newspaper	1	13	12	z= 3.325** (0.001)
Training	2	1	1	z= 0.582 (0.562)
Group meeting	100	100	0	--
Field visits	1	1	0	--
Demonstration	10	26	16	z= 1.262 (0.207)
Kisan mela	95	75	20	z= 3.961** (0.001)
Level of source of utilization* (% farmers)				
Low utilization (0-5 sources)	3	49	46	z= 7.415** (0.001)
Medium utilization (6-7 sources)	194	39	55	z= 8.239** (0.001)
High utilization (Above 7 sources)	3	13	10	z= 2.606** (0.010)

#Multiple responses
*Categorization was done by Mean± Standard deviation
**Significant at p≤0.01

Table 7. Source of income of sampled households (Rs/annum)

Parameter	Collectors (n= 150)	Non- collectors (n= 150)	Difference	Statistics (p-value)
Average annual household income	173650± 120575	246040± 288848.7	72390	t= 2.832** (0.005)
Average annual off farm income	110440±110438	241480± 288994.9	1031040	t= 5.187** (0.001)
Average annual on farm income	31773± 19486.4	19292.6± 20534.98	12480.4	t= 0.045 (0.963)
Average annual NTFP income	58584.4±49705.7	--		

**Significant at p≤0.01

Table 8. Socioeconomic variables determining participation of households in NTFP collection (Binary Logistic Regression)

Dependent variable	Independent variables	Coefficient (ß)	S.E.	Wald	*p*-value	Model summary
Participation in collection of NTFPs	Constant	-7.663	2.624	8.527	0.003	Nagelkerke R^2=.0.675 -2 Log likelihood= 204.022 χ^2=211.867 p =0.001
	Age (X1)	-0.096	0.022	18.185	0.001	
	Education (X2)	-0.296	0.080	13.697	0.001	
	Extension contact (X8)	3.676	1.181	9.690	0.002	
	Source of information (X10)	1.314	0.221	35.225	0.001	
	Off farm income (X14)	0.000	0.000	8.847	0.003	
	Type of house (X16)	-2.067	0.383	29.153	0.001	
	Literacy index (X17)	0.572	0.264	4.696	0.030	
	Primary Occupation (X9)	-1.294	0.654	3.911	0.048	
	Family size (X3)	0.252	0.121	4.365	0.037	
	Landholding (X6)	0.143	0.470	0.092	0.762	
	Irrigated landholding (X7)	-4.567	1.833	6.205	0.013	
	On farm income (X13)	0.000	0.000	0.466	0.495	
	Family type (X4)	0.817	0.524	2.431	0.119	

NTFPs which means only young people were involved in collection of NTFPs and may be due to the reason that collection area was far away from the home and had tough terrains and difficult for aged person to widely move in forest areas.NTFPs are important for poor households, for young age group persons in the area of study possible reasons for that they can improve their incomes through NTFPs selling. However, Rodrigez (2007) found that adult household heads were more likely to collect NTFPs in India. Many other researchers (Hedge et al 1996, Hedge and Enters 2000, Shone and Caviglia-Harris 2006) observed positive association between age and decision to collect NTFPs. Second factor was the education of respondent which negatively and significantly affected thedecision to collect NTFPs. Likewise literacy index of household also negatively and significantly affected thedecision to collect NTFPs. This indicate that due to low education level peasants did not get any employment in government or private sector so they were more involved in collection of NTFPs. Baldewa (2011) also observed that the majority of respondents who were involved in collection of NTFP, had low level of education.

Size of land holding and main occupation negatively ands ignificantly affected the decision to go for collection of NTFPs which indicate only those respondents who had less landholding size were involved in collection of NTFPs. Other factors which significantly affected the decision of NTFP collection were extension contact and source of information. NTFP collectors had more extension contacts and sources of information. This might be due to the fact that for the purpose of marketing of NTFPs collectors had to make more contacts in social system to access new information regarding new market avenues, selling price of NTFPs etc. NTFP collection significantly affected was larger family size because collection of NTFPs is labour intensive activity and more man power is required in different activities after collection like washing, processing, storage and marketing.

CONCLUSION

The study indicated that considerable socio- economic variables affecting collection of NTFPs in the selected forest divisions of Jammu region. Age of respondent, education of respondent, type of house, occupation, and irrigated land holding negatively and significantly affected the participation of households in collection of NTFPs. The extension contact,

source of information, off farm income, literacy index and family size positively and significantly affected the dependent variable.

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