



Factors influencing the collection of non-timber forest products by forest dwellers in Nagaland, India

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ABSTRACT: A study has been conducted to identify the factors influencing the collection of non timber forest products by forest dwellers in Nagaland. It was conducted in Mokokchung district of Nagaland. Out of 6 R.D.Blocks in the district, two blocks namely, Changtongya block and Ongpangkong N block were chosen purposively for the study. Proportionately 25% villages were selected from total 39 villages of both the blocks. Finally, 100 respondents were randomly selected from the selected 10 villages. Collected data were processed and analysed using simple analytical tools. Regression analysis was used in order to determine the factors influencing NTFPs income of sample households. Garrett ranking technique was also used to identify the factors influencing collection of NTFPs by sample households. It was found that majority of forest dwellers in Nagaland found to collect NTFPs mainly because of traditional norms followed by Naga society. At the same time people went for collection of NTFPs because NTFPs are good source of income as well as good source of food. Dependency ratio and employment from NTFPs were found significant factors and positively related with income from NTFPs. As the number of dependents increased, they went for NTFPs collection since they found it convenient compared to other activities. For every one percent increase in Dependency, income from NTFPs increased by Rs.279.33 and for every one man day increase in employment from NTFPs, NTFPs income increased by Rs. 554.08.

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1. INTRODUCTION

Non timber forest products which is also called as “Forest products other than timber” referred to all forest products such as grass, leaves, animal products, fruits and minerals other than major forest products. These are the biological resources of plant and animal origin, collected from forests. They are the constituents of the forest system that truly exist in nature and are normally not cultivated. This usually comprises of products which are used as cosmetics (oils), herbs, medicines, aromatic substances and flavourings, food, feed for animals, firewood, construction material, ornamental plants, paint and rubber, and also animal products from hunting (FAO, 1992). In India NTFPs contribute about 50% of the total forest revenue and 70% of the export income (Campbell, 1988). According to WHO, about 80% of the population of the developing countries depend on NTFPs for their primary health and special nutritional needs (Herdon and butler, 2010).

More than 800 types of NTFPs are harvested in India

(FSI, 2011). As the world advances in political economy of forest resources, the strength of NTFPs is progressively discussed in treasuring tropical forest. NTFPs are important source of income of the poor in many countries (Adepoju and Salau, 2007) as they provide employment opportunity to a large section of the tribals and other disadvantageous rural communities and comprises of 50% of the household income for approximately one third of India's rural population (ISFR, 2017). In this regard, the diversity of NTFPs and their role in the livelihood of local people constitutes a prime concern (Kanneboyena *et al.*, 2012). It is estimated that 275 million poor rural people in India, depend on NTFPs for at least part of their subsistence and cash livelihoods (Kumar 2015). NTFPs provide about 40% of total official forest revenues and 55% of forest - based employment (Tewari and Campbell, 1995).

According to Nagaland state action plan on climate change, 2012, NTFPs are decisive in meeting local communities' need for subsistence, providing a safety net in times of demand and accord to seasonal income. Nearly 60 percent of population living in and around forests in the state relies on NTFPs as a critical component for their sustenance. Since NTFPs include varieties of seasonal products, the returns from these are regular and quite continual. In addition to subsistence and income-generating potential, NTFPs

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also provide food security to large low-income populations. Therefore the study seeks to study the potential of NTFP and quantify the economic contribution, identification of products and season of collection to better understand the scope of agro-forestry in Nagaland.

2. MATERIALS AND METHODS

Present study on factor effecting NTFPs collection has been conducted in Mokokchung district of Nagaland. According to Census 2011, it is the 6th smallest district by area in the state having 1615 km² total geographical area representing 9.74% and the 5th most populous districts with a population of about 1.9 lakhs. The district has 6 R.D. Blocks and has a total of 108 villages out of which 107 villages are inhabited and 1 village uninhabited. The literacy rate in the district is 91.6% as per 2011 Census. Total number of normal households available in the district is 42,333 numbers.

Out of 6 R.D. Blocks in the district, two blocks namely, Changtongya block and Ongpangkong N block were chosen purposively for the study because of the availability of market outlets in these two blocks in comparison with the other blocks. In Changtongya and Ongpangkong N block, the total numbers of villages were 29 and 10 respectively. Proportionately 25% villages were selected from both the blocks based on the highest rural population among the villages in those two blocks. Hence, 7 villages from Changtongya block and 3 villages from Ongpangkong N block were randomly selected. A total of 100 respondents (solely dependent on NTFPs) from the 10 villages were selected. For the study, data were collected from primary as well as secondary sources. The primary data were obtained from the sample households by personal interview using well-structured questionnaires.

Factors influencing in NTFPs income by using multiple linear regression

To determine the factors influencing in NTFPs income by using multiple linear regression model was employed. The dependent variable i.e., the income generated from NTFP was regressed with the selected independent variables such as size of family, adult literacy, dependency ratio, income from agri., income from allied, income from wage employment and employment from NTFPs. The model is written as

$$y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i3} + \dots + \beta_p X_{ip} + \epsilon$$

3. RESULTS AND DISCUSSION

The following [Table 1](#) shows the details of factors influencing the income from NTFPs by respondent households through multiple linear regression model.

The result shows that the estimated values of regression coefficients for variables *viz.* size of the family, adult literacy, dependency ratio, income from agril., income from allied sources, income from wage and employment from NTFPs collection were -3061.21, 4.43, 320.19, -0.17, -0.04, -0.05 and 559.70 respectively and the constant value was 5743.63 for Changtongya block. Whereas for Ongpangkong N block, regression coefficients for respective variables were 2463.08, 385.83, -25.31, 0.07, -0.25, -0.06 and 500.2 respectively and the constant value was 34186.13. The R² values in both the blocks was 0.88. In total, the estimated values of regression coefficients for the above respective variables were -1882.04, 42.86, 279.33, -0.14, -0.12, -0.05 and 554.08, respectively. The constant value was 806.65 and the R² value was 0.87. When the calculated t- value was compared with the table t-value, it shows that in Changtongya Block, two variables *i.e.* dependency ratio and employment from NTFPs were found significant and positive and in Ongpangkong N block, two variables *i.e.* adult literacy and employment from NTFPs were found significant and positive. However, in total, dependency ratio alone had positive and significant relationship with NTFP income. [Pradhan \(1995\)](#) conducted similar type of study in Odisha and found that variables like land holding, number of female workers per family and household income excluding income from NTFPs reduced the probability of a household to go for collection of NTFPs while number of family members, number of male workers and size of livestock holding increased the probability.

It can be concluded that in Changtongya block, dependency ratio and employment from NTFPs were found significant and positively related with income from NTFPs. In Ongpangkong N block, adult literacy and employment from NTFPs were found significant and positively related with income from NTFPs. In total, dependency ratio was found significant and positively related with income from NTFPs. As the number of dependents increased, they went for NTFPs collection since they found it convenient compared to other activities. For every one percent increased in Dependency, income from NTFPs increased by Rs.279.33 and for every one man day increase in employment from NTFPs, NTFPs income increased by Rs. 554.08. [Hegde et al. \(1996\)](#) identified the factors influencing the collection of Non-Timber Forest Products (NTFPs) by tribal households of Biligiri Rangan hills of Karnataka and found that as the percentage of literate members in the family increased, the probability that the households will collect NTFPs decreased. While the family size influenced the collection of NTFPs positively, the income from other function had a negative impact on

the withdrawal of NTFPs. Similarly, Ganapathy (1998) in his study on collection and marketing of Non-Timber Forest Products (NTFPS) in Kollegal taluk of Karnataka analysed the factors influencing the collection of NTFPs. He reported that the type of family (Joint) and size of family (large) were positively related with NTFPs income while land holding and greater opportunities for wage complement were negatively related with NTFPs income. With regard to the probability of a household going for extraction of NTFPs, he reported that wage complement, land ownership and income from agriculture decreased the probability while joint family increased the probability of a household going for collection of NTFPs.

Factors influencing collection of NTFPs by sample households using Garrett Ranking

In order to identify the factors influencing the collection of NTFPs by sample households, Garret ranking technique was adopted and the result is presented below the Table 2. The study reveals that out of five factors identified by using Garret ranking in Changtongya Block, majority of the sample households went for NTFPs collection because of their traditional norms (score of 66%), followed by good source of income (score of 62%), availability of good source of food (score of 57%), no other source of income (score of 33%) and poor economic status (score of 31%). In Ongpangkong N block, similar to the previous block, majority of the sample households went for collection because of the traditional norms (score of 69%) followed by availability of good source of food (score of 60%), good source of income (score of 57%), no other source of income (score of 32%) and poor economic status (score of 32%).

Table 1: Factors influencing NTFPs income by using multiple linear regression

Sl.No.	Block	Constant	Size of Family	Adult Literacy	Dependency ratio	Income from Agri.	Income from Allied	Income from Wage employment	Employment from NTFPs	R ²	F- value
1	Changtongya	5743.6	-3061.2 (-1.6)	4.4 (0.1)	320.2 (3.2)*	-0.2 (-2.9)	-0.1 (-0.3)	-0.1 (-2.7)	559.7 (16.7)*	0.88	66.43
2	Ongpangkong N	34186.1	2463.1 (1.1)	385.8 (3.5)*	-25.3 (-0.3)	0.1 (0.7)	-0.3 (-0.3)	-0.1 (-2.9)	500.2 (8.3)*	0.88	23.80
	Total	806.7	-1882.1 (-1.2)	42.9 (0.6)	279.3 (3.5)	-0.1 (-2.9)*	-0.1 (-1.2)	-0.1 (-3.1)	554.1 (19.8)*	0.87	90.23

The figure in the parentheses indicates t- value.

*indicates significant at 5%

Table 2: Factors influencing collection of NTFPs from sample households using Garrett ranking

Sl.No.	Factors	Changtongya Block			Ongpangkong N block			Total		
		Percentile position	Garrett's Score	Rank	Percentile position	Garrett's Score	Rank	Percentile Position	Garrett's Score	Rank
1	Poor Economic status	81.6	30.73	5	80.32	31.74	5	81.2	31.04	5
2	Availability of good source of food	36.38	57.03	3	31.94	59.84	2	35	57.9	3
3	Good source of income	30	61.74	2	39.03	56.61	3	32.8	60.15	2
4	Traditional	23.33	66.38	1	19.03	68.55	1	22	67.05	1
5	No other source of income	78.41	33.28	4	76.68	32.26	4	78.8	32.96	4

In totality, the result shows that majority of the sample households went for NTFPs collection because of their traditional norms (score of 67%), followed by good source of income (score of 60%), availability of good source of food (score of 58%), no other source of income (score of 33%) and poor economic status (score of 31%).

Relationship of quantity of NTFP collected with different probable factors

A trial had been made here to identify the factors that affect collection and income of NTFPs. Based on information and experiences availed from various sources, some of the probable factors that affect on NTFPs collection/income identified are family size, literacy level, dependency ratio, gender, village, income from other sources and NTFPs income. Trial had also been made to identify the factors based on types of NTFPs collected

Table 3 shows the relationship of quantity collected with different probable factors. Small family size was seen to collect maximum average quantity of wild fruits and wild vegetables, and medium family size

was seen to collect maximum average quantity of fuel wood, others category and medicinal plants. Households with high literacy was seen to collect maximum average quantity of wild fruits, and households with medium literacy was seen to collect maximum average quantity of wild vegetables, medicinal plants, fuel wood and others category. Households with high dependency ratio used to collect maximum average quantity of wild fruits, wild vegetables and fuel wood, and medium dependency ratio used to collect maximum average quantity of medicinal plants and low dependency ratio was seen to collect average maximum quantity of others category. Based on gender, as male members involvement was more in collection of NTFPs, so in comparison to female, male were seen to collect more of all categories of NTFPs. Households with medium income group were seen to collect maximum quantity of all the types of NTFPs. Households with higher income from NTFPs were seen to collect maximum quantity of wild vegetables, fuel wood and others and medium income group were seen to collect maximum quantity of wild fruits and medicinal plants

Table 3: Relationship of quantity of NTFPs collected with different probable factors

Factors	Average quantity of NTFPs collected annually (kg)				
	Wild fruits	Wild vegetables	Medicinal plants	Fuel wood	Others
1. Family size					
High(>8)	-	-	-	-	-
Medium(4-8)	15.23	76.59	7.95	750	61.55
Small(<4)	23.86	100.76	5.46	678.57	51.79
2. Literacy level					
High Literacy	19.06	80.79	6.92	735.7	54.96
Medium Literacy	12.5	159.16	9.16	750	82.5
Low literacy	12.08	73.33	7.25	541.6	80.16
3. Dependency ratio					
High	22.17	96.64	7.29	71.01	722.9
Medium	12.08	79.03	8.87	54.37	709.67
Low	11.52	69.52	5.19	46.38	736.11
4. Gender					
Female	10.79	26.08	4.2	270	18.15
Male	25.71	144.02	9.96	1180	98.11
5. Income from others sources					
High	17.29	35.29	5.42	375	20.54
Medium	24.29	234.64	11.43	938.57	162.22
Low	17.87	79.49	6.95	759.26	54.70
6. Income from NTFPs					
High income	12.94	161.32	3.8	1058.82	112.67
Medium income	22.17	79.63	8.16	770.16	56.33
Low income	10.95	39.28	6.5	321.42	19.28

4. CONCLUSION

It can be concluded that majority of forest dwellers went for collection of NTFPs mainly because of traditional norms followed by Naga society. At the same time people go for collection of NTFPs because NTFPs are good source of income as well as an integral part of food security. Dependency ratio and employment from NTFPs were found significant and positively related with income from NTFPs. As the number of dependents increased, they went for NTFPs collection since they found it convenient compared to other activities. For every one percent increase in dependency, income from NTFPs increased by Rs.279.33 and for every one-man day increase in employment from NTFPs, NTFPs income increased by Rs. 554.08.

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