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MODELING SOCIO-ECONOMIC CHARACTERISTICS AND INVOLVEMENT IN NON WOOD FOREST PRODUCTS EXPLOITATION IN AJK, PAKISTAN'S

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In Pakistan, the diversity of different Non Wood Forest Products (NWFPs) and their role to cater for different health and income advantages as well as supporting livelihoods of the poor, it's important to explore factors affecting successful exploitation of NWFPs. Present research was carried out to understand the role of socio-economic characteristics of the inhabitants towards involvement in NWFP enterprise in Azad State of Jammu and Kashmir (AJK), Pakistan. A survey was administered on 200 respondents of the two largest and important districts i.e., Muzzafarabad and Bagh. Logistic regression approach was employed to find out the involvement of local community in NWFPs collection, extraction and marketing and it was econometrically modelled as a function of socio-economic characteristics of the respondents. The results revealed the community involvement in NWFP venture being a family enterprise while age, education and income of the respondents were important socio-economic factors influencing NWFPs involvement. The study concluded that NWFPs have great potential to improve socio-economic conditions of devastated areas and there is need to disseminate strategies for judicious exploitation of NWFPs by targeting family unit and socio-economic fabric of the areas.
Keywords: Diversity, livelihood, logistic regression, NWFPs potential, socio-economic factors

INTRODUCTION

NWFPs believed to have a significant part in the family economy of poor as well as rich people (Nguyen, 2006). Various NWFPs including the edibles have a potential to support livelihoods and development in the socio-economic status (Negi *et al*., 2010) and such factors are important in formulating development and conservation strategies (Kar and Jacobson, 2012).Reported sustenance of livelihood of communities might result in collection of wild NTFPs that leads towards direct consumption as well as marketing.

The non wood forest products (NWFPs) entail all tangible products of forest origin, except wood encompassing various products for instance, rattan, resin, essential oil, nuts, latex, spices, seed, fruit, leaves, birds, fish, game, gum, lac and honey (Saha and Sundriyal, 2012). NWFPs in Pakistan are grouped into morels (Iqbal, 1991), honey, wild fruits and nuts (EPB, 2001; Iqbal, 1991), wild vegetables, condiments and spices (Iqbal, 2002; Daud, 1994), silk casings, vegetable tanning and oil, resins, medicinal plants and grasses etc. (Iqbal, 1993).

Researchers found out that various socio-economic factors are important in the extraction, utilization, processing and marketing. Besides physical capital, economic growth is also reflected through human capital, nonetheless, development in the latter would encompass economic and social stability and economic growth. Various human factors such as age, education, social status in addition to land have a positive effect on adoption and continuation of development interventions. Ogundele *et al.* (2012) revealed that age, education, gender and income level significantly influenced utilization of NWFPs. Income from NWFPs might be dependent on various factors such as number of household members and value of household implements and furniture (Kar and Jacobson, 2012). Famuyide *et al.* (2013) analyzed age, education, occupation and income as predictor of effectiveness of NTFPs as medicinal properties perceived by the respondents. Similarly, according to Mutie *et al*. (2006) family participation to extract forest products for income generation mainly depends on size of household and proximity to forest based industries. It was observed by Yemiru *et al*. (2010) that forest products remained important income source and helpful in poverty alleviation amongst the poor, especially during financial crisis.

AJK has a rich diversity of NWFPs, comprising of different ethnic groups with traditional NWFPs-related practices and trade, and accounts for 0.3% of the forestry sector's contribution to the country's economy (Govt. of AJK, 2011). In view of the importance of socio-economic variables in various stages of NWFPs like exploitation, utilization and marketing, present study was designed with the aim to find out the relationship between people's involvement in NWFPs and various socio-economic variables thereby

identifying important factors to target for development interventions.

MATERIALS AND METHODS

The study was conducted in two districts of Azad Jammu and Kashmir (AJK) state that lies between longitude 730–750° and latitude 330–360° and comprises an area of 5134 square miles (13,297 square kilometres). The topography of the area is mainly hilly and mountainous with valleys and stretches of plains. The area is full of natural beauty with thick forest, fast flowing rivers and winding streams.

AJK comprises of eight districts, of which the two largest districts, Muzffarabad and Bagh were selected purposively for the present study, as the villages in these two districts are in close proximity to forests and the villagers predominantly harvest the forest resources for their livelihoods; the villagers collect the NWFPs for subsistence and/or trade.

Quantitative data were collected through structured survey questionnaires in AJK during the period March 2011 to September 2011. To determine the research objectives of the study a quick inspection survey of the study area was done. A total of 200 households were randomly selected from the 12 villages (6 from Muzaffarabad and 6 from Bagh districts) based on an introductory meeting with the village head and villagers. A complete list of households and information about the socioeconomic condition of all the households in the village was obtained from the Union council and researcher's personal observations for crosschecking that list. At the end of the reconnaissance and site selection, the village heads were informed about selection of their villages and their permission sought for data collection. About 8 types of NWFPs were considered initially based on secondary information from Forest Department of AJK (food material, medicinal plants, industrial material, fibers, firewood, mineral, miscellaneous items). However, after discussion with the villagers and market stakeholders, five more types of NWFPs were included that people collected e.g. food material (wild vegetables, honey), medicinal plants and morels.

SPSS 17 was used to analyze data and draw inferences. Chi square method was used to analyze years of involvement in NWFPs collection, whereas, logarithmic regression was used to correlate involvement in NWFPs and socio-economic variables (Richman, 2002)

RESULTS AND DISCUSSION

Table 1 exhibits number of years involved in NWFPs collection which were categorized as less than 5 years, 5-10 years and more than 10 years. Majority of the respondents (82%) were having experience of 5-10 years in collection of NWFPs for various purposes. Both study districts were significantly different with respect to years of involvement (^{2}= 33.230, p< 0.000). Almost all the interviewed respondents in Bagh (B) district were having 5-10 years of experience in NWFPs business whereas 68% of the Muzaffarabad (MA) district respondents were found in the same category (Table 1).

Data presented in Table 2 showed that NWFP collection, processing and storage is a whole family venture in both the districts with statistically significant differences. Regarding collection, maximum number of respondents (59%) reported involvement of male members of the families of MA whereas 51% of the sampled population in B reported involvement of male members in the same activity (^{2}= 24.489, p< 0.000). Processing and storage of NWFPs were, however, was mainly female driven activity. Regarding processing 68% of the respondents in B were certain regarding involvement of females as compared to 65% in MA (^{2}= 41.941, p< 0.000). Similarly, majority of the respondents were of the opinion that there was maximum involvement of female members in storage activity (Table 2). The involvement in NWFPs collection, extraction and marketing was econometrically modelled as a function of

Table 1. Percentage of respondents involved in collection of NWFPs.

Involvement		Percentage of respondents			
Number of years involved in collection	Category	MA	B	Total	Chi-square test
	< 5 years	19	2	21	33.230
	5-10 years	68	97	165	(0.000)**
	> 10 Years	13	01	14	

Table 2. Actors involved in collection, processing and storage of NWFPs.

Activity	Percentage of Respondents						Chi-square test
	MA			B			
	Male	Female	Children	Male	Female	Children	
Collection	59	29	12	51	24	25	24.489 (.000)
Processing	24	65	11	30	68	02	41.941 (.000)
Storage	34	60	06	22	66	12	61.128 (.000)

Table 3. Logit estimates of the coefficients of involvement in NWFP activities.

Variables	B	S.E	Wald	Df	Sig	Exp(B)
Age (1)	-1.643	0.496	6.586	1	0.011	0.326
Edu (1)	-1.471	0.502	8.991	1	0.003	5.458
Income (1)	1.542	0.694	3.982	1	0.038	4.873
-2log likelihood	102.450					
Chi-square (7 df)	45.131					
Significance	0.000					

socio-economic characteristics of the respondents. Involvement in NWFPs activities can be ascertained as dichotomous choice (No = 0; Yes = 1). The statistical transformation of the success probability "p" is given in

Logit (pi) = Log (pi/ 1-pi)

Where pi denotes probability of Yes and (1-pi) as probability of No.

The following empirical model has been derived for the present research

Log (pi/1-pi) = o + 1 Age + 2 Edu +
3 Land Holding + 4 Income + 5 Knowledge

Where Age = Dummy for age (0 = Young, 1 = Medium & Old); Edu = Dummy for education (0 = illiterate, 1 = educated); Land hold = Dummy for farm size (0 = less than 05 acres, 1 = more than 05 acres); Income Dummy variable to represent income obtained from farm (0 = low, 1 = high); Knowledge = Know how about NWFP activities classified on a scale ranging from excellent to poor.

The empirical findings of the model are presented in Table 3 using maximum likelihood assessment procedure based on Chi-square test. The goodness of fit of a logit model can be determined by the probability of the likelihood of involvement in NWFPs which is measured in terms of –2 log likelihood. The –2LL for the model is 102 and model Chi-square is 45.13 which are significant at 0.000 level of significance. Another technique that can find out the logit fit model is the classification. It is estimated to see if predicted values were over 50% cut off indicates involvement/ success and respondent is predicted as positively involved in engaging NWFPs activities. Three out of five variables in the model were found significant. The significant explanatory variables were age, education and income for engagement in NWFPs activities.

Age was found to be negatively correlated but statistically significantly (B = -1.643; Wald = 6.586, $p<0.01$) in involvement in NWFPs activities (Table 2). The negative sign of the age coefficient showed that young respondents were more involved in NWFPs activities. The findings of present research are in line with Emmanuel (2013) while some researchers in Nigeria found out that rural youth were more engaged in NWFPs collection, processing and marketing as compared to old age groups. Similar findings were reported by Richman (2002) wherein age was found to be positively correlated with collection and use of NWFPs. It seemed a good sign and opportunity for rural youth to be engaged in profitable ventures. The odds of education (B= -1.471; Wald= 8.991, $p<0.003$) indicated negative sign which implies that illiterate people were more engaged in NWFPs activities. Similar findings were reported by Opaluwa *et al.* (2011). Respondents with higher education level may engage themselves in jobs and other income generating activities. Respondents income was also significantly related to the said activities (B= 1.542; Wald= 3.982, $p<0.038$). This suggested that respondents having more income were more inclined to be involved in NWFPs activities i.e. extraction, collection, marketing, storage, etc. in order to cope with the high labour cost and high premiums.

***Conclusion*:** The involvement of all members of family especially children and females in collection and utilization of NWFPs indicated that it's a family enterprise having great significance in everyday life of the residents. Keeping in view various human factors like age, sex, education, occupation and income, pragmatic strategies should be devised for reaping maximum returns from the available forest resources.

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