SOCIO-ECONOMIC FACTORS THAT INFLUENCE DEPENDENCE ON NTFPS FOR COMMUNITY LIVELIHOODS BY HARVESTERS OF NTFPS FOR FOOD IN TARABA STATE

Supported by tetfund TERTIARY EDUCATION TRUST FUND

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Received: February 24, 2018 **Accepted:** April 04, 2018

Abstract: Several factors influenced dependence on NTFPs for community livelihoods by harvesters for food. Information on the role of NTFPs that provides forest foods is crucial to their sustainable management; however, this role has not been properly documented in Taraba State. Therefore, Socio-economic factors that influence dependence on NTFPs for community livelihoods by harvesters of NTFPs in Taraba State were investigated. A four-stage sampling procedure was used in the study. A total of 1,450 harvesters of NTFPs were identified in the 45 wards of the 9 LGAs. At 30% sampling intensity, a total of 435 harvesters were randomly selected to generate data for this study. Four hundred and thirty-five semi-structured questionnaires were administered to Harvesters of NTFPs for food and three hundred and ten retrieved. Socio-economic factors that influence dependence on NTFPs by harvesters of NTFPs for food were analyzed using logistic regression at $\alpha_{0.05}$. Harvesters' occupation (6.25), age (9.22), monthly income (2.13), AEZ (1.77), sex (1.65), educational status (1.22) and main forest based activities (1.21) influences their dependence on NTFPs for livelihoods. There is the need to create awareness on the factors that influence the dependence on NTFPs for community livelihoods by harvesters of NTFPs for food in the study area. This will make them to be cautious of their activities, so as to avoid depleting the NTFPs used as food in the study area. There is also the need for the harvesters to form themselves into NTFPs collector's co-operative groups and this groups should register with the State Department of Forestry who should charge them token fees per quantity of NTFPs collected and their harvesting activities should also be supervised.

Keywords: Community livelihoods, forest products, harvesters, socio-economic factors

Introduction

The term "Non-Timber Forest Products (NTFPs)" refers to all biological resources, products and services other than timber that can be harvested from forest ecosystem for subsistence and trade (Shamly *et al*., 2002; Arnold *et al*., 2011; Bahru *et al*., 2012). They include fruits, nuts, spices, oils, vegetables, construction materials, fuel wood, charcoal, medicinal plants, fibers, resins, latex, gums, dyes, wild honey, bush meat, fish, rattans and bamboo. The past twenty years have witnessed a rapid growth of interest in NTFPs. It is believed that, the promotion of sustainable use of NTFPs could lead to a win-win situation for poverty reduction and biodiversity conservation (Neumann and Hirsch, 2000; Marshall *et al.*, 2003; Jimoh *et al.*, 2013).

There is increasing recognition that NTFPs can contribute significantly to the livelihoods of forest-dependent-communities. NTFPs provide food security and nutrition for both human beings and live stocks. It also provides additional income, employment and foreign exchange earnings (FAO, 2008; Arnold *et al*., 2011).

"Community livelihoods" as defined by Loubser (1995) is the totality of the means by which people in a community secure a living, have or acquire in one way or another, the requirements for survival and satisfaction of needs, as defined by the people themselves in aspects of their lives. Community livelihoods are therefore different from job, which is a specific piece of work or activity performed in exchange for payment. While communities work to obtain money, communities engage in a livelihood to support life; as such community livelihoods may or may not involve money. However, there are instances where a job is a means of livelihood. From the forgoing, livelihoods are the activities people undertake to meet basic needs and to generate income. The concept embraces not only the present availability of the means for making a living but also the security against unexpected shocks and crises that threaten livelihoods. Communities in Taraba State depends on NTFPs for livelihoods and these are influenced by certain factors which are not known and documented and hence the need for this study.

Materials and Methods

The study was conducted in Taraba State, North-Eastern Nigeria. It is located between Latitude 6° 30′ & 9° 36′N and Longitude 9° 10′ & 11° 50′E (Fig.1). Taraba State is bounded in the West by Plateau and Benue states and on the East by Cameroon. The State has sixteen Local Government Areas. It is bounded by Bauchi and Gombe States on the Northern part, Plateau and Nassarawa States on the Western part and Adamawa on the Eastern part. Taraba State has a population of 2,300,736 (NPC, 2006).

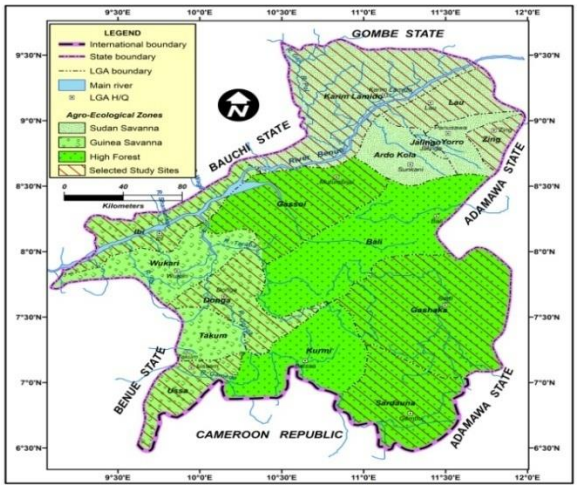

Fig. 1: Map of Taraba State showing the study sites

Sampling procedure and sample size
A total of 1,450 harvesters of NTFPs were identified in the 45 wards of the 9 LGAs. At 30% sampling intensity, a total of 435 harvesters were randomly selected. Four hundred and thirty-five semi-structured questionnaires were administered to generate the data for this study and three hundred and ten retrieved (Diaw *et al.,* 2002).

Table 1: Questionnaire administered and retrieved

Variables	(B)	(N) (30%)	(n)
Harvesters of NTFPs	1,450	435	310
Total	**1,450**	**435**	**310**

Source: Field survey, 2014
B= Baseline; **N=**Total number of questionnaire administered; **n=** Number of questionnaires retrieved

Socio-economic factors such as Age, Sex, Educational status, Monthly expenditure, Agro-ecological zones, Meals per day, Monthly Income, Occupation, Main Forest Based Activity and Household Size of the harvesters were evaluated as indices of the factors that may influence the dependence on NTFPs for community livelihoods by harvesters of NTFPs for food in the study area. Data generated from the study was analyzed using Logistic regression at $\alpha_{0.05}$.
The logistic model of a response P between 0 and 1 is given as:
Logit (P) = Log (P/l-P) = Log (P) – Log (l – P) ----equation 1
The simplest form of logistic model is expressed as:
Logit (Pi) = a + bx_1 ……. equation 2
Pi = probability of dependence on NTFPs for community livelihoods in three Agro-ecological zones of Taraba State; Xi = Vector of predictor or independent variables (socio-economic characteristics of the harvesters of NTFPs for food that can influence their dependence on NTFPs for community livelihoods in Taraba State); a and b = regression parameters

In binary choice models, the two possible results were assigned values of "1" or "0". In this study, harvesters of NTFPs that said "Yes" to dependence on NTFPs for community livelihoods in terms of food were assigned a value "1" and harvester of NTFPs that said "No" to dependence on NTFPs for community livelihoods in terms of food were assigned a value of "0".
The socio-economic characteristics of the harvesters of NTFPs that can influence dependence on NTFPs for community livelihoods in terms of food investigated were; Age, Sex, Educational status, Monthly expenditure, Agro-ecological zones, Meals per day, Monthly. Income occupation, Main Forest based activity and Household size of the respondents respectively.
The binary regression models obtained on dependence on NTFPs for community livelihoods are presented as follows;
Logit

$$\left(\frac{p}{1-p}\right) = Y = \beta_o + \beta_1 X_1 + B_2 X_2 \ldots\ldots\ldots + B_n X_n$$

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Where;
B_0, B_1, B_2 .....B_n = Regression coefficient or model parameters
X_1 = Sex, X2 = Age, X3 =Educational status, X4 = AEZ, X5 = Monthly income, X6 = Monthly expenditure, X7 = Main activity, X8 = Meals per day, X9 = Occupation, X10 = Household size
Y=dependence on NTFPs for food by harvesters of NTFPs (Binary variable)
Logistic Regression Equations ---------- 4

$DONTFPs_{(HVTs)}$ =AGE+SEX+EDS+ME+AEZ+MPD+MI+OCCU+MFBA+HHS
Where;
$DONTFPs_{(HVTs)}$ = Dependence on NTFPs by Harvesters of NTFPs for food; AGE = Age of harvesters of NTFPs for food, SEX = Sex of harvesters of NTFPs for food; EDS = Educational status of harvesters of NTFPs for food, ME = Monthly expenditure of harvesters of NTFPs for food, AEZ = Agro-ecological zone of harvesters of NTFPs for food; MPD = Meals per day of harvesters of NTFPs for food, MI = Monthly income of harvesters of NTFPs for food, OCCU = Occupation of harvesters of NTFPs for food, MFBA = Main Forest Based Activity of the harvesters of NTFPs for food, HHS = Household size of harvesters of NTFPs for food

Result and Discussion
The result of logistic regression on socio-economic characteristics that influenced dependence on NTFPs by Harvesters for food as presented earlier in model 1 (equations 3 and 4) for community livelihoods gave significant fit to the data judging from χ^2 value that was significant at $p<0.05$. Occupation, Age and Monthly income had the highest odds-ratios of 518.35, 9.22 and 8.41 respectively followed by Agro-ecological zone (5.84) and Sex (5.22) while Educational status and Main forest based activity had the lowest odds-ratio of 3.38 and 3.34, respectively. This implied that, Occupation of the harvesters, was the most significant socio-economic characteristic that influenced dependence on NTFPs by the harvesters of NTFPs for community livelihoods in terms of food in Taraba State with odds – ratio 518.35 followed by AGE (9.22), MI (8.41), AEZ (5.84), SEX (5.22), EDS (3.38), MFBA (3.34). The decision rule is that all socio-economic characteristics of the respondents that have odds-ratios with negative values or values lower than two may not influence dependence on NTFPs by the harvesters of NTFPs for community livelihoods in the study area. Only variables with odds-ratios two or greater than two may influence dependence on NTFPs for community livelihoods in the study area.
$DONTFPs_{(HVTS)}$ = 2.099 + 2.22AGE + 1.65SEX + 1.22EDS + 0.68ME + 1.77AEZ – 41.09MD + 2.13MI + 6.25OCCU + 1.21MFBA – 0.711HHS ……equation 5
n = 310, Final Loss = 18.78, Chi-square (df, 10) = 419.48, P = 0.00
Odd ratio (unit change): constant (1.31); AGE (9.22); SEX (5.22); EDS (3.38); ME (1.98);AEZ (5.85); MD (0.00); MI (8.41); OCCU (518.35); MFBA (3.34); HHS (0.49).

The socio-economic characteristics of the Harvesters that influenced their dependence on NTFPs for community livelihoods in Taraba State showed: occupation, Age, Monthly income, Agro-ecological zone, Sex, Educational status and Main forest based activity as socio-economic characteristics that may influence Harvesters dependence on NTFPs for community livelihoods in terms of food in the study area. This is because, the estimated co-efficient for the above mentioned variables were not zero, negative values or less than two but were above two. This implied that, the regression parameters in the model were statistically significant. The higher the value of the odd-ratios of the socio-economic variables of the Harvesters, the higher the likelihood of such variables to influence dependence on NTFPs by the Harvesters of NTFPs for food in the study area. The findings of the study corroborated Deeks 1996: Bland and Altman (2000), that the logistic model provides information on the consequence of one variable on the other. The study is in line with the submissions of Arnold and Perez (1998), Ahenkan and Boon (2008, 2010). The occupation of the

harvesters of NTFPs may likely influence their dependence on NTFPs. This is because occupations such as farming, fishing etc. are faced with shocks compared to occupations such as motorist, driver, okada, riders, Artisans, civil servants etc. Civil servant, Artisans, motorist, okada riders etc. are less likely to depend on the harvesting of NTFPs for livelihood support because they have alternatives that generate daily income to them and this can cushion the effect of any shock that might come their way, compare to the farmer who has only one farming activity. The findings of the study corroborated Deeks (1996), Bland and Altman (2000), that the logistic model provides information on the consequence of one variable on the other. The finding of this study agrees with the findings of Basu (2009; Bahru *et al.*, 2012).

Although, NTFPs benefited all ages of the harvesters. The Age of the harvesters may likely influence Harvesters' dependence on NTFPs because they too young and the too old may not find it easy to enter the forest to harvest NTFPs. They may not have the physical, strength to engage in strenuous activities involved in the harvesting of NTFPs for livelihoods e.g. felling or uprooting a tree for conversion to charcoal or cutting and loading a pick up van with fire wood to be sold in a rural market. Age is also an indication of the active working life of the respondents. Age also dictate access to relevant community networks where information on NTFPs can be accessed. The findings of the study corroborated Deeks (1996), Bland and Altman (2000), that the logistic model provides information on the consequence of one variable on the other.

The monthly income of the harvesters may likely influence their dependence on NTFPs. This is because when there is a shock, the poorer harvesters are worst affected. There is a positive relationship between poverty and reliance on NTFPs. The findings of the study corroborated Deeks (1996), Bland and Altman (2000), that the logistic model provides information on the consequence of one variable on the other.

Table 2: Logistic binary nature of socio-economic characteristics that influenced dependence on NTFPs by Harvesters of NTFPs for food in Taraba State, Nigeria

Dependent variable (HVTs): Dependence on NTFPs for community livelihoods in terms of food (Presence = 1; Absence = 0)

Independent variables	Coefficient	Odds-ratio
Whether AGE influence dependence on NTFPs for food	2.22	9.22*
Whether SEX influence dependence on NTFPs for food	1.65	5.22*
Whether EDS influence dependence on NTFPs for food	1.22	3.38*
Whether ME influence dependence on NTFPs for food	0.68	1.98 ns
Whether AEZ influence dependence on NTFPs for food	1.77	5.85*
Whether MPD influence dependence on NTFPs for food	-41.09	0.00 ns
Whether MI influence dependence on NTFPs for food	2.13	8.41*
Whether OCCU influence dependence on NTFPs for food	6.25	518.35*
Whether MFBA influence dependence on NTFPs for food	1.21	3.34*
Whether HHS influence dependence on NTFPs for food	-0.71	0.49 ns
Model χ^2 (df = 10) = 419.48*		

Note $p<0.05$; ns = Not significant; * = Significant

Similarly, the Agro-ecological zone (AEZ) of the harvesters may likely influence their dependence on NTFPs. This is because NTFPs are location specific. People living near forest are prone to exploitation of the NTFPs than those living further away. The AEZs differ in their composition of NTFPs and so do NTFPs that will be harvested. Some NTFPs are high forest species while some are savannah species. So NTFPs to be harvested by the harvester depends on the location of the harvester and vice versa. The findings of the study corroborated Deeks (1996), Bland and Altman (2000), that the logistic model provides information on the consequence of one variable on the other. Similarly, sex of harvesters may also influence harvester's dependence on NTFPs. This is because the harvesting of some NTFPs are sex specific, may be because of the traditional beliefs and the physical strength involved in the harvesting of such NTFPs e.g. Females are restricted from entering the forest and are also denied access to own land. They merely collect fire wood, vegetables and fruits from nearby farms and wait at home to process NTFPs harvested and brought home by male harvesters. Also strenuous activities such as felling trees or uprooting a tree for charcoal production and lateral roots collection for medicine, palm tapping, hunting etc are exclusively done by male NTFPs harvesters. Perhaps because of the skills and the physical strength involved in the harvesting of such NTFPs in the study area. The findings of the study corroborated Deeks (1996), Bland and Altman (2000), that the logistic model provides information on the consequence of one variable on the other. The finding of this study is similar to the conclusion of Arnold *et al.* (2006, 2011).

Nevertheless, the educational status of the respondents may likely influence the dependence of the harvesters of NTFPs for food. This is in line with Amusa and Jimoh (2012) that, those with lower educational background are mostly involved in the harvesting of NTFPs. This is because those respondents that are not learned are more likely to fall back on the harvesting of NTFP during shocks than those that are learned, because they learned may afford a wider range of income generating opportunities while those that are not Learned, have only one alternative which is farm works. This is because they are largely un-skilled and as such can only limit themselves to farming which is freely accessible and has low technical entry requirement The findings of the study corroborated Deeks (1996), Bland and Altman (2000), that the logistic model provides information on the consequence of one variable on the other. The main forest based activity of the harvester may likely influence their dependence on NTFPs For instance, main based forest activity such as livestock manager, medicinal herbs collector's etc. perform different activities. This agrees with Msuya *et al.* (2010).

Livestock managers will harvest NTFPs for livestock feeds; medicinal herbs collectors will collect leaves, barks, root etc. for medicinal utilization. Similarly fire wood collectors will cut branches of trees for fire wood while charcoal producers will fell an entire tree before converting it into charcoal. This implied that each harvester of NTFPs depends entirely on their main forest based activity. The findings of the study corroborated Deeks (1996), Bland and Altman (2000), that the

logistic model provides information on the consequence of one variable on the other.

Conclusion and Recommendation

Livelihoods are dynamic and can be changed by either internal or external stressors. The strength of a given livelihood is not only measured by its productive outcomes but equally it's resilience to shocks. Livelihoods can only be sustainable if the natural resources are sustained. Based on the above, there is the need to create awareness on the factors that influence the dependence on NTFPs for community livelihoods by harvesters of NTFPs for food in the study area. If the harvesters know the effect of the factors as well as the implication of the factors, they will be cautious of their activities, so as to avoid depleting the NTFPs used as food in the study area. There is also the need for the harvesters to form themselves into NTFPs collector's co-operative groups and this groups should register with the State department of forestry who should charge them token fees per quantity of NTFPs collected and their harvesting activities should also be supervised. This implied that, If one is not a member, he cannot collect or harvest NTFPs and since they are charged token fees per quantity of NTFPs collected, this will spur them not to allow a non- member or a non-contributor to harvest and since they are living together it becomes easier to apprehend intruders and this will cushion over-exploitation since they are under close watch.

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