

Full Length Research Paper

Households' exploitation of non-wood forest products (NWFPs) in Okitipupa Local Government Area of Ondo State, Nigeria

A. S. Oyekale* and D. O. Ajesi

Department of Agricultural Economics, University of Ibadan, Ibadan, Nigeria.

Accepted 17 May, 2011

Exploitation of NWFPs poses serious threat to sustainable forest management in Nigeria. This study analyzed the driving forces for exploiting forest products in Okitipupa Local Government area of Ondo State, Nigeria. Data were obtained through structured questionnaires that were randomly administered to farmers. The data were subjected to descriptive analysis and Tobit regression. Results show that monetary worth of monthly collections of NWFPs is ₦12,167.50 and fuel wood has the highest average monthly collection worth ₦ 3,576.50. The Tobit regression shows that community variable sex, age of house heads number of dependant farming as primary occupation, having alternative means of meeting the needs for NWFPs and dependants income show statistical significance ($p < 0.05$). It was recommended that efforts to reduce degradation of NWFPs must consider development of research into provision of alternatives to some of the resources, reduction in demographic pressure and keen consideration of some cultural gender factors.

Key words: Degradation, forest products, exploitation, Ondo state.

INTRODUCTION

Nigerian forest is renewable natural resource that provides timber for domestic and industrial uses, food for man and wild animals, protective covers for environmental resources such as soil and recreational facilities for tourist attraction (Popoola, 1992; Nathaniel and Adebobola, 2001). Cognizance has been taken of the importance of forest resources to the socio-economic and political development of the Nigerian people (NEST, 1991). Beside timbers, forest contains some other useful products like chewing sticks, wrapping leaves, medicinal plant, camwood, sheabutter, sheanut, gum arabic, Niger Gutta, Bees wax, snail, mushroom, etc. These products are referred to as minor forest products, because of inadequate documentation of their trade in international markets. However, with appropriate market development, foreign exchange can be earned from these minor forest products (Osemeobo and Ujor, 1999). Conceptually, the

definition of NWFP follows the classification given by FAO (1999) where these are referred to as all biological materials (other than wood) which are extracted from natural forests for human use as well as services derived from forests and allied land uses. Osemeobo and Ujor (1999) also submitted that NWFPs are defined as forest materials derived from soil mineral, water, fauna and flora resources other than round wood (sawn wood). The NWFPs are classified into non-wood and non-timber products. The non-wood products are derived from wild animals, herbs, leaves, latex, gum, resins, ropes, fruits, seeds, fungi, fodder, forage, gravel, clay, limestone and natural salt. The woody but non-timber products include poles, fuel-wood, charcoal, rattan canes, sponge, chew sticks, bamboo's and others. These NWFPs make vital contributions to the well-being of the rural poor by providing food materials which are essential dietary supplements during off farm seasons and periods of low agricultural production (NEST, 1991; Arnold and Perez, 2001; Lan et al., 2002).

Availability of NWFPs in any Nigerian ecological zone is a function of the richness of the vegetation, in terms of

*Corresponding author. E-mail: asoyekale@yahoo.com. Tel: +2348029468630.

the structure of species occurring in it and the use of biotic species by the rural population. However, it had been noted that data collection on NWFPs is constrained by many factors. These include information loss, poor storage facilities, inadequate inventory, high rate of poaching, low level forest management and mode of resource harvesting. Despite these set-backs, improvement in data collection can be attained through intensive research, involvement of local communities in

the conservation of NWFPs and partnership in the development of forest resources (Osemeobo and Ujor, 1999). It should be noted that Nigeria natural resources, whether renewable or non-renewable, have suffered significant exploitation by man, particularly since the 20th century due to increase in agricultural land frontier and pressure on vegetation for provision of food and income (Agboola, 1979; FORMECU, 1995). The consumption pattern of NWFPs is highly influenced by socio-cultural and economic factors. Some of the key factors include taboos, social acceptance, level of utilization, demand and tenure issues. In most cases, NWFPs are fully recognized at local level and are harnessed to meet household food security and as dependable sources of income. Also, trade in NWFPs is organized both at the rural and urban areas. However, NWFP respond to market failures because they are not reflected in GDP calculations. Prices of NWFP fluctuate but they are higher during the off season than in the producing season. The middle men fix prices for the goods and sustain the trade both in rural and urban areas (Osemeobo and Ujor, 1999). The sustainable conservation and management of NWFP have been difficult to streamline in Nigerian forestry because over 90% of the NWFP respond to market failures (Osemeobo and Ujor, 1999). The worth of NWFP in Nigeria is difficult to estimate as the prices placed on them are often localized and vary from one area to another. Moreover, the value placed on NWFP is often lower than the cost of replacement (Osemeobo, 1992). Hence, the value of NWFPs is at best social costs; because the markets have failed to reflect the full value of NWFP to under-pricing market prices do not reflect their full marginal opportunity cost to society (Salau, 1991).

By implication because most NWFP are treated as free goods, they are overused, degraded and hence they respond to market failures. The response of agricultural policies to economic reforms and trade policies towards market oriented regimes has increased pressure on the utilization of the Nigerian NWFP (World Bank, 1996). For example while other sub-sector within agriculture are gaining more lands from natural forest. NWFPs are losing the land base and their recognition. Most of the NWFP are treated as intangibles with free access and little restriction (Osemeobo and Ujor, 1999). This paper has the objective of identifying the driving forces for exploiting NWFPs in Okitipupa Local Government area of Ondo State. The first working hypothesis states that with increasing population (proxied by the number of dependants) does not lead to increasing demands for NWFPs. The second hypothesis

states that income from NWFPs does not contribute significantly to household income.

MATERIALS AND METHODS

The study area and sampling procedures

Okitipupa Local Government is one of the local councils in Ondo State. It is bounded in the North by Odigbo Local Government, east by Irele Local Government, south by Ilaje Ese Odo Local Government and west by Ogun State. The forest areas across the Local Government areas are distinctively marked with high density of oil palm trees and timbers. Agriculture is the main occupation of people in the villages. The instrument for data collection is structured questionnaire administered to respondents on a random selection basis. We depended on memory recall since it was impossible for having panel data set. Data were obtained from randomly selected towns and villages like Okitipupa, Ode- Aye, Igbotako, Ilu Tuntun, Idepe, Igodan and Igbodogo. A total of 120 questionnaires were administered with proportionality to the estimated number of farming households. However, 20 were rejected for inconsistent information.

Estimated model

The Tobit model was used to estimate the parameters due to zero values that some of the respondents have on the amount of forest products collected (Gujarati, 1995). The model is as stated:

$$F_i = \alpha_0 + \alpha_i \sum_{i=1}^{13} X_i + v_i$$

Where F_i is the monetary worth of all the NWFPs collected (₦), α 's are the estimated parameters; X_1 is the community dummy (Okitipupa = 1, 0 otherwise); X_2 is the sex of house head (male = 1, 0 otherwise); X_3 is the age of house head; X_4 is the marital status of respondent (single = 1, 0 otherwise); X_5 is the family type (monogamous = 1, 0 otherwise); X_6 is the number of children; X_7 is the number of other dependent relatives; X_8 is the educational status (no formal education = 1, 0 otherwise); X_9 is the primary occupation (farming = 1, 0 otherwise); X_{10} is the have alternatives to forest products dummy (yes = 1, 0 otherwise); X_{11} is the monthly income of respondent (₦); X_{12} is the total monthly income of other working members in the household (₦); X_{13} is the number of land areas cultivated (hectares) and v_i is the stochastic error term.

RESULTS AND DISCUSSION

A descriptive analysis of the socio-economic characteristics of the respondents reveals that 87% of them were males. This shows that most of the households in Okitipupa Local Government Area are still headed by males. Household female headship as revealed in the study resulted from divorce (4%), separation (4%) and state of being single (5%). Average age is 52.79 years with coefficient of deviation of 25.10%. This reveals that majority of the people were already getting old. The oldest was 88 years, while the youngest was 25 years. About 30% of the respondents did not attain any formal education and 73% indicated that farming was their primary occupation. Average number of children of the

Table 1. Average monthly NWFPs collected availability and accessibility in Okitipupa Local Government Area.

NWFPs	Monthly collection (₦)	Coefficient of variation	Availability	Accessibility	Non exploiters (%)
Fuel wood	3576.50	173.29	89.00	85.00	18.00
Bush meat	2505.00	260.76	81.00	71.00	30.00
Chewing stick	724.40	252.67	81.00	76.00	35.00
Fruits and nuts	1101.80	240.92	78.00	72.00	41.00
Gums and resins	313.33	510.33	65.00	62.00	75.00
Herbs and medicinal plants	818.50	174.02	85.00	75.00	32.00
Mushrooms	372.40	211.50	75.00	70.00	54.00
Honey	421.80	234.05	74.00	68.00	64.00
Snail	1259.40	195.30	86.00	74.00	39.00
Leaves and vegetables	738.50	204.10	84.00	75.00	34.00
Poles	339.00	479.40	59.00	38.00	88.00
Total collection	12167.50	154.15	77.91	69.64	17.00

Table 2. A Tobit analysis of the socio-economic determinants of NWFP exploitation in Okitipupa.

Variables	Parameter	T-statistics
Constant	33,431.42***	3.08
Community	-10,029.41**	-2.16
Sex	-11,666.53**	-2.19
Age	-441.56**	-2.13
Marital status	-10,786.65	-1.59
Family type	2,458.03	0.52
Household size	245.68	0.35
Number of dependant	1,670.41**	2.41
No formal education	1,464.16	0.30
Primary occupation	11,949.57**	2.12
Forest alternatives	-9,636.54**	-2.12
Income	-0.12	-0.08
Dependants' average income	0.51**	2.02
Land areas cultivated	299.30	0.56

*** statistically significant at 1% and ** statistically significant at 5%.

respondent is 6.77, with coefficient of variation of 57.11%, while average number of dependent relatives was 2.72 with coefficient of variation of 121.64%. Table 1 shows that for all the NWFPs, the average monetary worth of monthly collections is ₦12, 167.50 with 17% not collecting any. Out of the individual NWFPs, fuel wood has the highest average monthly collection worth ₦ 3,576.50, while gums and resins has the lowest (₦ 313.33). There is wide variation in the amount of NWFPs collected by the people as revealed by the coefficient of variation. This is due to the fact that not all the people really have access to these products. The highest variability is recorded for poles (479.40%), while the lowest is recorded for total NWFPs (154.15%). The NWFP with highest availability as reported by the respondents is fuel wood (89%) while the lowest is poles

(59%). Accessibility is also highest for fuel wood (85%), while pole also has the lowest accessibility of 38%. Out of the individual NWFPs, fuel wood has the lowest percentage non exploiters (18%) and pole has the highest of 88%. Table 2 shows the results of the Tobit regression. It shows that the likelihood ratio chi-square is statistically significant ($p < 0.01$). The community variable is statistically significant ($p < 0.05$). This implies that respondents from Okitipupa gather NWFPs, whose monetary values are lower by ₦10,029.41. This is expected because forests are not readily availability in growing peri-urban center. The sex variable is also statistically significant ($p < 0.05$). This shows that households headed by males gather NWFPs that are lower in monetary values by ₦11, 666.53. This is also expected because fuel wood gathering, which dominates

the NWFPs is culturally reserved for women.

When the households are headed by women due to migration or death of the man, the tendency is that dependency on forest products increases. The parameter for the age of house heads shows statistical significance ($p < 0.05$). This implies that when the age of house heads increases by 1 year, the monetary worth of NWFPs that will be gathered will decline by ₦441.56. This is expected because aged house heads may not have enough strength for gathering forest products that are daily depleted, making them available in farther places. The dependant variable shows statistical significance ($p < 0.05$). This shows that increasing the number of dependants increases the monetary worth of the NWFPs gathered by ₦1, 670.41. The first hypothesis is hereby rejected. Also, the parameter of farming as primary occupation is statistically significant ($p < 0.05$). This shows that involvement in farming as primary occupation increases the monetary worth of NWFPs gathered by ₦11, 949.57. The parameter possession of alternatives to NWFPs shows statistical significance ($p < 0.05$). This implies that those who have alternative means of meeting their needs for NWFPs gather NWFPs that are lower in monetary worth by ₦9, 636.54. While the incomes of house heads do not significantly influence NWFPs exploitation, the dependants' income is positively correlated with the monetary worth of the NWFPs that the households gather. This is expected because in many rural settings, it is the youths that take gathering of forest products as a hobby for personal income. The second hypothesis is also rejected.

CONCLUSIONS AND RECOMMENDATIONS

NWFPs in some Nigerian rural areas suffer significant exploitation, which has resulted into their non-availability as some already go into extinction. This study attempts to evaluate whether households have access to these products and analyze some factors that can promote their utilization. The policy issues derived from the findings of the study are hereby discussed: first, female headship increases exploitation of NWFPs. Policies to reduce degradation of the Nigerian forest resources must take cognizance of the peculiar gender factors associated with dependence on the forest. Occurrences in the nation that increases female household headship will have some detrimental effects on the forest resources in the rural areas. Efforts to address the problem must therefore seek to provide enabling environment where men are willing and able to take responsibility for living with and providing for their homes. Secondly, policies to reduce fertility in the rural areas must be formulated. The study reveals that presence of many dependants necessitates exploitation of NWFPs. This is even corroborated by the positive relationship that exists between the income of the dependants and the worth of the NWFPs gathered.

The government needs to provide appropriate sensitization in the rural areas about the need for having few number of children. However, development of low-cost technology for quicker performance of some farm activities is necessary because some farmers have many children in order to have enough hands to be involved in farming operations. Finally, provision of alternative means of meeting the need for gathering NWFPs will reduce exploitation of forest products. This is necessary because availability of kerosene at affordable price may reduce dependence of people on fuel wood. The government should ensure promotion of research into the alternatives that exist for NWFPs. For instance, provision of rural health center can reduce dependence on herbs and availability of toothpaste can reduce dependence on chewing sticks.

In order to safeguard the future of future generation by avoiding complete exploitation of NWFPs, rural farmers have to be educated on the ways of domesticating some wildlife like grass cutter, rabbits and snails. This is an income-generating venture that has the potential of reducing exploitation pressure on the forest.

REFERENCES

- Agboola SA (1979). *Agricultural atlas of Nigeria*, Oxford University Press, Ibadan, 148 p.
- Arnold JEM, Perez MR (2001). Can non-timber forest products match tropical forest conservation and development objectives? *Ecol. Econ.*, 39: 437-447.
- Food and Agriculture Organization (FAO) (1999). *Non-wood forest products for rural income and sustainable forestry*. FAO Publication Division, Rome.
- FORMECU (1995). *An assessment of land use and vegetation changes in Nigeria 1978 - 1995*. Geomatics, Ontario, Canada.
- Gujarati DN (1995). *Basic Econometrics* McGraw-Hill International Ed. 838p.
- Lan LV, Ziegler S, Grever T (2002). Utilization of forest products and environmental services in Bach Ma National Park, Vietnam Internet file retrieved from http://www.mekong-protected-areas.org/vietnam/docs/bach_ma_forest_products.pdf.
- NEST (Nigeria Environmental Study Action /Team) (1991). *Nigeria's Threatened Environment: A National Profile*. Nigeria: NEST.
- Nathaniel IT, Adebobola N (2001). "The Effects of Poverty in Conservation of Biodiversity: The Nigeria Experience" *Science in Africa Magazine*. Internet file retrieved from www.scienceinAfrica.co.za/2001/nov/nigeria.htm.
- Osemeobo GJ (1992). Land use issues on wild plant conservation in Nigeria, *J. Environ. Manage.*, 36: 17-26
- Osemeobo GJ, Ujor G (1999). *Non-Wood Forest Products in Nigeria*. EC/FAO ACP Data Collection project Technical Report AFDCA/TN/06 FAO: Rome. Internet file retrieved from http://www.fao.org/documents/show_cdr.asp?url_file=/DOCREP/003/X6695E/X6695E06.htm.
- Popoola LA (1992). An invited paper to be presented at the International enabling conference. "The green check initiative" Environmental forum 23-26 April, 2000.
- Salau A (1991). *Ecology and Economics: Economic Strategies for Natural Resources Conservation in Nigeria*, 8p.
- World Bank (1996). *Poverty in the Midst of Plenty: The challenge of growth with inclusion in Nigeria*. A World Bank poverty assessment report, World Bank, Washington, D.C.