International Journal of Climate Change-Action and Environmental Studies (IJCCAS)

International Journal of Climate Change-
Action and Environmental Studies (IJCCAS)
ISSN2245-1800(paper) ISSN 2245-2943(online)
4(8)1-800; January.2026; pp22-26

www.saerem.com

Determinants of Rural Households' Involvements in Non-Timber Forest Products Extractions in the North Central Nigeria.

[1]Akomolafe, S.K, [2]Wole-Alo, F.I. and [3]Alfred S.D.Y

[1,2,3]Department of Agricultural Extension and Communication Technology, Federal University of Technology, Akure; ***Corresponding Author's Email:** akomolafesk@gmail.com

Abstract: The purpose of this study was to ascertain the participation of rural households in the extraction of non-timber forest products in North Central Nigeria (Kogi and Kwara States). Regarding the heads of rural households engaged in the exploitation of non-timber forest products in the research area, two hundred and forty (240) respondents were selected based on Multistage sampling procedure across the three (3) Local Governments areas in each of the two states chosen for the study. Primary data was used in this study. The data collected were analysed with descriptive statistics such as frequency count, percentages and mean. Inferential statistics such as chi-square and pearson product moment correlation (PPMC). The result of the study shows that 59.2% and 58.3% of the respondents both in Kogi and Kwara States were male respectively, 86.7% and 92.5% were married both in Kogi and Kwara States respectively. Respondents both in Kogi and Kwara States were involved in the following NTFPs extraction activities; collection of fuel wood 90.8%, Hunting 89.2%, collection of forage for livestock 61.3%. Among other listed factors, age and primary occupation of the respondents had higher co-efficients among other factors with 0.005*** and 0.027*** respectively.

Keywords: Determinants, Rural households, involvement, Forest products

Background of the Study: Over the past few decades, non-timber forest products (NTFPs), or any product or service other than timber but including wood products, such as those used for fuel or woodcarving, have significantly improved people's quality of life worldwide by providing cash income, food security, health care, nutrition, and other social and cultural ecosystem services.(Shackleton and Shackleton, 2004; CIFOR, 2011; Shackleton *et al.*, 2011; Endamana *et al.*, 2016; Ojea *et al.*, 2016. Furthermore, NTFPs provide the subsistence fuel requirements of people who live in and around forest regions worldwide (Kim *et al.*, 2008; Heubach *et al.*, 2011; Pengelly and Davidson-Hunt, 2012). Furthermore, NTFPs are frequently viewed as a security measure to cover any gaps in the event of an emergency or agricultural shortage (Shackleton and Shackleton, 2004; Dash and Behera, 2013). Investigations According to several research (Angelsen et al., 2014; Steele *et al.*, 2015; Mugido and Shackleton, 2019), the value of NTFPs per hectare may be more than that of timber worldwide; nevertheless, these findings have not gotten the attention they deserve in terms of NTFP management and conservation (Suleiman *et al.*, 2017). Since NTFPs are now widely regarded as a vital tool for sustainable and economic growth, professional attempts to assess their economic potential are being made in a methodical manner (Angelsen et al., 2014; Wunder et al., 2014). Determining the elements that influence the degree of reliance on NTFPs by the local population is necessary to comprehend the socioeconomic impact of NTFPs to rural lives. Understanding the reliance on forest revenue is essential for directing national and local forest use plans. Given this, the study was conducted to examine the factors that influence a household's involvement in NTFP activities. Given this context, the following research topics were addressed in this study: (i) ascertain the socio-economic characteristics of the respondents; (ii) identify the types of NTFP activities engaged in by the respondents; and (iii) examine the factors influencing respondents' involvement in NTFPs activities

Methodology: The study was carried out in Kogi and Kwara States Nigeria. : **Sampling Procedure and Sample Size**: A multistage sampling procedure was used for this study. The first stage involved the random selection of two states from the six states that make up the North central, Kogi, Kwara, Niger, Benin, Nasarawa and Plateau with abundance of forest. Kwara and Kogi were selected. In the second phase, three local government areas (L.G.A.) were chosen at random from each of the chosen states, for a total of six L.G.A.s. Two villages were chosen from each L.G.A. chosen, for a total of twelve villages. Twenty (20) respondents were chosen from each of the twelve villages in the third stage, for a total of 240 respondents for the study.

Instruments of Data Collection: The data for this study was obtained from primary sources which constituted the information that was obtained from the use of questionnaire.

Results and Discussion: Socio-economic Characteristics of Respondents: In this section the socio-economic characteristics respondents were provided. These includes age, sex, marital status, educational level, household size, farming experience, primary occupation, secondary occupation, source of labour and Group membership. As shown in Table 3.1, 40.8%and 45.8% of the respondents in Kogi and Kwara States respectively were between the age of 30-45years, 48.8% and 54.2% respectively were within the age range 46-55years, while 10.4% of the respondents in Kogi State were above 55years of age. The mean age of the respondents in Kogi State was 47.1years, while that of Kwara State was 43.5 years. The implication of this is that the respondents were in their active age. This could be due to the fact that a lot of people of this age group would have taken NTFPs activities as their sources of income while some would have joined them at retirement from service. Moreover, the activities could probably have been influenced by being energetic. The results from this study also imply that most of the respondents were in their active age and so could walk long distances to extract most of NTFPs to secure household food security, primary health care and income. Similar conclusion has been reached by Farinola et al. (2014) the 89% of the respondents were physically and economically active to engage in collection of NTFPs.

The result in Table 3.1 also shows that majority (59.2% and 58.3%) of the respondents in Kogi and Kwara States respectively were male, while 40.8% of the respondents in Kogi and 41.7% of the respondents in Kwara State were female. This result indicated that men were more engaged in extracting products from the forest. Men and women do engage in different NTFPs enterprises based on socio-cultural context and therefore, utilize different resources from the forest. This maybe particularly true in traditional societies where males and females have specific roles and activities (Davenport *et al.,* 2012). For example, the collection of firewood and medicinal plants are jointly carried out in most parts of Africa by both men and women while the collection of honey and gum arabic are exclusively done by men (Agrawal *et al.,* 2013). Out of the sampled respondents, Table 3.1 revealed that 4.1% and 5.0% of the respondents in Kogi and Kwara States respectively were single. Majority (86.7% and 92.5%) respectively were married, 2.5% of the respondents in Kwara State were divorced and 9.2% of the respondents in Kogi State were widowed. The result implies that married people get actively involved in NTFPs gathering possibly because of the need to cater for the basic needs of their family members. The finding of this study is in line with Ibrahim *et al.* (2018) that a high percentage of rural populations are married. They found that married people have the advantage of family labor than the unmarried. As shown in Table 3.1, only 27.5% of the respondents in Kogi State and 10.8% of the respondent in Kwara State had no form of education while the rest of the respondents in both states had one form of education or the other. The level of education attained by the household heads is expected to influence the nature of their economic activities and consequently, the level of their income. This may be because education would make it easier for household heads to comprehend negative externalities and passive user values of natural resources (Newton *et al.,* 2016). It is assumed that the high level of education of respondents would lead to extraction of fewer forest products since education opens up alternative employment opportunities and diverts people from subsistence livelihoods activities such as the gathering of NTFPs from the forest reserve (Newton *et al.,* 2016).

Concerning the household size, 39.2% of Kogi State's respondents and 51.7% of Kwara State's respondents had a household size of 1-5persons while 60.8% of Kogi State's respondents and 48.3% of Kwara State's respondents had a household size of 6-10persons. The mean household size of Kogi State was 5 persons, while that of Kwara State was 6 persons. This implies that majority of those who extract NTFPs have relative large house hold sizes. Large families are more likely to face lower per capita, land availability and high dependency ratios for food requirements (Mujawamariya and Karimov, 2014). They may thus rely on forest resources around them because of the available family labor that can be utilized for NTFPs collection. Experience was measured in years based on the period they have been engaged in the extraction of NTFPs. The table shows that 30.0% of the respondents in Kogi State and 50.8% of the respondents in Kwara State have been on the occupation for 1-15 years, while 56.7% and 30.0% of the respondents in Kogi and Kwara States respectively have been on the occupation for 16-30years. The percentage continues to decrease as the number of years increase, leaving a paltry 13.3% and 19.2% for those who have been on the occupation for 31 years and above in Kogi and Kwara States respectively. The mean years of extraction in Kogi State was 21.8years, while that of Kwara was 19.3years. This means that the respondents had long years of experience on the occupation. Table 3.2 presents the distribution of respondents according to their involvement in various non-timber forest product (NTFP) activities, expressed in frequencies and percentages. The results indicated a high level of participation in most NTFP activities, demonstrating the importance of forest resources to the livelihoods of the respondents. Collection of shea nuts recorded the highest participation rate, with 233 respondents (97.1%) involved. This suggests that shea nut collection is a dominant NTFP activity in the study area, likely due to its high economic value and multiple uses in food processing, cosmetics, and income generation. Similarly, the collection of leaves and vegetables was reported by 96.7% of the respondents while collection of fruits and seeds accounted for 95.8% of the respondents . These findings highlight the critical role of NTFPs in ensuring household food security and dietary diversity. The high participation rates further suggest easy accessibility and regular demand for these products within the community.

Cultivation of food crops within forest environments also recorded substantial involvement, with 93.3% of the respondents engaged in the activity. This reflects the integration of agricultural practices with forest resources,

possibly through agroforestry or forest-edge farming systems. Collection of fuelwood was reported by 90.8% of the respondents, emphasizing continued reliance on forest resources as a primary source of domestic energy. Other activities with high participation include collection of mushrooms (90.0%), medicinal herbs (89.6%), and hunting (89.2%). These activities contribute significantly to household nutrition, traditional healthcare, and protein intake, further underscoring the multifunctional value of NTFPs in rural livelihoods. Moderate levels of involvement were observed in the collection of snails (85.4%), materials for chewing sticks (87.8%), materials for handcraft (81.3%), and collection of locust bean seeds (83.3%). These activities serve as supplementary sources of income and livelihood diversification for the respondents. In contrast, relatively low participation was recorded in tapping of palm wine (22.9%), collection of ropes (28.3%), and materials for matchsticks (37.9%). The low involvement in these activities may be attributed to factors such as limited skill requirements, cultural preferences, seasonal availability, conservation restrictions, or reduced economic incentives. Overall, the findings from Table 4.2 reveal that respondents were involved in a wide range of NTFP activities, with particularly high participation in activities related to food, energy, and income generation. This underscores the significance of non-timber forest products as vital components of rural livelihood systems and highlights the need for sustainable management strategies to ensure the continued availability of these resources.

Factors Influencing Respondents' Involvement in Non-Timber Forest Products Activities :As shown in Table 3.3, the overall model is statistically significant but has modest explanatory power, with an R Square of 0.703, indicating that approximately 70.3% of the variation in NTFP engagement is explained by the included socioeconomic variables. The table show that age has a positive and statistically significant effect on NTFP engagement, as a one-year increase in age is associated with a 0.005 unit increase in engagement, significant at the 1% level. This aligns with Nigus et al. (2024), Ndo et al. (2024), Siltanu, Smith-Hall and Walelign (2024) that older individuals tend to engage more in NTFPs activities due to accumulated knowledge and resource reliance. Primary occupation is also positive and highly significant, with a coefficient of 0.027. This is in line with Nigus, et al., (2024), Toda, Hashiguchi and Hiratsuka (2023) that resource-dependent livelihoods drive NTFP activity as agriculture and off-farm occupations negatively correlated with NTFP income, implying that non-resource-based primary occupations reduce engagement, while forest-reliant ones increase it. Conversely, the source of labour has a negative and significant effect at the 5% level, with a coefficient of -0.038, suggesting that external or hired labor reduces household involvement, finds parallels in studies on labor allocation (Toda, et al., 2023). This corroborates the findings of Lubega et al. (2022) that reliance on household labor enhances engagement, while external sources might divert it. Educational level is positive and significant at the 10% level, with coefficients of 0.013, indicating a positive relationship. This aligns with Asamoah et al. (2024) and Siltanu et al. (2024) that higher education can improve NTFP management or market access. Likewise, Household size's positive association (coefficient: 0.018, $p < 0.10$) is widely corroborated, as larger families provide more labor and have greater subsistence needs according to Nigus et al. (2024), Lubega et al. (2022) and Siltanu et al. (2024). Farming experience is similarly positive and significant, with a coefficient of 0.002. The positive relationship with age and farming experience suggests that older and more experienced individuals are more engaged in NTFP activities, possibly due to accumulated knowledge and reliance on forest resources. The significance of primary occupation underscores that individuals whose main work is resource-dependent are more active in NTFP collection. The negative coefficient for the source of labour implies that improved access to external or hired labour may reduce direct household involvement in NTFP harvesting, possibly reflecting a shift in labour allocation.

Conclusion and Recommendation: According to the study's findings, married and male respondents participated in NTFP activities at higher rates than their female counterparts. According to the study's findings, the participants were more involved in gathering fruits, vegetables, and shea nuts.

References

Agrawal, A; Cashore, B; Hardin, R; Shepherd, G; Benson, C; Miller, D (2013) Economic contributions of forests, Background paper prepared for the United Nations Forum on Forests., http://www.un.org/esa/forests/pdf/session_docum ents/ unff10/EcoContrForests.(retrieved 15 August 2015)

Angelsen, A., Jagger, P., Babigumira, R., (2014. Environmental income and rural livelihoods: a global-comparative analysis. World Dev. 64 (Suppl. 1), S12–S28

Asamoah, O., Danquah, J. A., Bamwesigye, D., Appiah, M., & Pappinen, A. (2024). Factors that Influence Local Perceptions of Climate Change, Product Value Addition, Multiple Uses of NTFPs, and Their Impact on Poverty Alleviation in Ghana. Preprints. https://doi.org/10.20944/preprints202401.0783.v1

CIFOR (Center for International Forestry Research), (2011). Forests and Non-timber Forest Products. CIFOR fact sheets [2021-05-26].

Dash, M., Behera, B. (2013). Biodiversity conservation and local livelihoods: a study on Similipal Biosphere Reserve in India. J. Rural Dev. 32 (4), 409–426

Davenport, N.A; Shackleton, CM; Gambiza, J. (2012). The direct use value of municipal commonage goods and services to urban households in the Eastern Cape, South Africa. Land Use Policy 29(3):548–557

Endamana, D., Angu, K.A., Akwah, G.N., (2016). Contribution of non-timber forest products to cash and non-cash income of remote forest communities in CentralAfrica. Int. For. Rev. 20 (10), 280–295

Farinola, LA., Famuyide, O.O., Nosiru, MO., Ogunsola, A.J. (2014). Survey of Identified Non Timber Forest Products and Their Role in the Rural Livelihood of Inhabitants of Omo Forest Reserve, Ogun State. International Journal of Agriculture and Forestry, 4(4), 317-324.

Heubach, K., Wittig, R., Nuppenau, E.A.. (2011). The economic importance of non-timber forest products (NTFPs) for livelihood maintenance of rural west Africancommunities: a case study from northern Benin. Ecol. Econ. 70 (11), 1991–2001. http://www.cifor.cgiar.org/publications/corporate/factSheet/NTFP.htm

Ibrahim, Y., Aminu, SA., Kumar, H. (2018). Contribution of non-timber forest products to rural household income and livelihood security in Jakusko local government area of Yobe state, Nigeria. Journal of Pharmacognosy and Phytochemistry. 7(6), 509-513.

Kim, S., Sasaki, N., Koike, M., (2008). Assessment of non-timber forest products in Phnom Kok community forest, Cambodia. Asia Eur. J. 6, 345–354

Lubega, G., Falcão, M. P., Ssekandi, J., & Ribeiro, N. S. (2022). Characterizing the dependence on non-timber forest products among communities living around forest conservation areas in Marrupa-Mecula Corridor, Niassa Special Reserve, Niassa Province of Mozambique. *Frontiers in Forests and Global Change*, *5*. https://doi.org/10.3389/ffgc.2022.924959

Mugido, W., Shackleton, C.M. (2019). The contribution of NTFPS to rural livelihoods in different agro-ecological zones of South Africa. For. Pol. Econ. 109, 101983.

Mujawamariya G, Karimov A.A (2014) Importance of socioeconomic factors in the collection of NTFPs: The case of gum arabic in Kenya. Forest Pol Econ 42:24–29

Newton P, Miller DC, Byenkya, M.A.A, Agrawal, A (2016). Who are forest-dependent people? A taxonomy to aid livelihood and land use decision making in forested regions. Land Use Policy 57:388–395

Nigus, A.M., Wassie, A.E. and Abtew, A.A. (2024b) 'Socio-economic contributions and determinants of locals engagement with Boswellia papyrifera in lowland woodlands in Burie Zuria district, Ethiopia,' *Heliyon*, 10(13), p. e33392. https://doi.org/10.1016/j.heliyon.2024.e33392.

Ojea, E., Loureiro, M.L., Allo, M. (2016). Ecosystem services and REDD: estimating the benefits of non-carbon services in worldwide forests. World Dev. 78,246–261.

Shackleton, C., Shackleton, S. (2004). The importance of non-timber forest products in rural livelihood security and as safety nets: a review of evidence from South Africa. South Afr. J. Sci. 100, 658–664.

Siltanu, G.T., Smith-Hall, C. and Walelign, S.Z. (2024) 'What matters? A global meta-analysis of environmental income and reliance determinants,' *Frontiers in Environmental Economics*, 3. https://doi.org/10.3389/frevc.2024.1408794.

Steele, M.Z., Shackleton, C.M., Shaanker, R.U. (2015). The influence of livelihood dependency, local ecological knowledge and market proximity on the ecologicalimpacts of harvesting non-timber forest products. For. Pol. Econ. 50, 285–291

Suleiman, M.S., Wasonga, V.O., Mbau, J.S. (2017). Non-timber forest products and their contribution to households income around Falgore Game Reserve in Kano,Nigeria. Ecol. Process. 6, 23.

Toda, M., Hashiguchi, H. and Hiratsuka, M. (2023). 'Socioeconomic aspects of utilizing non-timber forest products in Myanmar: A review,' *Tropics*, 31(4), pp. 69–79. https://doi.org/10.3759/tropics.sint01.

Wunder, s., Angelsen, a. and Belcher, B. (2014). Forests, Livelihoods, and Conservation: Broadening the empirical base. World Development. http://dx.doi.org/ 10.1016/j.worlddev.2014.03.007

Table 3.1: Socio-economic Characteristics of Respondents

Variable	Kogi State Frequency (%)	Mean	Kwara State Frequency (%)	Mean
Age (Years)				
30-45	98(40.8)	47.1	55 (45.8)	43.5
46-55	117(48.8)		65 (54.2)	
56-65	25(10.4)		-	
Sex				
Male	71 (59.2)		70 (58.3)	
Female	49 (40.8)		50 (41.7)	
Marital Status				
Single	5 (4.1)		6(5.0)	
Married	104 (86.7)		111(92.5)	
Divorced	-		3(2.5)	
Widowed	11 (9.2)		-	
Educational Level				
No formal education	33 (27.5)		13(10.8)	
Attempted primary education	-		7(5.8)	
Completed primary education	21 (17.5)		44(36.7)	
Attempted secondary education	21 (17.5)		3(2.5)	
Completed secondary education	25(20.8)		35(29.2)	
Attempted tertiary education	-		5(4.2)	
Completed tertiary education	16 (16.7)		13(10.8)	
Household Size (Person)				
1-5	47 (39.2)	6	62 (51.7)	5
6-10	73 (60.8)		58 (48.3)	
Years of Extraction				
1-15	36(30.0)	21.8	61(50.8)	19.3
16-30	68(56.7)		36(30.0)	
31-45	16(13.3)		23(19.2)	

Source: Field Survey, 2024

Table 3.2: NTFPs Activities Involved in by the Respondents*

NTFPs Activities	Frequency	Percentage
Collection of Fuelwood	218	90.8
Hunting	214	89.2
Collection of forage for livestock	147	61.3
Collection of mushrooms	216	90.0
Collection of fruits/seeds	230	95.8
Collection of leaves and vegetables	232	96.7

Collection of snails	205	85.4
Collection of medicinal herbs	215	89.6
Materials for handcraft	195	81.3
Materials for chewing sticks	201	87.8
Materials for matches sticks	91	37.9
Cultivation of food crops	224	93.3
Collection of bee honey	145	60.4
Collection of shea nuts	233	97.1
Tapping of palm wine	55	22.9
Collection of ropes	68	28.3
Collection of alligator pepper	107	44.6
Collection of locust beans seeds	200	83.3

Source: Field Survey, 2024.

Table 3.3: Factors Influencing Respondents' Involvement in Non-Timber Forest Products Activities

NTFPs	Coefficients	Standard Error	T Stat	P-value
Intercept	1.397***	0.106	13.237	0.000
Age	0.005***	0.002	2.292	0.023
Marital status	-0.048	0.031	-1.543	0.124
Educational level	0.013*	0.007	1.885	0.061
HHsize	0.018*	0.010	1.817	0.071
Primary occupation	0.027***	0.010	2.613	0.010
Secondary occupation	-0.015	0.010	-1.442	0.151
Farming experience	0.002*	0.001	1.864	0.064
Source of labour	-0.038**	0.017	-2.191	0.029
Group membership	-0.084	0.059	-1.416	0.158

Source: Field Survey, 2024. Multiple R=0.451, R square=0.703, Adjusted R square=0.596, Stndard Error=0.198, Observation-240. Note: ***, **, & * mean significant at 1%, 5% and 10% levels, respectively.