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ASSESSMENT OF TIMBER PLANTATION CONSUMPTION ON LIVELIHOODS AMONG RURAL DWELLERS IN MAGAMA LOCAL GOVERNMENT AREA OF NIGER STATE, NIGERIA

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Abstract

This research was aimed at the assessment of timber plantation consumption on livelihoods among rural dwellers in Magama LGA of Niger State, Nigeria. This study was carried out in four communities of Magama LGA of Niger State, Nigeria which were; Tungan wawa, Kura, Kumbashi and Atabo, as participation communities in timber consumption/utilization activities. Multistage random sampling was used to choose 140 respondents complimented with interview schedule using structured questionnaires. The socio-economic profile of the sampled respondents was determined using descriptive methods. The data obtained from objective I was analyzed using descriptive statistics such as (frequency distribution, percentage mean) objective II was achieved using livelihood status index, , objective III was achieved using Tobit regression while objective IV was achieved using Kendall's coefficient of concordance. The outcome of the research appeared that most of the respondents were active with mean age of approximately 41 years while the average family size was 11. The findings of the study showed that 83.0% were married without formal education almost 64.1% with non-formal education, the research also shows that 92.2% of the rural farmers derived improvement in procurement of food items, following the consumption

Keywords:
Assessment,
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of forest timber resources. Similarly, 86.3% of the rural farmers in the study area had improvement in the expenditure on cultural ceremonies, which was made possible through the consumption of timber plantation resources. Also, bags of charcoal sold had positive and significant effect on their livelihoods implying that increase in the bags of charcoal sold will increase the income and improved the livelihood status of the faming populace in the study area. Similarly, number of timber sold also had positive and significant effect on the livelihoods. The major constraints faced by the respondents were: communal clash, Rapid disappearance of forest resources. It was recommended that due to low educational level of the respondents, efforts should be made by government, non-governmental organisation and other agencies to educate the rural farmers on the benefits of formal education to enable rural farmers utilise forest resources well for their livelihood.

Introduction

Natural forests are among the most important environmental resources worldwide, providing a multitude of ecological, economic, and social benefits (FAO, 2025). In Nigeria, forests and timber resources form the backbone of many rural livelihoods, supplying fuel wood, building materials, furniture, and other wood products that support household needs and income generation (FAO, 2025; Ancha et al., 2025). Timber plantation consumption, specifically, play a crucial role in rural economies by offering both direct and indirect employment opportunities and serving as a buffer against poverty during periods of agricultural shortfalls. The demand for timber and related forest products in Nigeria has continued to rise, driven by population growth, urban expansion, and increasing economic activities. Many rural dwellers depend heavily on timber exploitation not only for household use but also as a principal source of income (Ancha et al., 2025). Fuelwood and charcoal remain the dominant sources of energy for cooking among rural households, with recent estimates indicating that up to 98% of rural Nigerians rely on fuelwood as their primary energy source (FAO, 2025; FAO Forest Report). This high dependency intensifies pressure on forest resources and accelerates the rate of deforestation in many rural areas. While timber utilization contributes significantly to rural livelihood strategies, unsustainable harvesting practices have raised serious environmental concerns. Deforestation and forest degradation resulting from excessive timber extraction have led to loss of biodiversity, soil erosion, reduction in agricultural productivity, and disruption of ecological balance (Innovation Journal of Social Sciences and Economic Review, 2025; FUDMA Journal of Sciences, 2024). Without effective management and sustainable practices, timber exploitation threatens both the

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longevity of forest resources and the well-being of communities that depend on them. Despite the growing body of research on forest resource utilization in Nigeria, much of the literature has concentrated on general forest products or non-timber forest products (NTFPs) rather than the specific impacts of timber forest resource exploitation at the local government level. There is a paucity of localized studies that simultaneously examine the socio-economic benefits and environmental costs of timber use among rural dwellers in specific areas such as Magama Local Government Area of Niger State. This gap underscores the need for focused empirical research that captures the nuances of timber resource utilization within specific rural contexts.

Therefore, this study seeks to investigate the effect of timber plantation consumption on rural dwellers in Magama Local Government Area of Niger State, with particular emphasis on socio-economic contributions, environmental impacts, and the challenges associated with sustainable management. Timber plantation resources provide essential goods and services that support rural livelihoods, particularly in developing countries (FAO, 2025). In Nigeria, forests contribute significantly to rural employment, fuel wood, building materials, and non-timber forest products (Adeniyi & Ngugi, 2018). Magama Local Government Area (LGA) in Niger State is endowed with natural forests and timber resources, which rural dwellers depend on for socio-economic activities. However, the extraction and utilization of timber have both positive and negative effects on rural households' welfare, including income generation, environmental degradation, and food security (Omole et al., 2019).

Aim and Objectives of the study

The aim of this study is assessing the timber plantation consumption on the socio-economic livelihood and environment of rural dwellers in Magama Local Government Area of Niger State. Specific objectives are to:

i. describe socio economic characteristics of the respondents in the study area.
ii. determine the livelihoods status of the respondents in the study area.
iii. determine the timber plantation consumption on livelihood among rural dwellers in the study area.
iv. Identify constraints face by the respondents in the study area.

Study area

This study was conducted in Magama Local Government Area of Niger State, Nigeria. Magama LGA is located in the western with its headquarters in the town of Nasko which is widely recognized as one of the important agricultural zones where forestry and fuelwood collection serves as the primary livelihood activity of the rural population. Magama Local Government Area lies approximately between latitudes 10.4667° N and

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longitudes 5.0500° E. The projected population of Magama LGA was about 181, 653 people as at 2006, with projections indicating steady growth due to natural increase and rural settlement expansion (National Bureau of Statistics, 2025). The majority of the inhabitants are rural farmers who depend largely on small-scale agriculture for income and household food security. The climate of the study area is typical of the Northern Guinea Savannah ecological zone. The area experiences two distinct seasons: the rainy season and the dry season. The rainy season usually begins in April and lasts until October, with annual rainfall ranging between 1,100 mm and 1,500 mm. The dry season extends from November to March and is often characterized by the harmattan wind. Average temperatures range between 25°C and 34°C, creating favorable conditions for crop growth throughout most of the year.

Method of Data Collection

Both primary and secondary sources of data were used for the purpose of this study. Primary data were collected directly from rural dwellers engaged in timber forest resource activities in the selected communities. The primary data was obtained through the use of structured questionnaires complemented with interview schedules. The questionnaire contained both open-ended and close-ended questions designed to capture information relating to respondents' socio-economic characteristics, types of timber forest resources utilized, effects of timber forest resources on livelihood, and constraints associated with timber forest resource exploitation. Secondary data was obtained from relevant documents, government publications, journals, and existing literature related to timber forest resources, rural livelihoods, and forest management in Nigeria. Such sources include reports from the Niger State Ministry of Environment, Forestry Department, and previous academic studies on forest resource utilization.

Method of Data Analysis

Objectives i was achieved using descriptive statistics such as frequency distribution, percentage, counts and mean

Objective ii was achieved using livelihood status index

Objective iii was achieved using Torbit Regression while

Objective iv was achieved using Kendall's Coefficient of Concordance.

Sampling Procedure and Sample Size

Multi-stage sampling procedure was used for the study. The first stage involves the selection of Magama LGA under Agricultural zone III of the state. The second stage involved random selection of four communities under Magama LGA from the State namely: Tungan wawa, Kura, Kumbashi and Atabo. These communities were selected

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based on the availability of timber forest resources and the level of forest-dependent livelihood activities in those locations where rural dwellers have been actively involved in timber forest resource exploitation. The third stage involved obtaining the sampling frame of rural dwellers engaged in timber forest resource activities from community leaders and local forest user groups in the selected communities. From this list, 10 percent of the rural dwellers in each community were randomly selected using simple random sampling technique. This method ensured that each rural dweller has an equal chance of being selected for the study. In all, a total of 140 respondents were selected from the LGA as the sample size for the study.

Table 1: Distribution of Respondents

LGA	Communities	Sampling Frame	Sample Size
Magama	Tungan wawa	352	36
	Kura	387	43
	Kumbashi	291	32
	Atabo	270	29
Total	**4**	**1,300**	**140**

Source: Niger State Ministry of Agriculture and Rural Development (2025)

Socio-economic Characteristics of Respondents

The socio-economic characteristics of the respondents under consideration include age, sex, marital status, household size, level of education and Experience in timber plantation consumption.

Age of the respondents

Result in Table 2 indicates that the mean age of the respondents in the study area was 41 years. The finding suggests that the respondents belong to the middle age classes, who are physically fit to withstand the stress and rigorous activities involved in the exploitation and utilization/consumption of forest resources for their livelihood and are more mentally alert to embrace new techniques that will reduce environmental hazards. This finding agreed with that of Olujide and Oladele (2024) that agro-forestry practitioners in Oyo State were in their active ages of 41 years.

Marital status of the respondents

Finding also shows that 83.0% of the respondents were married which is a strong indication of some kinds of family responsibilities that will compel them to seek for alternative source of livelihood from timber consumption to augment their incomes.

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Sex of Respondents

Result indicates that the majority (73.4%) were male. These findings show that there are higher proportions of male respondents. The male dominance over female in the Timber /consumption utilisation might also be linked to rigorious, tedious and strenous activities involved in the forest resource exploitation and consumption. The finding agrees with that of Owonobi (2024) that male exploit more forest resources in most part of Nigeria than the female because of the strenuous nature of the endeavour.

Household size

Table 2 further shows that the mean household size of respondents was 11 persons. Large household size point to availability of family labour for forest resources exploitation and utilisation. Conversely, large household size could worsen the livelihood situation of rural farmers particularly if they are composed of many dependents. This agreed with Bola *et al.*(2022) who stated that the large household with many dependents could negatively affect the livelihood of rural farmers.

Experience in timber plantation consumption/utilisation

The average years of experience in timber plantation consumption/utilisation in the study area was 20. The fact is that the majority of the respondents in the study area started timber exploitation and utilisation long ago, which signifies that most farmers in the study area earn their livelihood through timber plantation consumption and utilisation. This finding conforms with that of Mbuvi and Boon (2025) who stated that majority of forest users in Makuenni District of Kenya had long year experience in forest resources uutilisation which will go a long way in tackling environmental harzards associated with forest resources utilisation.

Educational level

Table 2 further shows that 64.1% of the respondents in the study area did not have formal education. The implication of this is that those who are literate will be more innovative because of their ability to access information more quickly that will improve their livelihood. In a related study, Ismail (2025) contends that education is an important factor that influence utilisation of forest resources among farmers in Niger State.

Table 2: Distribution of respondents according to socio-economic characteristics

socio-economic characteristics	(n=140) Freq (%)
Age (year)	
≤20	4 (2.6)
21-30	34 (22.2)

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socio-economic characteristics	(n=140) Freq (%)
31-40	35 (22.9)
41-50	55 (35.9)
51-60	21(13.8)
>60	4 (2.6)
Mean	**40.6**
Marital status	
Single	18 (11.8)
Married	127 (83.0)
Widow	6 (3.9)
Separated	2 (1.3)
Sex	
Male	127 (73.4)
Female	64 (41.8)
Household size (number)	
1-5	33 (21.6)
6-10	64 (41.8)
11-15	28 (18.3)
16-20	10 (6.5)
21-25	9 (5.9)
>25	9 (5.9)
Mean	**11.0**
Experience in timber plantation consumption(years)	
1-10	33 (21.6)
11-20	61 (39.9)
21-30	32 (20.9)
31-40	20 (13.1)
>40	7 (4.6)
Mean	**20.2**
Educational level (year)	
No-formal education	98 (64.1)
Primary education	30 (19.6)
Secondary education	13 (8.5)
Tertiary education	6 (3.9)
Adult education	6 (3.9)

Sources: Field survey, 2025

Livelihood status derived from timber plantation consumption/utilisation

Table 3 shows that 92.2% of the rural farmers derived improvement in procurement of food items, following the consumption of forest timber resources. Similarly, 86.3% of the rural farmers in the study area had improvement in the expenditure on cultural ceremonies, which was made possible through the consumption of timber plantation resources. Furthermore, the results revealed that there was improved expenditure on

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non-food items in the study area with 82.4%. These results show that the rural farmers in the study area benefited from the consumpion of forest timber plantation resources in social and economic aspects which will go a long way in increasing their income and improving their livelihood status. In a related study Rhett, (2025) stressed that the wellbeing of rural farmers will improve if there is full access to utilization/consumption of timber plantation resources.

Table 3: Livelihood status of respondents in the study area

Livelihood	(n=140) Frequency (%)
Increase procurement of food items	141 (92.2)
Improved expenditure for non-food item	126 (82.4)
Increase household assets	115 (75.2)
Improve procurement of farm inputs	96 (62.7)
Improved expenditure for non-farm activities	61 (39.9)
Improved expenditure for off -farm activities	71 (46.4)
Increase livestock assets	102 (66.7)
Improve livelihood expenditure	123 (80.4)
Improver expenditure on cultural/ceremonies	132 (86.3)
Improve settlement on hospital bills	126 (82.4)
Ease of sponsoring ward to school	135 (88.2)

Multiple Responses
Sources: Field survey, 2018
Figures in parenthesis are percentages

Effects of timber plantation consumption on livelihood among rural dwellers in the study area

Table 4 shows the effect of forest timber resources consumption/utilisation on the livelihood of rural populace in the study area. In this respect, the results showed Pseudo R^2value of 0.045, implying that about 62.8% of variations that occurs in timber plantation consumption/utilisation on livelihood of respondents were explained by the independent variables included in the model, while the remaining 37.2% were due to external factors not counted for by the researcher. The chi–squared statistic 24.03 was significant at 1% level of probability indicating fitness of the model. Fuelwood had negative significant effect on the livelihood in the study area. This suggests that investment in fuel wood business is not remunerative because of poor market as a result of alternative gas fossil fuel which is more economical.

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However, bags of charcoal sold had positive and significant effect on their livelihoods implying that increase in the bags of charcoal sold will increase the income and improved the livelihood status of the faming populace in the study area. Similarly, number of timber sold also had positive and significant effect on the livelihoods. This is expected because increase in number of bunch of timber sold will increase income of farmers which will consequently improve their. This result suggests that increase in the number of herbs collected from the forest would not improve livelihood status of farmers. This is likely because of the availability of alternative modern orthodox medicines which are more of purity and value of dosage. Moreover, the result reveals that wild fruits had negative and significant influence on livelihoods of the respondents. Thus, increase in wild fruits will reduce livelihood status. This might own to availability of other fruits which may affect their market value and income. This result is in line with the finding of FAO (2025) that timber plantation resources such as mango and orange have direct influence on the livelihood of rural society in Nigeria where most of the rural dwellers depend on the forest resources for their livelihood sustenance.

Table 4: Effect of timber plantation consumption/utilisation on the livelihood of the respondents

Forest resources utilized	Coefficient	P-value
Fuel wood	.0000217	0.26
Bags of charcoal	.0000244	2.03**
Number of timber	.0000339	3.79***
Number of available herbs	.0003002	0.69
Vegetable sold	-2.44e-07	-1.61
Wild fruits	1.27e-06	0.54
Constant	-.0675225	-3.46***
Pseudo R^2	0.045	
Chi^2	17.34	

Sources: Field survey, 2018

*** P ≤ 0.05**

Constraints in forest resources utilisation

In Table 5, the Kendall's coefficient of 0.24 was significant at 1% level of probability, implying rather a weak agreement among farmers regarding what really was their most serious constraints in timber plantation consumption/utilisation. The result shows incessant communal crisis with mean value of 4.99 as the major contraints to timber plantation resources utilisation among rural farmers. This might be due dispute

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overownership of forest by two communities and villages. This finding agreed with the study of Gurung *et al.* (2023) that there were communal clashes in Nepal regards to forest utilisation. This constraint was followed by rapid disappearance of forest resource with mean value of 5.01, this might be attributed to human activities such as deforestation, bush burning and natural phenomena like intense radiation and soil erosion. This result collaborate the finding of Contreras (2024) that human activities lead to forest resources extinction a case of Asha game reserve in Congo where ninety percent of wild animals became extinct from 1999 to 2009. The third ranked constraint was poor price of forest resources with mean value of 5.23 which result from inadequate demand for forest resources. The fourth ranked constraint was forest use restriction by community with mean value of 5.29 because of culture and tradition. Mendoza and Prabhu (2023) reported that fifty-three percent of government owned forest in West Africa were lost to rural farmers due to culture. In a similar study, Charles (2024) submitted that cultural values and norms in the rural societies restrict the utilisation of mushroom forest products in Benue State of Nigeria.

Table 5: Distribution of respondent according constraints face by rural farmer

Constraints	Mean (x) (n=140)	Ranking
Ilegal utilisation of forest resources	8.64	13th
Inadequate labour supply	8.46	11th
Land tenure problem	7.25	6th
Incessant communa crisis	4.99	1st
Fire outbreak	7.91	7th
Poor financial resources	7.92	8th
Poor transportation means	8.46	11th
Forest use restriction by government	5.37	5th
Forest use restriction by community	5.29	4th
Poor credit incentives	8.38	10th
Poor prices of forest resources	5.23	3rd
Use of crude exploitation tools	8.07	9th
Rapid disapperance of forest resources/poor road networks	5.01	2nd
N	326	
Kendall's W	0.24	
Chi-Squared	943.358	
Degree	12	
Asymptotic significant	0.000	

Sources: Field survey, 2025

***Multiple responses**

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Conclusion

The majority of respondents were male in their active productive ages. Also, majority of the rural farmers in the study area were married with long years of experience in timber plantation consumption/utilization and majority of the rural farmers in the study area had no formal education. Shea tree (forest wood resources), vegetables/fruits (forest plant), mammals (forest animal), tree bark/tree, shrub/leaves (forest herbal plants) and skin (forest animal by-products) were the major exploited and utilised forest resources in the study area. Also, vegetables and fruits were the most widely utilised forest plants for livelihood. Truck and Chainsaw were the most working assets acquired by rural farmers in the last season while Car and Generator were the most household assets acquired by respondents in the last farming season. Major constraints faced by rural farmers in the consumption/utiliisation of forest resources were incessant communal crises and rapid disappearance of forest resources.

Recommendations

Based on the findings of this study, the following recommendations were made;

In view of the low educational level of the respondents, efforts should be made by government, non-governmental organisation and other agencies to educate the rural farmers on the benefits of formal education to enable rural farmers utilise forest resources well for their livelihood.

Rapid disappearance of forest resources was one of the major constraint to forest resources utilisation in the study area. Based on this, it is recommended that rural farmers should be trained adequately by extension agents on how to practice sustainable forest strategies such as afforestation and control or restriction of excessive hunting of wildlife in the forest areas in order to conserve forest resources and gurantee their future uses. The sustainable forest practices should pay particular attention to the type of forest resources frequently used and forms of utilization.

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