

EFFECTS OF DEFORESTATION ON THE LIVELIHOOD OF RURAL FARMERS IN MASHEGU LOCAL GOVERNMENT AREA OF NIGER STATE, NIGERIA**¹Mohammed, U., ²Ahmad, B.S., ³Jibrin, S., ¹Umaru, A.**¹Department of Agricultural Economics and Extension Services, Ibrahim Badamasi Babangida University, Lapai.²National Cereals Research Institute Baddegi, Niger State.³ Department of Agricultural Extension and Rural Development, Federal University of Technology, Minna.Email: usmanmohammed.usmanou@gmail.com Tel: 08035146337**Abstract**

The research was aimed at examining the effects of deforestation on livelihood of rural farm households in Mashegu Local Government area of Niger State, Nigeria. Multistage random was used to choose 190 respondents complimented with interview schedule using structured questionnaires. This study was carried out in four communities of Mashegu LGA of Niger State, Nigeria which were; Ibbi, Sabonpegi, Sahorami and Kulho, as participation communities in deforestation activities. The results showed that most of the respondents were active with mean age of approximately 17 years while the average family size was 9 person and 93% were married without formal education almost 76% with non-formal education, the research also shows that the major effect of deforestation on livelihood of rural farming households were: decrease in income, increase in poverty, and increase in vulnerability to climate change and also decrease in agricultural activities. Also reveals that majority of the respondents in the study area lacks knowledge on sustainability of forest resources strategies and practices. The major constraints faced by the respondents were: communal clash, Rapid disappearance of forest resources. It was recommended that outreach of sustainable forest strategies and practice should be advocated and prioritized in the study to avoid further deforestation activities.

Keywords: Effect, Deforestation, Livelihood, Rural populace, Mashegu.**Introduction**

Deforestation means the process of changing forest land from its original state to other permanent forms of non-forested land use such as agriculture, grazing land as well as urban development (Lawal and Bello, 2023). (FAO, 2023) views it as, the irreversible destruction or end of forest cover to make land available for residential, commercial or industrial purposes. (Andrew & Fidelis, 2022), agreed that it is an extensive removal of forest converted to different purposes without replanting them. The earth's surface is covered by forest which provides a lot of environmental benefits such as water cycle, soil conservation, mitigation of climate change and biodiversity preservation. Mahmud (2024) had posited that activities performed in the forest that can enhance rural households' income include the gathering of forest products, processing of the various forest products and marketing of the forest products.

Forest makes provision for a variety of services which are ecological, economic and social, including the conservation of biodiversity, carbon sequestration, soil and water conservation, provision of job opportunities and enhanced livelihood, enhancement of agricultural productivity and improvement of urban and peri urban living conditions (FAO, 2023).

However, this very valuable resource has come under serious threat as a result of deforestation triggered mostly by anthropogenic activities. Adedoyin (2024) reported that about 11 million hectares of forest are being cleared yearly in developing countries, while FAO (2023) estimated that in tropical Africa, the loss of forest cover between the years 2018 and 2022 amounted to about 21 million hectares at the rate of 7% per annum. Also, FAO (2023) reported an estimated loss of forest cover in Nigeria from

17.5 million hectares in 2013 to 13.5 million hectares in 2017, averaging 400 thousand hectares per annum or 2.6%. (Ehis, 2022) had asserted that more than 50% of woodland loss resulting from forest degradation has occurred within the last 4 to 5 decades. Generally, the socioeconomic consequences of forest exploitation and consumption are overlooked. The social effect of forest degradation usually occurs at the local level as evidenced by the loss of ecological services which the forest provides. Therefore, deforestation is viewed as a social injustice symbol (Nathaniel & Solomon, 2023). Despite the rate of deforestation, forests play an important role in moderating both microclimate and local weather in an area. The causes of deforestation differ and can be grouped into natural factors and anthropogenic factors. The anthropogenic factors include degradation of the forest for agricultural activities, fuel wood production, illegal and uncoordinated timber extraction, social and environmental disagreement, industrialization and urbanization (FAO, 2023). The natural factors are mostly drought and natural forest fires (FAO, 2023). In Sub-Saharan Africa including Nigeria, a lot of households depend on the forest for fuel wood which they use for cooking. This is responsible for about 75% of the energy consumed in the country annually as reported by Adamu and Job (2021). Most industries and food processing enterprises run by women depend largely on fuel wood. This dependence on fuel wood has resulted in the increased exploitation of the country's forest. However, forest reserves in forest communities experience more pressure from anthropogenic factors as a lot of the people residing in such communities depend on the access, availability and utilization of forest products for their livelihood (Fidelis 2022)

The essence of forests and forest resources cannot be underestimated because of their vital role in human life. Forests and trees have enormously supported the survival of human life, biodiversity, and ecosystem services. Over the years, forest resources have served as a source of food, medicine, recreation centers, and carbon sinks for billions of the world's populations.

According to United Nations Food and Agricultural Organisation (2024) approximately 1.3 billion people rely on forests and forest products for their livelihoods globally. However, as Jude *et al.* (2021) noted that this number is even higher, with about 1.6 billion people living within 5km of a forest depending on forests and forest products for their livelihoods. This trend indicates a growing global reliance on forests and their resources. Furthermore, forests cover about 31 percent of the world's land surface, storing 296 gigatons of carbon, and are home to most of the world's terrestrial biodiversity. Unfortunately, human and non-human activities have significantly reduced the Earth's Forest cover. The 2022 to 2023 Sustainable Development Report provides evidence that from 2015 to 2024, the Earth's Forest areas decreased by 100 million hectares. (FAO, 2023). The Food and Agriculture Organization (FAO) Forest Resource Assessment survey estimates a net loss of 4.7 million hectares of forests globally yearly since 2010, with deforestation rates considered even higher. Between 2015 and 2020, deforestation was at an alarming rate of 10 million hectares per year, and the area of primary forest worldwide has decreased by over 80 million hectares since 2020 (FAO, 2023).

In Africa, the challenges of bad governance, weak policy implementation, and corruption have led to the rapid exploitation of forests and increased pressure on the remaining tropical forests and arid woodlands (Kabiru, 2023). However, it is crucial to recognize that immediate action is needed. According to the United Nations Environmental Programme, UNEP (2024), and FAO (202), Africa's forests and forest resources are the second most depleted of all the tropical regions globally. Approximately 30 percent of the historical stands remain, but concerted efforts can improve this figure. It has been argued that more than two-thirds of Nigeria's population depend directly and indirectly on forests for survival (Oladele, 2024). According to FAO (2023), about 37,000 km² of forested areas in Nigeria are cleared per annum.

The purpose of the study is to examine the effects of deforestation on livelihood of rural

populace: a case study of Mashegu local government area of Niger State. Nigeria.

Specific objectives are to:

- i. Describe the socioeconomic characteristics of respondents in the study area.
- ii. determine the effects of deforestation on the livelihood of rural populace
- iii. examine the level of practice of sustainable afforestation by the respondents in the study area
- iv. Identify the constraints faced by respondents in the study area.

Methodology

Study Area

Mashegu Local Government Area is located in the Guinea Savannah ecological zone of Niger State. It covers a total land area of 9,182km². About 85% of its land area is good for arable crops production (Niger State Geographical Information System, (NIGIS) 2024). The State lies between Latitudes 5.3940°E and Longitudes 10.2155° N with a population of about 215,002 (NPC, 2006) Eighty-five percent of their populations are farmers. The average annual rainfall is about 1,400mm. The duration of the rainy season is approximately 180days. The wet season usually begins in April/May to October, while the dry season starts from November to March. Most of the communities in the LGA are predominantly agrarian. Tree crops grown are

mango, citrus, coconut, cashew, banana and pawpaw. The Other non-agricultural activities engaged by the people include blacksmithing, leatherwork, mat and basket making and trading. Women on the other hand engaged in technical handicraft and trading.

Material and Methods

Selection of the Study Area and Sample

The research was carried out in four (4) different communities in Mashegu Local Government area of Niger State..

Sampling Procedure and Sample Size

Both descriptive and analytical techniques were used for the study. The communities are: Ibbi, Sahorami, Sabon pegi and Kulho as participation communities in deforestation activities. Multi-stage sampling technique was used for the study. The first stage involved random selection of Agricultural zone III (Mashegu) out of 25 LGS's in the state, this is due to the presence of deforestation activities in Mashegu local government area. The third stage involved random selection of four (4) communities from the Local Government Areas (LGA). At the fourth stage, 15% of the farmers were randomly selected from the sampling frame of each community. In all, a total of 190 respondents were selected from the LGA as the sample size for the study.

Table 1: Sample Distribution of the Respondents in the Study Area

Communities	Sample frame	Sample size (15%)
Ibbi	383	57.4
Sahorami	314	47.1
Sabon pegi	316	47.4
Kulho	254	38.1
Total	1267	190

Sources: Field survey, 2024

Method of Data Collection and Analytical Techniques

Primary data was used for the study, the data were collected by researchers and trained enumerators using structured questionnaire complimented with interview schedule. The data obtained from objective I was analyzed using descriptive statistics such as (frequency

distribution, percentage mean). Objective II was achieved Tobit regression model, Objective III was achieved using Farmers Sustainability index. The index is specified as:

$$\text{FSI} = \frac{\text{Score} - \text{Unadjusted score} - \text{Minimum score}}{\text{Maximum score} - \text{Minimum score}} \times 100$$

≤ 50 = unsustainable%

50 = neutral %

≥ 50 sustainable %

while Objective IV was achieved using Kendall's Coefficient of Concordance.

Kendall's W was computed as shown below.

$$W = \frac{12 \sum R^2 i - 3N(N-1)^2}{N(N-1)}$$

Where:

W = Kendall's value,

N = total sample size,

R = mean of the rank.

Results and Discussions

The socio-economic characteristics of the respondents under consideration include age, sex, marital status, household size, years of farming experience, level of education.

Result in Table 1 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 deforestation 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 Ojo and Olamide (2024) that agro-forestry practitioners in Ogun State were in their active ages of fourth one years.

Finding in the Table 2 shows that 93.0% of the respondents in the study area 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 forest resources deforestation to augment their incomes.

The result in Table 2 indicates that the majority (80%) of the respondents were male while these findings show that there are higher proportions of male respondents in the study. The male dominance over female in the forest deforestation might also be linked to rigorous, tedious and strenuous activities involved in the

forest resource deforestation. The finding agrees with that of Bala *et al.*, (2023) that male exploit more forest resources in most part of Nigeria than the female because of the strenuous nature of the endeavor.

Table2 further shows that the mean household size of respondents in the study area was 9 persons. Large household size point to availability of family labour for forest resources deforestation. Conversely, large household size could worsen the livelihood situation of rural farmers particularly if they are composed of many dependents. This agreed with Bala *etal.* (2023) who stated that the large household with many dependents could force respondents in the study area for deforestation activities.

In Table 2 the average years of experience in forest resources deforestation in the study were between 11 and 20 years respectively, while the mean year of experience for the respondents was 17 years. The fact is that the majority of the respondents in the study area started forest products deforestation long ago, which signifies that most farmers in the study area earn their livelihood through forest resources deforestation. Experience in forest resources deforestation over a long period of time will also go a long way in increasing constraints associated with forest deforestation. This finding conforms with that of Hanifa (2024) who stated that majority of forest deforesters in the western part of Nigeria had long year experience in forest resources deforestation which will go a long way in increasing environmental harzards associated with forest resources deforestation.

Table2 shows that 76% of the respondents in the study area lack 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 on danger of deforestation. In a related study, Kabiru (2023) contends that education is an important factor that influence utilisation of forest resources among farmers in North central Nigeria.

Table 2: Distribution of Respondents According to Socio-economic Characteristics

Socio-economic characteristics of respondents	(n=190) Frequency (%)
Age (year)	
≤20	7 (4.0)
21-30	42 (24.3)
31-40	39 (22.5)
41-50	56 (22.4)
51-60	24 (13.9)
>60	5 (2.9)
Mean	41
Marital status	
Single	16 (6)
Married	126 (93)
Widow	3 (1.0)
Separated	-
Sex	
Male	111 (80)
Female	36 (20)
Household size (number)	
1-5	74 (42.7)
6-10	79 (45.6)
11-15	11 (6.4)
16-20	6 (3.5)
21-25	1 (0.6)
>25	2 (1.2)
Mean	9.0
Experience in resources utilisation(years)	
1-10	54 (31.2)
11-20	57 (32.9)
21-30	46 (26.6)
31-40	11 (6.4)
>40	5 (2.9)
Mean	17
Educational level (year)	
No-formal education	76 (44.1)
Primary education	19 (8.1)
Secondary education	41 (20.6)
Tertiary education	33 (19.1)
Adult education	14 (8.1)

Sources: Field survey, 2024

Effects of forest resources deforestation on livelihood of rural farmers in Mashegu LGA of Niger State, Nigeria

Table 3 shows the effect of forest resources deforestation on the livelihood of rural populace in the study area. Pseudo R^2 of result was 0.628, implying that about 62.8% of variations that occurs in forest resources deforestation on livelihood of respondents were explained by the

independent variables included in the model, while the remaining 33.8% were due to external factors not counted for by the researcher. The chi-squared statistic 22.3 was significant at 1% level of probability indicating fitness of the model. Decreased income had negative and significant effect on the livelihood in the study area. This suggests that investment in deforestation business is not remunerative

because of danger associated with it, both economic, social and environmental hazards.

However, reduced food security has negative and significant effect on the livelihood of rural populace in the study area, implying that increase in the activities of deforestation reduced farming activities they by increased season scarcity, increased poverty will reduce the income and affected the livelihood status of the farming populace in the study area. Similarly, increased vulnerability to climate change has positive and significant effect on the livelihood in the study area. This is expected because

increase in the activities of deforestation will lead to negative climate action. Also, decreased agricultural activities had negative but significant effect on the livelihood in the study area. This result suggests that decreased in the number of agricultural activities due to deforestation activities will result to lower productivity and affect the livelihood of rural populace in the study area. Moreover, the result reveals that Displacement of migration had negative and significant influence on livelihood of farming populace due to the effect of deforestation, movement from rural to urban for competitive resource.

Table 3: Effect of deforestation on the livelihood of the respondents

Effects of deforestation	Coefficient	P-value
Decreased income	-.0001633	-2.31**
Reduced food security	.0000244	2.03**
Increased poverty	.0002365	0.83
Increased vulnerability to climate change	-.0235795	-2.75***
Decreased Agricultural activities	.0001382	0.40
Displacement and Migration	-8.42e-06	-1.40
Constant	.7416063	32.86***
Pseudo R²	0.2188	
Chi²	22.3	

Sources: Field survey, 2024 * P ≤ 0.05

Sustainable Forest Strategies

The result in Table 4 indicates that practice of the following forest strategies: control excessive felling of forest trees (30.0%), carrying out massive afforestation (27.0%), planting two forest tree seedlings to replace one mature tree that is harvested (22.0%), control or restriction of bush burning (21.0%) were sustained. This finding suggests that the practice of sustainable

forest strategies was not practiced in the study area, these might be to the fact that rural farmers in the study area lack adequate knowledge in sustainable forest strategies. This study is line with finding of Umar *et al.* (2024) who reported that inadequate knowledge of sustainable forest practice led to illegal deforestation and destruction of natural resources in the northern part of Nigeria.

Table 4: Distribution of respondents according to practice of sustainable forest strategies

Sustainable forest strategies	FS (%)
Control of excessive felling of forest trees	30.0
Carrying out massive afforestation	27.0
Planting two forest tree seedlings to replace one mature tree that is felled	22.0
Control or restriction of bush burning	21.0

Sources: Field survey, 2024 FSI= Farmers Sustainable Index

Constraints in forest resources utilization

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 forest resources deforestation. The result shows incessant communal crisis with mean value of 4.99 as the major constraints to forest resources deforestation among rural farmers. This might be due to dispute

overownership of forest by two communities and villages. This finding agreed with the study of Ehis (2022) that there were communal clashes in Modakeke in Osun State regards to forest deforestation. 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 collaborates the finding of Adedoyin (2024) that human activities lead to forest resources extinction a case of Bauchi game reserve in Nigeria where ninety percent of wild animals became extinct to date.

Table 5: Distribution of respondents according constraints face by rural populace

Constraints	(n=190)Mean ($\bar{x}$)	Ranking
Inadequate labour supply	8.75	6 th
Land tenure problem	7.47	5 th
Incessant communal crisis	5.33	1 st
Forest use restriction by community	5.07	3 rd
Use of crude exploitation tools	8.36	4 th
Rapid disappearance of forest resources	4.88	2 nd
N	190	
Kendall's W	0.28	
Chi-Squared	570.779	
Degree	12	
Asymptotic significant	0.000	

Sources: Field survey, 2024 *Multiple responses

Conclusion and Recommendations

Based on the findings of these research it can be concluded that majority of the respondents were in their active age and are married. The literacy level is low in the study area with about 76% with no formal education which may affect their level of assessing formal information on the negative effects of deforestation. Moreover, majority of the respondents had large household size. Further findings revealed that majority of the respondents lack formal knowledge on the

sustainable forest strategies to mitigate against deforestation activities. The findings furthered showed that decreased income, reduced food security, increased poverty and increased vulnerability to climate change are major effects of deforestation on livelihoods of farming populace in the study area. It was recommended that outreach of sustainable forest strategies and practice should be advocated and prioritized in the study to avoid further deforestation activities.

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