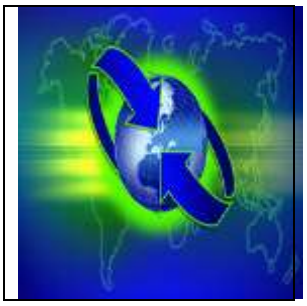

Influence of Income Level and Family Size on Forest Resource Conservation in Akamkpa Local Government Area of Cross River State, Nigeria

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Abstract

This study investigated the influence of income level and family size on forest resource conservation in Akamkpa Local Government Area of Cross River State, Nigeria. A survey research design was adopted for the study. A sample of 215 respondents was selected using purposive and accidental sampling techniques. Data were collected using a structured questionnaire titled *Income Level, Family Size and Forest Conservation Questionnaire (ILFSFCQ)*, with reliability coefficients ranging from 0.76 to 0.81. The data were analyzed using One Way Analysis of Variance (ANOVA) at a 0.05 level of significance. The findings revealed that income level significantly influences forest resource conservation in the study area ($F = 12.117$, $p < 0.05$). Households with lower income levels were more dependent on forest resources for survival, thereby increasing pressure on forest ecosystems. Similarly, family size was found to have a significant influence on forest conservation practices ($F = 10.077$, $p < 0.05$), as larger households required more resources for subsistence and income generation. The study concluded that socio-economic factors play a critical role in shaping conservation behavior among rural dwellers. It therefore emphasized the need for integrated livelihood and population management strategies to promote sustainable forest resource conservation in Akamkpa Local Government Area.

Keywords: income levels, family size, socio-economic factors and forest conservation.

Introduction

Forest resources play a critical role in sustaining livelihoods, biodiversity conservation, and climate regulation, particularly in developing countries such as Nigeria. Globally, forests cover approximately 30% of the Earth's land surface and provide essential ecosystem services including carbon sequestration, soil protection, and water regulation (Food and Agriculture Organization (FAO), 2020). In Nigeria, forest ecosystems are increasingly threatened by deforestation resulting from population growth, agricultural expansion, and unsustainable resource extraction. Studies have shown that forest degradation in tropical regions is largely

driven by human socio-economic activities, making the understanding of household-level determinants essential for effective conservation planning (Amuyou et al., 2021).

Forest to the rural people in Akamkpa Local Government Area of Cross River State is a pivot around which the economic and social wellbeing of the people revolves. Indeed, forest is the mainstay of the people's overall wellbeing. Rural dwellers in forest zone communities of Cross River State see forest as a place where lots of things are gathered for food and daily income. This includes bush mango, mushroom, palm kernel and monkey kola. Timber and other non-timber forest products for yam cultivation, medicinal herbs for infertility and childbirth are obtained from the forest. The importance of forest resources as natural resources capital for economic development, human welfare, and ecosystem sustainability cannot be overemphasized and the declining rate of forest resources in the past decades has raised serious concerns to international organizations, national organizations and nongovernmental organizations (NGOs). Preservation of forest resources is one of the most difficult assignments of scholars, social researchers, natural resources conservators and managers.

In Cross River State, which contains nearly half of Nigeria's remaining tropical rainforest; forest conservation has become a major policy priority due to the region's ecological significance. The state hosts globally important biodiversity hotspots such as the Oban and Okwangwo forest reserves, which support endangered species and diverse plant communities (Amuyou et al., 2021). However, despite conservation initiatives such as the REDD+ programme, forest loss continues to occur due to persistent socio-economic pressures. These pressures are often linked to household characteristics such as income level, employment opportunities, and population dynamics, all of which influence patterns of forest resource use and conservation behavior.

Forest and its resources therein are natural endowments which are of high value to both the environment and man. Amongst all forest types, the one situated within the tropics, generally known as tropical rainforest is the most endowed. Outside the common environmental and

ecological forest functions (climate mitigation, source of natural oxygen, air and water purification, soil and water conservation, flood regulation, natural habitat provision for fauna and flora species, etc), it houses a little more than 50% of all the world's biodiversity; it houses about 67% of the world's fauna and flora species; it stores about 50% of the world's terrestrial carbon (Galbreath & Adjusts, 2019). There are many factors which are connected with rural dwellers resource conservation practices in Akamkpa Local Government Area of Cross River State. It is presumed that income level and family size among others are the factors which can influence resource conservation practices in the forest.

Income level is widely recognized as a key determinant of environmental behavior and natural resource management. Households with higher income levels often possess greater capacity to adopt sustainable practices and invest in alternative livelihoods, thereby reducing reliance on forest resources. Conversely, low-income households tend to depend heavily on forest products for subsistence and income generation, leading to higher rates of resource exploitation. Empirical evidence from forest communities in Cross River State indicates that household income significantly influences participation in conservation initiatives, including REDD+ programmes and community forest management activities (Adedigba, et al. 2024; Amuyou et al., 2021).

Income level is a variable that refers to the stipulated amount of money which is accruable to an individual in a given period of time. It is considered as one of the rural dwellers' demographic variables which determine the exploitation rate of forest resources that may possibly result to forest depletion. Poverty which is as a result of low income assumes a significant part in timberland asset exhaustion. A considerable lot of the world's tropical jungles are tracked down in the least fortunate regions in the world. Country tenants in Cross Stream State who live in and around the tropical jungle depend on these assets for survival. They gather leafy foods, chase untamed life to put meat on the table and are paid by organizations that remove assets from the backwoods lands. Most low-pay individuals never

have the choices that big league salary individuals underestimate. Low pay individuals never have a decision to set off for college, to be an assembly line laborer, or a secretary (Szell, 2012; Lepetu & Garekae, 2015).

While very few have shown it to be an insignificant factor concerning peoples' forest resource conservation practices (Abdullahi, 2017). Galbreath and Adjusts (2019) pointed that the financial status of individuals can be ordered into three specifically: high, medium and low. Those individuals with high 'financial status in the general public don't affect extraordinary tension on forest asset as they can manage the cost of different method for occupation as opposed to depending, entirely on forest assets, despite the fact that there are a few high financial people who utilize their abundance to affect adversely on forest assets. They clear or cut down huge areas of forest for motorized horticulture and businesses in this manner causing the deficiency of the forest and its assets. The medium financial individuals in the general public are consistently between the high and the low financial status. At last, those with low financial status in the general public effect adversely on forest assets. They rely totally upon forest assets for their occupation. These gathering don't have the inclination to embrace forest protection measures as they consider it to be exercise in futility. All they consider is to make money through the forest.

Recent studies have also emphasized the role of income diversification in enhancing forest conservation outcomes. For example, research on smallholder farmers in Nigeria found that improved household income through cooperative participation increased the adoption of climate adaptation and resource management strategies (Ikuemonisan & Ajibefun, 2021). Higher income levels were associated with reduced dependence on forest-based livelihoods and greater investment in sustainable agricultural practices. This finding suggests that economic empowerment can play a significant role in promoting conservation behavior and reducing pressure on forest ecosystems.

In addition to income level, family size has been identified as an important socio-demographic factor influencing forest resource use. Larger households typically require more food, fuelwood, and land for farming, which increases demand for forest resources. Population growth within rural communities has been linked to increased deforestation rates due to expansion of agricultural land and settlement areas. In many forest-dependent communities in Nigeria, large family sizes contribute to increased harvesting of timber and non-timber forest products for household consumption and income generation (Fatoki, et al.2021; Amujiri et al., 2025).

Family size also affects labor availability for resource extraction activities. Households with more members often have greater labor capacity for farming, hunting, and logging activities, which can accelerate forest depletion if not properly managed. However, some studies suggest that larger families may also contribute positively to conservation efforts by providing labor for forest protection activities such as tree planting and community monitoring. These mixed findings highlight the complex relationship between household size and forest conservation, suggesting the need for context-specific analysis in rural communities (Olawuyi, et al. 2020; Amujiri et al., 2025).

Socioeconomic factors such as education, gender, and household income have been shown to significantly influence awareness and participation in forest conservation programmes. For instance, research conducted in forest-dependent communities in Cross River State found that income, education, and household size collectively explained variations in community awareness of conservation initiatives. Among these factors, income was identified as the most significant predictor of participation in forest protection activities (Olawuyi, et al. 2020; Amuyou et al., 2021).

Family size according to Adedigba, Oyetayo, Olaitan and Olukemi (2024) refers to the number of people in a family. Population pressure on forest resources is increasing on daily basis. This is seen as the populace develops, it presses the accessible timberland assets for food

and endurance. Family size is a vital instrument for rural exercises and other pay enhancing exercises of timberland assets double-dealing and use, for example, logging, hunting, fishing, snail picking, extraction of fuel wood, leaves assortment, and so on. This depends on the way that enormous family size generally supplies overflow workforce to ranches as well as give an adequate number of working hands to complete other pay differentiating exercises. Large scale forest resource depletion occurs in Cross River State as a result of ignorance of intrinsic value of the forest, poverty, agricultural practices as well as increase in family size. However, it is fair to say that the higher the family size, the higher the level of forest resources exploitation and depletion (Acheampong, 2024).

Family size as a variable plays a key role in forest resource depletion. The more the number of people in a family, the more the demand for forest resources, and the more the consumption of forest resources and consequently the higher the rate of forest resources depletion. Family size refers to the number of individuals living within a household unit who share resources and livelihood strategies. Collier and Leke (2014) stated that in forest-dependent communities, household size often determines labour availability, consumption needs, and pressure on natural resources. Larger households tend to have more dependents and higher consumption demands, thereby influencing how forest resources are exploited or conserved. Anijah-Obi (2001) in Igwebuike and Etan (2018) indicated that family size significantly affects the level of dependence on forest resources. Larger households are more likely to rely on forests for fuelwood, food, medicinal plants, and income due to increased consumption needs.

Family size has been widely acknowledged in environmental and rural development literature as a key socio-economic determinant influencing forest resource utilization and conservation outcomes. In forest-dependent regions such as Akamkpa Local Government Area of Cross River State, household size plays a significant role in shaping both the rate of forest exploitation and the adoption of conservation practices. Abdullahi, (2017) opined that increasing household size is directly associated with greater pressure on forest resources. Larger

households typically require more food, fuelwood, and land for subsistence, which often leads to intensified deforestation activities. In Nigeria, forest resources are central to rural livelihoods, yet population growth and household expansion have contributed significantly to forest degradation. Studies have shown that increasing population variables, including household size, exert considerable pressure on forest ecosystems, resulting in biodiversity loss and habitat destruction Ajake & Enang, 2017).

Similarly, Fatoki, Thompson, Ojo, Oyerinde, & Olarewaju (2021) reported that Nigeria has experienced one of the highest deforestation rates globally, largely driven by anthropogenic activities linked to population expansion and livelihood demands. Household size also influences patterns of forest dependence and resource extraction. Research conducted in forest communities in Southwestern Nigeria revealed that households with larger sizes tend to depend more on forest resources for firewood, medicinal plants, and agricultural expansion. This dependency is particularly evident in rural settings where alternative sources of income and energy are limited. In Akamkpa, where communities rely heavily on forest products, large family sizes may intensify the exploitation of timber and non-timber forest products, thereby undermining conservation efforts. Olawuyi, Odeyale & Agboola (2020) opined that family size interacts with other socio-economic variables such as income, education, and access to resources to determine conservation outcomes. In many cases, the negative impact of large household size on forest conservation is exacerbated by poverty and low levels of environmental awareness (World Bank, 2020).

Community participation is widely recognized as a critical component of sustainable forest management. Conservation programmes that fail to address the socio-economic needs of local communities often encounter resistance or non-compliance. Studies on forest governance in Nigeria have shown that exclusion of local communities from decision-making processes can lead to increased illegal logging and unsustainable resource use. In Cross River State, lack of

community engagement has been identified as a major challenge to the success of forest conservation policies (Asiyanbi et al., 2020).

The relationship between poverty and environmental degradation has been widely discussed in environmental literature. The poverty- environment trap theory suggests that low-income households exploit natural resources unsustainably due to limited economic alternatives. In rural Nigeria, dependence on forest resources for fuelwood, food, fodder and income is particularly high among poor households, making poverty reduction a key strategy for promoting conservation (Amuyou et al., 2021).

Furthermore, climate change has intensified pressure on forest ecosystems by altering rainfall patterns, increasing temperatures, and reducing agricultural productivity. These environmental changes have forced many rural households to rely more heavily on forest resources for survival. Studies have shown that climate variability increases household vulnerability and encourages unsustainable harvesting of forest products, particularly among large families with limited income sources (Amuyou et al., 2022). Government policies and institutional frameworks also play a significant role in shaping forest conservation outcomes. In Nigeria, forest management policies such as logging bans and protected area regulations have been implemented to reduce deforestation. However, enforcement challenges and limited community participation have reduced the effectiveness of these policies. Research indicates that policies that provide financial incentives and livelihood support to local communities are more successful in promoting sustainable forest management (Amuyou et al., 2021; Nuesiri, et al. 2020).

Recent studies have increasingly focused on the role of socio-economic variables in forest conservation, but many have examined these factors independently rather than in combination. For example, some studies analyze the impact of income on conservation behavior, while others focus on population growth or household size. Few studies have simultaneously examined the combined influence of income level and family size on forest resource conservation, particularly

at the local government level. This limitation reduces the ability of policymakers to design targeted interventions that address multiple socio-economic drivers of deforestation.

Another limitation in existing literature is the lack of location-specific studies focusing on Akamkpa Local Government Area. Although several studies have been conducted in Cross River State, most have focused on broader regions or specific conservation programmes such as REDD+. These studies often overlook community-level variations in socio-economic conditions and resource use patterns. Given that Akamkpa is a major forest-dependent area with significant biodiversity resources, there is a need for localized research that reflects the unique socio-economic characteristics of the community.

Moreover, previous studies have relied heavily on cross-sectional survey designs, which provide limited insight into long-term changes in household behavior and forest conservation outcomes. Longitudinal studies that track changes in income level, family size, and conservation practices over time are relatively scarce in Nigeria. Such studies are essential for understanding the dynamic relationship between socio-economic factors and environmental sustainability, particularly in the context of climate change and rural development.

Finally, there is limited empirical research examining the interaction between demographic factors and conservation attitudes among rural households in Nigeria. Most existing studies focus on economic indicators such as income and employment without considering social factors such as family structure, cultural practices, and household decision-making processes. Addressing this gap is critical for developing holistic conservation strategies that integrate socio-economic development with environmental protection.

In Akamkpa Local Government Area of Cross River State, the persistent loss of forest resources now constitutes a serious threat to the survival of the local population. A large proportion of the virgin forest has been encroached into, and the people are rapidly losing their old growth forest, which is their source of livelihood. Issues of forest clearings for large scale mono-crop agricultural land uses coupled with slash and burn practices decimate the forest

immensely from an agro-based perspective. From the commercial dimension, logging and fuel wood extraction have also contributed a very significant quota towards the fast rate at which the forest is disappearing. Other rural dwellers activities, with significant impacts on the forest and its resources, are aspects of unsustainable harvesting of non-timber forest products, unauthorized poaching and usage of chemicals/poisons for hunting and fishing. These rural dwellers activities have contributed significantly to the endangerment and extinction of most common fauna and flora species in study area.

In spite of the massive and uncountable benefits of the forests, the resources are under threat of mass elimination of species and genetic resources through the impact of human activities, hence, rendering government's huge effort toward conservation abortive. The question making round is: what then would be responsible for the existence of these activities in Akamkpa Local Government Area of Cross River State? This question has given rise to series of arguments and debates. Many scholars often blame it on inability of state governments to enforce conservation bills and laws, and institutional failures. Others blame it on poor awareness, socioeconomic factors such as illiteracy, poverty, as well as individual thoughts and behaviour which reflects their attitude and emotion towards forest conservation. The problem of this study therefore is to empirically investigate whether rural dwellers demographic variables influence forest conservation of resource. It is based on this problem that the researchers sought to ascertain the influence of income level and family size on forest resource conservation within Akamkpa Local Government Area of Cross River State.

Research Objectives

The purpose of this study is to ascertain the influences of income level and family size on forest resource conservation in Akamkpa local government area of cross River state, Nigeria. Specifically, the study sought to.

1. Assess the extent to which income level influence conservation of forest resources in Akamkpa local government area of cross River state.

2. Investigate the extent to which family size influences conservation of forest resource practices in Akamkpa local government area of cross River state.

Research Questions

1. How does income level influence conservation of forest resources in Akamkpa local government area of cross River state?
2. To what extent does family size influences conservation of forest resource practices in Akamkpa local government area of cross River state?

Research Hypotheses

1. There is no significant influence of income level on conservation of forest resource conservation in Akamkpa local government area of cross River state
2. There is no significant influence of family size on conservation of forest resource conservation in Akamkpa local government area of cross River state

Research design and methods

A survey design was adopted for the study. Stage-wise and purposive sampling and accidental technique were employed for the study. It is a sampling technique whose procedures permit a researcher the opportunity to apply his judgment to exclusively include elements characterized as being typical of the population in his sample based on criteria such as accessibility and ease of data collection. At the first instance, the technique was employed to purposively select a forested community within Akamka local government area. This was followed by accidental sampling of respondents who were found during the administration of the instruments for data collection within the selected communities.

A sample of 215 respondents was drawn using purposive sampling technique. A 20-item questionnaire titled “Income Level, Family Size and Forest Conservation Questionnaire” (ILFSFCQ) was used for data collection in the study. Cronbach Alpha was used to estimate the reliability of the instrument, which ranged between .76-.81. The two null hypotheses formulated

for the study were analyzed using One Way Analysis of Variance (ANOVA) and tested at 0.5 significant levels.

Results and discussions

Hypothesis 1

There is no significant influence of income level on the conservation of forest resource in Akamkpa local government area of Cross River State The result of data analysis is presented in Table 1

One Way Analysis of Variance (ANOVA) result analysis shown on Table 1 indicated that the F- calculated value of 12.117 (F=12.117, p<.05), is greater than critical F-value of 3.96 analysed at .05 alpha and 2 and 214 df and hence p<..000) were smaller than p(.05), it means income indeed significantly influences forest resource conservation in the study area. Therefore, the null hypothesis was rejected. .

Table 1: One Way Analysis of Variance (ANOVA) result on influence of income level on conservation of forest resource conservation in Akamkpa local government area of cross River state (N=215)

Variable	N	$\bar{X}$	S.D
Below N10,000	62	30.4510	3.11143
N11,000- N20,000	92	28.9481	3.69885
Above N20,000	61	28.7177	3.24935
Total	215	28.9692	

Source of variation	SS	DF	MS	F-ratio	p-value
Between Groups	126.202	2	85.311	12.117	.000
Within Groups	4202.248	212	11.533		
Total	4328.450	214			

*Significant at .05 level, F-crit.=3.96

Hypothesis 2

There is no significant influence of family size on conservation of forest resource conservation in Akamkpa local government area of Cross River State The result of data analysis is presented in Table 2.

One Way Analysis of Variance (ANOVA) result analysis shown on Table 2 indicated that the F-calculated value of 10.077 (F=10.077, p<.05), is greater than critical F-value of 3.96 analysed at .05 alpha and 2 and 214 df and hence p<.000) were smaller than p(.05), it means family size significantly influences forest resource conservation in the study area. Therefore, the null hypothesis was rejected.

Table 2: One Way Analysis of Variance (ANOVA) result on influence of family size on conservation of forest resource conservation in Akamkpa local government area of cross River state (N=215).

Variable	N	$\bar{x}$	S.D
1-3 MEMBERS	64	25.1822	3.22165
4-5 MEMBERS	90	26.0113	3.51121
Above 6 MEMBERS	61	25.1136	3.44122
Total	215	25.7713	3.11331

Source of variation	SS	DF	MS	F-ratio	p-value
Between Groups	122.113	2	92.186	10.077	.000
Within Groups	4206.317	506	11.332		
Total	4328.450	508			

*Significant at .05 level, F-crit.=3.96

Discussion of findings

From the one way analysis of variance testing hypothesis one on table 1, the result showed that there is a significant influence of income level on the conservation of forest resource in

Akamkpa local government area of Cross River State The finding is in line with those of Acheampong (2024) and Amuyou et al., (2021), who found that household income levels significantly influence conservation behaviors and attitude indicating that with lower-income households prioritizing immediate livelihood needs over long-term forest sustainability. However, the study also observed that when provided with alternative income opportunities, households reduced their reliance on forest extraction. Similarly, Michael (2020) and Galbreath and Adjusts, (2019), using household survey data from Malawi, established that low-income households extract a higher proportion of forest products relative to their total income than wealthier households.

This result is a further confirmation of the earlier finding of Szell, (2012); Lepetu and Garekae, (2015) and Abdullahi, (2017) whse respective results found that households with higher income levels often possess greater capacity to adopt sustainable practices and invest in alternative livelihoods, thereby reducing reliance on forest resources. Conversely, low-income households tend to depend heavily on forest products for subsistence and income generation, leading to higher rates of resource exploitation. The study further showed that forest resources serve as a safety net during economic shocks, reinforcing extraction patterns among the poor.

The result of the one analysis of variance on table two shows that there is a significant influence of family size on conservation of forest resource conservation in Akamkpa local government area of Cross River State The result finding is in line with the study of Olawuyi, Odeyale and Agboola (2020) and Ikuemonisan and Ajibefun, (2021) who found that household size significantly influence participation in forest management practices, with larger households more likely to engage in labor-intensive conservation activities such as tree planting and selective weeding. This implies that when properly mobilized, large families can serve as important human resources for sustainable forest management.

Furthermore, the result of Amujiri et al., (2025) found that family size interacts with other socio-economic variables such as income, education and access to resources to determine conservation outcomes. Amuyou et al. (2022) further found that in many cases, the negative impact

of large household size on forest conservation is exacerbated by poverty and low levels of environmental awareness. Fatoki, Thompson, Ojo, Oyerinde & Olarewaju (2021) indicated that socio-economic characteristics, including household size, significantly influence conservation behavior and the adoption of sustainable practices. Thus, in Akamkpa, the effect of family size on forest conservation cannot be examined in isolation but must be understood within a broader socio-economic context.

Conclusion

The study established that both income level and family size are significant determinants of forest resource conservation in Akamkpa Local Government Area of Cross River State. Low-income households tend to rely heavily on forest resources for livelihood, which increases the rate of exploitation and forest degradation. At the same time, large family sizes create additional pressure on forest resources due to higher consumption needs and increased demand for land, fuelwood, and other forest products.

The findings demonstrate that forest conservation cannot be achieved solely through environmental policies or enforcement mechanisms without addressing the socio-economic realities of rural communities. Sustainable forest management in Akamkpa requires a holistic approach that integrates poverty reduction, livelihood diversification, environmental education, and community participation. Therefore, improving household income opportunities and promoting responsible family planning are critical strategies for reducing pressure on forest resources and ensuring long-term environmental sustainability.

Recommendations

1. Government and development agencies should promote alternative livelihood programmes such as agroforestry, small-scale enterprises, and vocational training to reduce dependence on forest resources among low-income households.
2. Community-based forest conservation education programmes should be strengthened to increase awareness of sustainable resource use and the long-term benefits of forest conservation.

3. Family planning and population management initiatives should be encouraged in rural communities to help control household size and reduce pressure on forest resources.
4. Financial support mechanisms such as microcredit and cooperative schemes should be provided to rural dwellers to enhance income generation and support sustainable livelihood practices.
5. Government should improve enforcement of forest conservation policies while ensuring community participation in decision-making processes to enhance compliance and promote sustainable forest management.

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