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Socio-Economic Predictors of Forest Degradation in Ikom Education Zone, Cross River State, Nigeria.

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Abstract

This study examined the socioeconomic predictors of forest degradation in the Ikom Education Zone of Cross River State. Specifically, the study investigated the extent to which household income level, primary occupational activity, and level of formal education predict forest degradation in the study area. The study was guided by research questions and hypotheses, and a correlational survey research design was adopted. The population of the study consisted of 184,570 adult residents in forest-dependent communities across Ikom, Boki, and Etung Local Government Areas. A sample of 400 respondents was selected using the Taro Yamane sampling technique and a multi-stage sampling procedure. Data were collected using a structured questionnaire titled "Socioeconomic Predictors of Forest Degradation Questionnaire (SPFDQ)" and analyzed using simple linear regression and multiple regression analysis at a 0.05 level of significance. The findings revealed that household income level significantly predicts forest degradation in the study area, with low-income households more likely to depend on forest resources, thereby increasing degradation. It was also found that primary occupational activity significantly predicts forest degradation, as forest-dependent occupations such as farming, logging, and fuelwood collection contribute to forest ecosystem decline. Furthermore, level of formal education was found to significantly predict forest degradation, with higher educational attainment associated with reduced forest exploitation and improved environmental awareness. The study concluded that socioeconomic factors play a crucial role in forest degradation in the Ikom Education Zone. It was recommended that policies aimed at poverty reduction, livelihood diversification, environmental

	education, and sustainable land-use practices should be strengthened to reduce pressure on forest resources and promote sustainable forest management.

INTRODUCTION

Forests are among the world's most valuable natural resources, providing ecological, economic, and social benefits that support livelihoods and environmental sustainability. They conserve biodiversity, regulate climate, protect soil and water resources, sequester carbon, and supply timber and non-timber products essential to millions of people (FAO, 2020; UNEP, 2021). Despite these benefits, forests face increasing degradation due to human activities such as unsustainable logging, agricultural expansion, fuelwood extraction, mining, and infrastructure development. Forest degradation involves a decline in forest quality, biodiversity, productivity, and ecological functions without complete forest removal, distinguishing it from deforestation (FAO, 2020). It has become a major environmental challenge, particularly in tropical developing countries where dependence on forest resources remains high.

Research shows that socioeconomic conditions strongly influence forest resource use and degradation patterns. Household income, occupation, and educational attainment shape environmental behavior, land-use decisions, and conservation practices (Curtis et al., 2018; Pendrill et al., 2022). Understanding these factors is therefore essential for developing effective forest management and rural development strategies.

In Sub-Saharan Africa, poverty and limited livelihood opportunities increase reliance on forests for fuelwood, timber, charcoal production, hunting, and non-timber forest products (Angelsen et al., 2018). Low-income households often depend heavily on these resources, contributing to forest degradation. While higher incomes may reduce direct dependence through access to alternative livelihoods and energy sources, they can also encourage commercial exploitation through agriculture and logging investments (Miller et al., 2020). Nigerian studies similarly indicate that household income significantly influences forest resource utilization and environmental outcomes (Idumah et al., 2021; Nkamleu & Kielland, 2019).

Occupational activity is another important determinant of forest degradation. Farming, the dominant occupation in many rural communities, drives forest loss through agricultural expansion, shifting cultivation, and slash-and-burn practices (Curtis et al., 2018; FAO, 2022). Other occupations, including logging, fuelwood collection, hunting, and mining, also contribute to ecosystem decline. In Cross River State, agricultural expansion and unsustainable farming practices continue to threaten forest sustainability and biodiversity (Bisong & Bassey, 2020; Ndifon, 2026).

Education also influences environmental awareness and conservation behavior. Formal education improves understanding of environmental issues, encourages sustainable resource use, and promotes participation in conservation initiatives (UNESCO, 2021). Educated individuals are more likely to support conservation policies and adopt environmentally friendly practices, whereas limited education may contribute to unsustainable exploitation of forest resources (Ardoin et al., 2020; Otto & Pensini, 2017).

Nigeria's tropical rainforest ecosystems, particularly those in Cross River State, are among the most biologically diverse in Africa. However, increasing population pressure, agricultural expansion, timber exploitation, urbanization, and infrastructure development have accelerated forest degradation (Aju & Offiong, 2019; FAO, 2022). Cross River State contains the country's largest remaining rainforest and hosts several protected areas that support biodiversity and local livelihoods (Amuyou et al., 2021). Nevertheless, timber harvesting, agricultural encroachment, and fuelwood extraction continue to threaten forest ecosystems (Bisong et al., 2021; Itu et al., 2025).

The Ikom Education Zone lies within this rainforest belt and contains communities that depend heavily on agriculture, timber extraction, and non-timber forest products. Population growth, poverty, and increasing demand for farmland have intensified pressure on forest resources (Aju & Offiong, 2019). Recent studies identify agricultural expansion, slash-and-burn farming, and unsustainable land-use practices as major threats to forest sustainability in the area (Ndifon, 2026). These activities contribute to habitat fragmentation, biodiversity loss, and declining ecosystem services.

Although previous studies have examined biodiversity conservation, climate change, REDD+ initiatives, and livelihood impacts in Cross River State, limited attention has been given to the socioeconomic drivers of forest degradation in the Ikom Education Zone. In particular, the predictive roles of household income, occupational activity, and educational attainment remain underexplored. This gap limits the capacity of policymakers and environmental managers to design effective interventions.

Given the growing recognition that environmental challenges are closely linked to socioeconomic conditions (IPBES, 2019), understanding these relationships is essential for sustainable forest management. Therefore, this study investigates the socioeconomic predictors of forest degradation in the Ikom Education Zone of Cross River State, focusing on household income level, primary occupational activity, and educational attainment. The findings are expected to support evidence-based environmental policies, community development initiatives, and biodiversity conservation efforts in Cross River State and Nigeria.

Statement of the Problem

Forest degradation remains a major environmental challenge in Nigeria, particularly in forest-dependent communities where livelihoods rely heavily on forest resources. In Cross River State, despite conservation efforts, increasing agricultural expansion, timber harvesting, fuelwood collection, and other human activities continue to degrade forest ecosystems, resulting in biodiversity loss, declining vegetation cover, and reduced ecosystem productivity.

The Ikom Education Zone is rich in forest resources and supports communities that depend largely on agriculture and forest-based livelihoods. However, growing pressure on these resources has accelerated forest degradation, threatening environmental sustainability and local livelihoods. While previous studies have focused on the ecological and conservation dimensions of forest degradation, limited attention has been given to the socioeconomic factors that drive individuals and households to engage in activities that contribute to forest degradation within the zone.

In particular, the influence of household income level, primary occupational activity, and level of formal education on forest degradation remains insufficiently understood. This knowledge gap limits the development of effective policies and community-based conservation strategies. Therefore, this study seeks to examine the extent to which these socioeconomic variables predict forest degradation in the Ikom Education Zone of Cross River State, with a view to providing evidence for sustainable forest management and environmental conservation.

RESEARCH QUESTIONS

The following research questions were formulated to guide the study:

1. To what extent does household income level predict forest degradation in the Ikom Education Zone of Cross River State?
2. To what extent does primary occupational activity predict forest degradation in the Ikom Education Zone of Cross River State?
3. To what extent does level of formal education predict forest degradation in the Ikom Education Zone of Cross River State?

RESEARCH HYPOTHESES

The following null hypotheses were formulated and tested at the 0.05 level of significance:

1. Household income level does not significantly predict forest degradation in the Ikom Education Zone of Cross River State.
2. Primary occupational activity does not significantly predict forest degradation in the Ikom Education Zone of Cross River State.
3. Level of formal education does not significantly predict forest degradation in the Ikom Education Zone of Cross River State.

LITERATURE REVIEW

Household Income Level and Forest Degradation

Household income is a major socioeconomic factor influencing forest resource utilization and degradation. In many developing countries, forests provide food, fuelwood, timber, medicinal plants, and other products that support rural livelihoods. Consequently, income level affects the degree of dependence on forest resources and patterns of forest exploitation (Angelsen et al., 2018).

The relationship between income and forest degradation is complex. Low-income households often rely heavily on forests for survival, engaging in activities such as fuelwood collection, charcoal production, hunting, and timber extraction, which may contribute to degradation when carried out unsustainably. Conversely, higher income can reduce forest dependence through alternative livelihood opportunities and access to cleaner energy sources. However, increased income may also encourage agricultural expansion and commercial exploitation of forest resources (Meyfroidt et al., 2022).

Empirical studies support the importance of income in forest management. Angelsen et al. (2018) found that poor households derive a substantial portion of their income from forests, making them more dependent on forest resources. Similarly, Chukwuone et al. (2020) reported that higher-

income households were more likely to adopt sustainable forest management practices. In Cross River State, Amuyou et al. (2021) observed that improved income opportunities increased community support for conservation initiatives, while Idumah et al. (2021) found that limited income alternatives encouraged dependence on forest-based livelihoods.

Although previous studies recognize income as an important determinant of forest utilization, findings remain inconsistent regarding its specific influence on forest degradation. Consequently, further investigation is required to determine the extent to which household income predicts forest degradation in the Ikom Education Zone.

Primary Occupational Activity and Forest Degradation

Primary occupation determines the level of interaction between individuals and forest resources. Occupations such as farming, logging, hunting, fuelwood collection, and harvesting of non-timber forest products involve direct use of forest ecosystems and can contribute to degradation when practiced unsustainably.

The Sustainable Livelihoods Framework suggests that livelihood activities influence natural resource use and environmental outcomes. Households whose occupations depend directly on forests generally exert greater pressure on forest ecosystems than those engaged in non-forest-based activities (Angelsen et al., 2018).

Agriculture is widely recognized as one of the leading causes of forest degradation. Curtis et al. (2018) identified agricultural expansion as a principal driver of forest loss in tropical regions. In Nigeria, farming remains the dominant occupation in many forest communities, and practices such as slash-and-burn farming and shifting cultivation have contributed significantly to forest degradation. Friant et al. (2019) reported that farming was the major occupation among households living near forest frontiers in Cross River State.

Studies in Cross River State have linked farming, logging, and forest-product harvesting to increasing pressure on forest ecosystems (Amuyou et al., 2021). Ndifon (2026) found that agricultural expansion and unsustainable farming practices significantly affected forest sustainability in the Ikom Education Zone, while Itu et al. (2025) reported that intensive timber extraction accelerated forest degradation across the state.

Although previous studies have established a relationship between occupation and forest degradation, empirical evidence specifically examining the predictive contribution of occupational activity within the Ikom Education Zone remains limited. This gap justifies further investigation.

Level of Formal Education and Forest Degradation

Education is widely regarded as an important tool for environmental conservation and sustainable development. Formal education equips individuals with knowledge, skills, and values that influence environmental awareness and resource-use decisions. As such, educational attainment is often linked to environmental behavior and forest conservation.

Human Capital Theory suggests that education improves individuals' capacity to make informed decisions and adopt sustainable practices (Becker, 1993). Educated individuals are generally more aware of environmental challenges and more likely to support conservation initiatives than those with limited education.

Several studies have reported positive relationships between education and environmental stewardship. Otto and Pensini (2017) found that higher educational attainment was associated with stronger pro-environmental attitudes, while Ardoin et al. (2020) noted that environmental education promotes conservation-oriented behavior. UNESCO (2021) also emphasized that education encourages sustainable lifestyles and participation in environmental governance.

Empirical evidence from developing countries indicates that educated households are generally less dependent on forest resources because they have access to alternative livelihood opportunities (Nkamleu & Kielland, 2019; Miller et al., 2020). In Nigeria, Oruonye and Ahmed (2020) found that environmental awareness was significantly higher among individuals with secondary and tertiary education. Similarly, studies in Cross River State revealed that educated community members were more likely to participate in forest conservation programmes and support sustainable forest management practices (Amuyou et al., 2021; Bisong et al., 2021).

Within the Ikom Education Zone, educational attainment has been linked to awareness and adoption of sustainable land-use practices. Ndifon (2026) reported that respondents with higher levels of education demonstrated greater understanding of environmental conservation measures than their less educated counterparts.

Despite substantial evidence linking education to environmental conservation, findings remain inconclusive regarding its specific influence on forest degradation. While education often promotes conservation behavior, it may also create economic opportunities that increase resource exploitation. Consequently, there is a need to investigate the predictive influence of formal education on forest degradation in the Ikom Education Zone.

Summary of Literature Review

The reviewed literature identifies household income, occupational activity, and formal education as important socioeconomic factors influencing forest resource utilization and environmental outcomes. Low income often increases dependence on forest resources, occupation determines the intensity of interaction with forests, and education shapes environmental awareness and conservation behavior. Although previous studies have examined these variables separately, limited empirical evidence exists on their combined predictive influence on forest degradation in the Ikom Education Zone of Cross River State. This knowledge gap provides the basis for the present study.

3.0 Methodology

3.1 Research Design

This study adopted a correlational survey research design. The design was appropriate because it enabled the researcher to examine the predictive relationships between selected socioeconomic variables—household income level, primary occupational activity, and level of formal education—and forest degradation in the Ikom Education Zone of Cross River State.

3.2 Population of the Study

The population comprised all adult residents of selected forest-dependent communities in the Ikom Education Zone of Cross River State, which consists of Ikom, Boki, and Etung Local Government Areas. These areas are located within the tropical rainforest belt and are characterized by extensive

forest resources and forest-based livelihood activities. According to records from the Departments of Planning, Research and Statistics of the three Local Government Councils (2025), the total population of adult residents was 184,570. The target population included household heads and other adults engaged in farming, logging, hunting, fuelwood collection, forest-product trading, civil service, and related occupations. These residents were considered suitable because of their direct or indirect interaction with forest resources.

Table 1: Distribution of Population

Local Government Area	Population
Ikom	62,430
Boki	78,215
Etung	43,925
Total	**184,570**

Source: Departments of Planning, Research and Statistics, Ikom, Boki and Etung Local Government Councils (2025).

3.3 Sample and Sampling Technique

A sample of 400 respondents was selected for the study. The sample size was determined using the Taro Yamane (1967) formula and rounded up from 399 to 400 for ease of distribution and improved representation.

A multistage sampling procedure was adopted. First, the three Local Government Areas— Ikom, Boki, and Etung—were purposively selected because of their extensive forest resources and dependence on forest-based livelihoods. Second, four communities were selected from each Local Government Area through simple random sampling, giving a total of twelve communities. Third, the sample was proportionately allocated to the selected Local Government Areas according to their population sizes. Finally, respondents were selected from the sampled communities using accidental sampling, whereby available and willing adult residents were approached and included in the study until the required number of respondents was obtained.

Table 2: Distribution of Population and Sample Size by Local Government Area

Local Government Area	Population	Percentage (%)	Sample Size
Ikom	62,430	33.8	135
Boki	78,215	42.4	170
Etung	43,925	23.8	95
Total	**184,570**	**100.0**	**400**

Table 3: Distribution of Sample Size across Selected Communities

Local Government Area	Selected Community	Sample Size
Ikom	Ikom Urban	35

Local Government Area	Selected Community	Sample Size
Ikom	Akparabong	34
Ikom	Nde	33
Ikom	Olulumo	33
Subtotal		**135**
Boki	Boje	43
Boki	Okundi	42
Boki	Kakwagom	43
Boki	Buentsebe	42
Subtotal		**170**
Etung	Effraya	24
Etung	Abia	24
Etung	Agbokim	24
Etung	Etomi	23
Subtotal		**95**
Grand Total	**12 Communities**	**400**

The multistage sampling procedure ensured broad coverage of forest-dependent communities within the study area, while the use of accidental sampling at the final stage facilitated access to respondents with relevant knowledge and experience regarding forest resource utilization and degradation. This approach enhanced the representativeness of the sample and the validity of the study findings.

PRESENTATION OF RESULTS

Hypothesis One

Household income level does not significantly predict forest degradation in the Ikom Education Zone of Cross River State.

To test this hypothesis, simple linear regression analysis was conducted using household income level as the predictor variable and forest degradation as the criterion variable. The result is presented in Table 4.

Table 4: Simple Regression Analysis of Household Income Level as a Predictor of Forest Degradation

Variable	B	Std. Error	Beta (β)	t-value	Sig.
Constant	32.416	2.118	-	15.305	.000
Household Income Level	-0.487	0.072	-0.326	-6.764	.000

Model Summary

R	R^2	Adjusted R^2	F-value	Sig.
0.326	0.106	0.104	45.751	.000

Decision Rule: Reject the null hypothesis if the p-value is less than 0.05.
Decision: Since the obtained p-value (.000) is less than the 0.05 level of significance, the null hypothesis was rejected.

Interpretation: The result revealed that household income level significantly predicts forest degradation in the Ikom Education Zone of Cross River State ($\beta = -0.326$, $t = -6.764$, $p < .05$). The coefficient of determination ($R^2 = 0.106$) indicates that household income level accounted for 10.6% of the variance in forest degradation. The negative beta coefficient suggests that higher household income levels are associated with lower levels of forest degradation. This implies that as household income increases, dependence on forest resources tends to decrease, thereby reducing activities that contribute to forest degradation.
Therefore, household income level is a significant predictor of forest degradation in the Ikom Education Zone of Cross River State.

Hypothesis Two
H_{o2}: Primary occupational activity does not significantly predict forest degradation in the Ikom Education Zone of Cross River State.
To test this hypothesis, simple linear regression analysis was conducted using primary occupational activity as the predictor variable and forest degradation as the criterion variable. The result of the analysis is presented in Table 4.2.

Table 5: Simple Regression Analysis of Primary Occupational Activity as a Predictor of Forest Degradation

Variable	B	Std. Error	Beta (β)	t-value	Sig.
Constant	28.573	1.964	-	14.548	.000
Primary Occupational Activity	0.614	0.065	0.427	9.446	.000

Model Summary

R	R^2	Adjusted R^2	F-value	Sig.
0.427	0.182	0.180	89.226	.000

Decision Rule: Reject the null hypothesis if the probability value (p-value) is less than the 0.05 level of significance.

Decision: Since the obtained p-value (.000) is less than the 0.05 level of significance, the null hypothesis was rejected.

Interpretation: The result revealed that primary occupational activity significantly predicts forest degradation in the Ikom Education Zone of Cross River State ($\beta = 0.427$, $t = 9.446$, $p < .05$). The coefficient of determination ($R^2 = 0.182$) indicates that primary occupational activity accounted for 18.2% of the variance in forest degradation. The positive beta coefficient suggests that occupational activities with greater dependence on forest resources are associated with increased levels of forest degradation.

This finding implies that occupations such as farming, logging, hunting, fuelwood collection, and other forest-based livelihood activities contribute significantly to forest degradation within the study area. Therefore, primary occupational activity is a significant predictor of forest degradation in the Ikom Education Zone of Cross River State.

Based on the result, the null hypothesis stating that primary occupational activity does not significantly predict forest degradation in the Ikom Education Zone of Cross River State was rejected.

Table 6: Simple Regression Analysis of Level of Formal Education as a Predictor of Forest Degradation

Variable	B	Std. Error	Beta (β)	t-value	Sig.
Constant	35.284	2.145	-	16.450	.000
Level of Formal Education	-0.538	0.081	-0.315	-6.642	.000

Model Summary

R	R^2	Adjusted R^2	F-value	Sig.
0.315	0.099	0.097	44.116	.000

Decision Rule: Reject the null hypothesis if the p-value is less than 0.05.

Decision: Since the obtained p-value (.000) is less than the 0.05 level of significance, the null hypothesis was rejected.

Interpretation: The result revealed that level of formal education significantly predicts forest degradation in the Ikom Education Zone of Cross River State ($\beta = -0.315$, $t = -6.642$, $p < .05$). The coefficient of determination ($R^2 = 0.099$) indicates that level of formal education accounted for 9.9% of the variance in forest degradation.

The negative beta coefficient suggests an inverse relationship between level of formal education and forest degradation. This implies that individuals with higher levels of formal education are less likely to engage in activities that contribute to forest degradation. Higher educational attainment may enhance environmental awareness, promote positive conservation attitudes, and encourage the adoption of sustainable resource management practices.

Therefore, level of formal education is a significant predictor of forest degradation in the Ikom Education Zone of Cross River State. Based on this finding, the null hypothesis stating that level of formal education does not significantly predict forest degradation was rejected.

Discussion of Findings

The study examined household income level, primary occupational activity, and level of formal education as predictors of forest degradation in the Ikom Education Zone of Cross River State.

The findings revealed that household income level significantly predicts forest degradation. Households with lower incomes were more dependent on forest resources for livelihood and energy needs, thereby increasing pressure on forest ecosystems. This finding supports previous studies which identified poverty and limited livelihood opportunities as major drivers of forest resource exploitation and degradation.

The study also found that primary occupational activity significantly predicts forest degradation. Occupations such as farming, logging, hunting, fuelwood collection, and non-timber forest product harvesting were associated with increased forest resource use and environmental degradation. This result aligns with studies that identified agricultural expansion and forest-based livelihoods as major contributors to forest decline.

Furthermore, level of formal education significantly predicted forest degradation. Higher educational attainment was associated with lower involvement in activities that degrade forests. Educated individuals were more likely to demonstrate environmental awareness, adopt sustainable practices, and support conservation initiatives.

Overall, the findings indicate that socioeconomic factors play a crucial role in influencing forest degradation within the study area.

Summary of Findings

The study established that:

1. Household income level significantly predicts forest degradation, with lower-income households exhibiting greater dependence on forest resources.
2. Primary occupational activity significantly predicts forest degradation, particularly occupations directly dependent on forest resources.
3. Level of formal education significantly predicts forest degradation, with higher educational attainment associated with lower levels of forest degradation.

Conclusion

The study concludes that forest degradation in the Ikom Education Zone is strongly influenced by socioeconomic factors. Low household income increases dependence on forest resources, forest-based occupations intensify pressure on forest ecosystems, and higher levels of education promote environmentally responsible behaviour. Therefore, effective forest conservation requires not only ecological interventions but also socioeconomic measures that address poverty, livelihood needs, and environmental awareness.

Recommendations

1. Government and development agencies should implement income-generating and poverty-reduction programmes to reduce dependence on forest resources.
2. Sustainable livelihood options such as agroforestry, beekeeping, fish farming, and improved agricultural practices should be promoted.
3. Environmental education and awareness programmes should be strengthened in schools and local communities.
4. Adult education and community sensitization programmes should be expanded to improve environmental literacy and sustainable resource management practices.

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