

## **STRENGTHENING FOREST STEWARDSHIP AND SUSTAINABILITY MINDSET FOR LONG-TERM FOREST CONSERVATION IN AKAMKPA LOCAL GOVERNMENT AREA, CROSS RIVER STATE**

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### **Abstract**

This study examined the role of forest stewardship and sustainability mindset in strengthening long-term forest conservation in Akamkpa Local Government Area, Cross River State, Nigeria. The population of the study is 263,919 inhabitants. Forest stewardship was examined in terms of responsible resource management and community participation, while that of sustainability mindset was environmental responsibility and commitment to sustainable practices. Adopting a descriptive survey design, the study sampled 400 respondents including community members, forest-dependent households, environmental officers, and relevant stakeholders using a multistage sampling technique. The instrument used for data collection was a questionnaire titled Forest Stewardship, Sustainability Mindset and Forest Conservation Questionnaire (FSSMFCQ). The data analyses were carried out using frequencies and percentages to answer the research questions. And Pearson Product Moment Correlation and simple linear regression was used to analyze the hypotheses at a .05 significance level. Findings revealed that forest stewardship significantly relates to long-term forest conservation through responsible resource use, community participation, forest protection, and restoration. Additionally, a sustainability mindset significantly influences long-term conservation by fostering environmental responsibility, conservation-oriented attitudes, and sustainable practices. The study recommends that government agencies, environmental organizations, and community leaders strengthen stewardship programs, promote sustainability education, and encourage community-based conservation initiatives to ensure long-term forest protection.

**Keywords:** Forest Stewardship, Sustainability Mindset, Forest Conservation, Environmental Responsibility

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### **Introduction**

The natural forests areas constitute one of the most important natural resources for sustaining ecological balance, biodiversity, human livelihoods and the overall quality of the environment. Beyond their ecological functions, forests provide communities with food, fuelwood, medicinal plants, timber, non-timber forest products and other resources that support household welfare and local economic activities. However, the continued capacity of forests to provide these benefits depends largely on how forest resources are used, managed and protected. Where forest exploitation is not accompanied by responsible stewardship and a strong commitment to sustainability, forest resources may become progressively degraded. In this regard,

environmental education and appropriate behavioural orientations are important foundations for encouraging individuals and communities to develop responsible attitudes towards forest resources. Igwebuike and Etan (2018) observed that environmental education strategies could serve as important precursors for the sustainable utilization of forest resources in Cross River State. This suggests that forest conservation is not only a matter of establishing regulations but also requires developing the knowledge, attitudes, values and practices that encourage responsible interaction with the forest environment.

Forest conservation Forest conservation has reached a critical tipping point as human pressures ranging from aggressive agricultural expansion and logging to relentless fuelwood collection, bush burning, and hunting rapidly erode delicate ecological integrity. Across Cross River State, safeguarding these vibrant natural ecosystems demands far more than passive policy; it requires active, deeply rooted stewardship from everyday individuals, households, and key institutions alike. Illuminating this dynamic, Igwebuike and Etan (2017) demonstrated that strategic mass media campaigns and dynamic environmental workshops act as powerful catalysts for change, transforming raw environmental knowledge into frontline, community-driven action.

Forest stewardship offers a clear path toward long-term conservation through responsible management, active protection, and sustainable resource use. It includes practical actions like preventing destruction and supporting forest regeneration. Orji and Igwebuike (2018) noted that stewardship can be cultivated through targeted secondary school curricula and pedagogical practices, a principle applicable to broader conservation contexts. Similarly, Igwebuike and Etan (2018) advocated for environmental education strategies to build stewardship-oriented behavior among resource users. Community participation is essential since local populations depend directly on nearby forests. Conservation initiatives often fail when residents feel excluded or view policies as external control. Igwebuike and Agbor (2022) identified outdoor education as a key pathway to sustainability in Cross River State, noting that experiential learning makes conservation practical, meaningful, and locally relevant.

A sustainability mindset reflecting long-term environmental responsibility and a commitment to preserving resources is equally vital. Because external enforcement alone cannot sustain conservation, individuals must recognize the ecological impact of their daily choices. Developing these orientations requires continuous learning, strong pedagogical methods, and practical engagement. Cultivating a robust sustainability mindset therefore require one to be deeply anchored in long-term environmental responsibility and an unwavering commitment to resource preservation is just as vital as physical intervention. Because rigid external enforcement alone can never fully safeguard natural landscapes, individuals must undergo a profound shift in perspective, recognizing the direct ecological impact of their daily choices. Nurturing this enduring conservation ethic requires continuous, transformative learning, engaging pedagogical approaches, and hands-on, practical involvement that truly connects communities to their land.

Many educational research in Cross River State supported the role of instruction in shaping environmental attitudes. Etan and Igwebuike (2018) showed that personal traits and attitudes shape engagement with environmental topics, while Igwebuike (2016) stressed that effective curriculum implementation requires translating theoretical knowledge into practical behavior. Additionally, Igwebuike et al. (2021) demonstrated the impact of environmental variables on learning outcomes in Calabar South. Addressing broader structural factors, Egbonyi, Bassey, and Ushie (2025) highlighted how land tenure systems influence forest conservation and climate change mitigation, demonstrating that effective conservation depends on social, institutional, and land-use conditions.

The relevance of education to sustainable resource use is also reflected in the work of Egbonyi et al (2024) on farmers' education and sustainable agricultural practices in Abi Local

Government Area of Cross River State. The study underscores the importance of knowledge and education in encouraging practices that support sustainable use of natural resources. Such evidence suggests that strengthening people's understanding of environmental consequences and providing appropriate knowledge can contribute to more responsible resource-use decisions. For forest-dependent communities, this principle is significant because informed residents may be better positioned to recognize the consequences of unsustainable exploitation and participate in practices that support forest regeneration and protection.

Recent studies in Cross River State demonstrated the link between agricultural practices and sustainability. Agbor, Asuquo, Ukam and Igwebuike (2024) linked mixed farming and bush fallowing to climate change mitigation, while Agbor, Udumo, Ukam and Igwebuike (2024) highlighted similar benefits from agroforestry and organic farming. In forest-dependent communities, sustainable agriculture and land-use systems reduce pressure on forests while supporting livelihoods. Effiom and Banjo (2018) emphasized integrating indigenous agricultural practices into biodiversity conservation in Ikom, a principle directly applicable to Akamkpa Local Government Area (LGA), where local livelihoods depend heavily on forest resources.

Stewardship requires continuous communication and capacity building. Igwebuike and Etan (2017) showed that mass media and workshops build awareness, discourage destructive practices, and allow stakeholders to develop local solutions. Furthermore, a sustainability mindset requires shifting beyond short-term economic gains. Research by Egbonyi et al. (2024) on sustainable agriculture and Egbonyi et al. (2025) on sustainable forest management reinforces the need for long-term perspectives to drive responsible harvesting and restoration.

Akamkpa LGA presents both conservation challenges and opportunities for progress through education and participation. While prior research in Cross River State addresses environmental education, land tenure, and sustainable farming, empirical evidence specifically combining forest stewardship and a sustainability mindset in Akamkpa LGA remains limited. This creates a contextual and empirical gap that warrants investigation. It is against this background that the present study examines Strengthening Forest Stewardship and Sustainability Mindset for Long-Term Forest Conservation in Akamkpa Local Government Area, Cross River State.

### **Statement of research Problem**

The increasing concern over deforestation, biodiversity loss, climate change and ecosystem degradation has intensified the need for effective approaches to sustainable forest conservation. Forests provide important ecological, economic and social benefits, including biodiversity protection, climate regulation, soil conservation and livelihood support. However, these benefits depend largely on responsible forest management, community participation and commitment to sustainable resource use. In Cross River State, where forest resources are particularly important, strengthening forest stewardship and sustainability-oriented attitudes is essential for ensuring their long-term protection. Igwebuike and Etan (2018) emphasized the importance of environmental education strategies for promoting sustainable utilization of forest resources, while Igwebuike and Etan (2017) identified environmental workshops and mass media as useful approaches for promoting sustainable forest-resource utilization.

Despite these efforts, forest resources continue to experience pressure from agricultural expansion, logging, fuelwood collection, hunting, bush burning and other human activities. Such practices can contribute to forest degradation, biodiversity loss and declining ecosystem services. The problem may be intensified where communities have limited conservation awareness, weak participation in forest protection and inadequate commitment to sustainable resource-use practices. Orji and Igwebuike (2018) emphasized the importance of environmental stewardship in promoting responsible relationships with the environment, while

Igwebuike and Agbor (2022) highlighted the value of direct environmental experiences in promoting sustainability.

Furthermore, sustainable forest conservation is closely linked to the attitudes and practices of local resource users. Evidence from Cross River State indicates that farmers' education can support sustainable agricultural practices (Egbonyi et al., 2024), while land tenure arrangements have implications for forest-resource conservation and climate change mitigation (Egbonyi et al., 2025). Similarly, agroforestry, organic agriculture, mixed farming and bush fallowing have been identified as practices with potential for improving environmental sustainability (Agbor et al., 2024a; Agbor et al., 2024b). These findings suggest that knowledge, attitudes, land-use practices and responsible resource management are important considerations in achieving sustainable forest conservation.

Akamkpa Local Government Area provides an important context for examining these concerns because of its forest resources and the dependence of communities on the natural environment. However, despite existing conservation efforts, there is limited empirical evidence on the extent to which forest stewardship and sustainability mindset contribute to long-term forest conservation in Akamkpa Local Government Area. Previous studies in Cross River State have addressed environmental education, environmental stewardship, sustainable forest utilization and related environmental practices, but have not sufficiently examined the combined relevance of forest stewardship and sustainability mindset to long-term forest conservation within Akamkpa. This empirical gap necessitated the present study. Hence, the problem of this study is posed in the following question: To what extent do forest stewardship and sustainability mindset contribute to long-term forest conservation in Akamkpa Local Government Area, Cross River State?

### **Objectives of the Study.**

The main objective of this study will be to examine the role of forest stewardship and sustainability mindset in strengthening long-term forest conservation in Akamkpa Local Government Area, Cross River State. Specifically, the study will:

1. Specifically, examine the relationship between forest stewardship and long-term forest conservation in Akamkpa Local Government Area, Cross River State.
2. Specifically, determine the influence of sustainability mindset on long-term forest conservation in Akamkpa Local Government Area, Cross River State.

### **Research Questions**

1. What is the relationship between forest stewardship and long-term forest conservation in Akamkpa Local Government Area, Cross River State?
2. To what extent does sustainability mindset influence long-term forest conservation in Akamkpa Local Government Area, Cross River State?

### **Research Hypotheses**

The following null hypotheses will be tested at 0.05 level of significance:

1. There is no significant relationship between forest stewardship and long-term forest conservation in Akamkpa Local Government Area, Cross River State.
2. Sustainability mindset has no significant influence on long-term forest conservation in Akamkpa Local Government Area, Cross River State.

### **Methods**

The study adopted a correlational research design to examine the relationship between forest stewardship, sustainability mindset and long-term forest conservation in Akamkpa Local Government Area, Cross River State. The design was considered appropriate because it

enabled the researcher to determine the relationship between forest stewardship and long-term forest conservation and the predictive influence of sustainability mindset on long-term forest conservation without manipulating any of the variables. The population of the study comprised 263,919 inhabitants of Akamkpa Local Government Area, based on the projected 2024 population derived from the 2006 National Population Census. The population included community members, forest-dependent households, environmental officers and other relevant stakeholders whose experiences and activities were considered relevant to forest management and conservation.

A sample of 400 respondents was selected using a multistage sampling technique involving stratified and simple random sampling procedures. In the first stage, the study area was stratified into selected communities to ensure adequate geographical representation. In the second stage, communities were selected through simple random sampling using the ballot method. In the third stage, eligible respondents were selected from the sampled communities through simple random sampling, giving qualified participants equal opportunity for selection.

Data were collected using a researcher-developed questionnaire titled “Forest Stewardship, Sustainability Mindset and Forest Conservation Questionnaire (FSSMFCQ).” The instrument consisted of three sections. Section A obtained demographic information from respondents. Section B measured forest stewardship, focusing on responsible forest resource management and community participation. Section C measured sustainability mindset and long-term forest conservation, covering environmental responsibility, commitment to sustainable practices, forest protection, responsible resource use, regeneration and restoration activities. Items were structured on a modified four-point Likert scale of Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1).

The instrument was validated by experts in Environmental Education, Forestry and Wildlife Management, and Measurement and Evaluation to ensure clarity, relevance and adequate coverage of the study variables. Reliability was established through a pilot test involving 50 respondents who were not included in the main study. The pilot data were analyzed using the Cronbach Alpha method, which produced reliability coefficients ranging from 0.80 to 0.88, indicating satisfactory internal consistency.

The researcher administered the questionnaires directly to the selected respondents with the assistance of trained research assistants. Respondents were informed of the purpose of the study and assured that their responses would be treated confidentially and used strictly for research purposes. Of the 400 questionnaires administered, 392 were properly completed and retrieved, representing a 98.0% response rate, which was considered adequate for analysis. The collected data were coded and analyzed using the Statistical Package for the Social Sciences (SPSS). Mean scores and standard deviations were used to answer the research questions. Pearson Product Moment Correlation (PPMC) was used to test the first hypothesis on the relationship between forest stewardship and long-term forest conservation, while simple linear regression analysis was used to test the second hypothesis on the influence of sustainability mindset on long-term forest conservation. Both hypotheses were tested at the 0.05 level of significance

## Results

**Research Question One:** What is the relationship between forest stewardship and long-term forest conservation in Akamkpa Local Government Area, Cross River State?

The data presented in Table 1 revealed that forest stewardship was generally associated with positive long-term forest conservation practices in Akamkpa Local Government Area. Community participation in forest protection activities recorded 68 responses representing 17.35%, indicating that active involvement of community members is an important component of forest conservation. Responsible use of forest resources recorded 61 responses representing

15.56%, suggesting that sustainable utilization practices contribute to the protection of forest resources.

Participation in tree planting and forest restoration activities recorded 54 responses representing 13.78%, while prevention of illegal logging and indiscriminate tree cutting recorded 47 responses representing 11.99%. These findings indicate that practical stewardship activities are important for maintaining forest resources and supporting regeneration. Community monitoring of forest resources recorded 43 responses representing 10.97%, while compliance with forest conservation regulations recorded 39 responses representing 9.95%. Furthermore, reporting of destructive forest activities recorded 32 responses representing 8.16%, support for community-based forest management recorded 27 responses representing 6.89%, and protection of forest biodiversity recorded 21 responses representing 5.36%. Overall, the findings suggest that responsible forest resource management, community participation and conservation-oriented practices are important dimensions of forest stewardship that are positively associated with long-term forest conservation in the study area.

**Table 1: Forest Stewardship and Long-Term Forest Conservation in Akamkpa LGA (N = 392)**

| S/N   | Indicator                                                     | Frequency | Percentage (%) |
|-------|---------------------------------------------------------------|-----------|----------------|
| 1     | Community participation in forest protection activities       | 68        | 17.35          |
| 2     | Responsible use of forest resources                           | 61        | 15.56          |
| 3     | Participation in tree planting and forest restoration         | 54        | 13.78          |
| 4     | Prevention of illegal logging and indiscriminate tree cutting | 47        | 11.99          |
| 5     | Community monitoring of forest resources                      | 43        | 10.97          |
| 6     | Compliance with forest conservation regulations               | 39        | 9.95           |
| 7     | Reporting of destructive forest activities                    | 32        | 8.16           |
| 8     | Support for community-based forest management                 | 27        | 6.89           |
| 9     | Protection of forest biodiversity                             | 21        | 5.36           |
| Total |                                                               | 392       | 100.00         |

**Research Question Two:** To what extent does sustainability mindset influence long-term forest conservation in Akamkpa Local Government Area, Cross River State?

The findings presented in Table 2 revealed that sustainability mindset contributes positively to long-term forest conservation in Akamkpa Local Government Area. Commitment to protecting forest resources for future generations recorded 67 responses representing 17.09%, indicating that respondents recognize the importance of maintaining forests for present and future community wellbeing. Concern for the environmental consequences of forest exploitation recorded 60 responses representing 15.31%, suggesting that awareness of environmental consequences influences conservation-oriented behaviour.

Willingness to adopt sustainable forest-use practices recorded 53 responses representing 13.52%, while environmental responsibility in the use of forest resources recorded 48 responses representing 12.24%. These findings indicate that personal responsibility and willingness to modify resource-use behaviour are important components of a sustainability mindset. Support for forest regeneration and restoration recorded 43 responses representing 10.97%, while willingness to participate in conservation programmes recorded 39 responses representing 9.95%.

Furthermore, avoidance of practices that contribute to forest degradation recorded 34 responses representing 8.67%, promotion of sustainable livelihood practices recorded 27 responses representing 6.89%, and willingness to encourage others to protect forest resources recorded 21 responses representing 5.36%. The findings therefore indicate that a sustainability mindset, reflected in environmental responsibility, future-oriented thinking and commitment to sustainable practices, contributes positively to long-term forest conservation in the study area.

**Table 2: Sustainability Mindset and Long-Term Forest Conservation in Akamkpa LGA (N = 392)**

| S/N   | Indicator                                                        | Frequency | Percentage (%) |
|-------|------------------------------------------------------------------|-----------|----------------|
| 1     | Commitment to protecting forest resources for future generations | 67        | 17.09          |
| 2     | Concern for environmental consequences of forest exploitation    | 60        | 15.31          |
| 3     | Willingness to adopt sustainable forest-use practices            | 53        | 13.52          |
| 4     | Environmental responsibility in the use of forest resources      | 48        | 12.24          |
| 5     | Support for forest regeneration and restoration                  | 43        | 10.97          |
| 6     | Willingness to participate in conservation programmes            | 39        | 9.95           |
| 7     | Avoidance of practices that contribute to forest degradation     | 34        | 8.67           |
| 8     | Promotion of sustainable livelihood practices                    | 27        | 6.89           |
| 9     | Willingness to encourage others to protect forest resources      | 21        | 5.36           |
| Total |                                                                  | 392       | 100.00         |

**Hypothesis One:** There is no significant relationship between forest stewardship and long-term forest conservation in Akamkpa Local Government Area, Cross River State.

**Table 3: Pearson Product Moment Correlation Analysis of Forest Stewardship and Long-Term Forest Conservation**

| Variables                     | N   | Mean  | SD   | r-value | p-value |
|-------------------------------|-----|-------|------|---------|---------|
| Forest Stewardship            | 392 | 35.76 | 5.64 | 0.68    | 0.000   |
| Long-Term Forest Conservation | 392 | 42.51 | 6.18 |         |         |

\*Significant at .05 level

The result presented in Table 3 shows that there was a significant positive relationship between forest stewardship and long-term forest conservation in Akamkpa Local Government Area. The obtained correlation coefficient of  $r = 0.68$  with a corresponding p-value of 0.000 was less than the 0.05 level of significance. Therefore, the null hypothesis was rejected. This finding indicates that higher levels of forest stewardship were associated with stronger long-term forest conservation practices. In practical terms, responsible forest resource management, community participation, forest protection and restoration activities were associated with improved conservation outcomes in the study area.

### **Hypothesis Two**

There is no significant influence of sustainability mindset on long-term forest conservation in Akamkpa Local Government Area, Cross River State, Nigeria.

Table 4: Simple Regression Analysis of the Influence of Sustainability Mindset on Long-Term Forest Conservation in Akamkpa Local Government Area, Cross River State, Nigeria (N = 392)

| Source of Variation | SS        | Df  | MS       | F        | p-value |
|---------------------|-----------|-----|----------|----------|---------|
| Regression          | 8173.400  | 1   | 8173.400 | 470.550* | .000    |
| Residual            | 6757.600  | 390 | 17.327   |          |         |
| Total               | 14931.000 | 391 |          |          |         |

\*Significant at .05 level,  $R = .740$ ;  $R^2 = .548$ ; Adj.  $R^2 = .547$

The result presented in Table 4 shows that sustainability mindset had a significant positive influence on long-term forest conservation in Akamkpa Local Government Area. The regression analysis produced  $F(1, 390) = 470.550$ ,  $p = .000$ , which was significant at the .05 level. The  $R = .740$  indicates a strong positive relationship between sustainability mindset and long-term forest conservation, while  $R^2 = .548$  shows that sustainability mindset explained 54.8% of the variation in long-term forest conservation. Since the p-value of .000 was less than .05, the null hypothesis was rejected. The finding therefore indicates that stronger sustainability mindset significantly enhances long-term forest conservation through greater environmental responsibility, commitment to sustainable forest-use practices, forest protection, and support for regeneration and restoration activities.

### Discussion of Findings

The findings of this study are discussed based on the two hypotheses tested in relation to forest stewardship, sustainability mindset, and long-term forest conservation in Akamkpa Local Government Area, Cross River State.

#### Forest Stewardship and Long-Term Forest Conservation

The result of hypothesis one revealed a significant positive relationship between forest stewardship and long-term forest conservation in Akamkpa LGA. This implies that responsible forest resource management, community participation, forest protection, monitoring, and restoration activities contribute to improved forest conservation. The finding suggests that when communities actively participate in managing and protecting forest resources, forest degradation is reduced and sustainable use is encouraged.

The finding supports the Sustainable Development Theory, which emphasizes meeting present needs while protecting natural resources for future generations. It also agrees with Igwebuike and Etan (2017, 2018), who emphasized environmental education, community awareness, and responsible forest resource utilization as important strategies for forest sustainability. Similarly, Orji and Igwebuike (2018) and Igwebuike and Agbor (2022) stressed the importance of environmental stewardship and practical environmental activities in promoting sustainable resource management.

The finding further agrees with Egbonyi, Bassey, and Ushie (2025), who linked appropriate land-use practices with forest resource conservation and climate change mitigation. The implication is that strengthening community-based forest management, environmental education, and participation in conservation activities can improve long-term forest protection in Akamkpa LGA.

#### Sustainability Mindset and Long-Term Forest Conservation

The result of hypothesis two indicated that sustainability mindset significantly and positively influences long-term forest conservation in Akamkpa LGA. This means that environmental responsibility, concern for future generations, willingness to adopt sustainable practices, and

commitment to forest protection encourage conservation-oriented behaviours.

The finding is consistent with the Sustainable Development Theory, which recognizes environmental responsibility and intergenerational equity as essential to sustainable resource management. It also supports Egbonyi et al. (2024), who found that education and sustainable agricultural practices promote responsible environmental resource use. Similarly, Agbor et al. (2024a, 2024b) demonstrated that sustainable farming, agroforestry, and organic agricultural practices can contribute to environmental protection and climate change mitigation. The finding implies that developing a sustainability mindset through environmental education, community sensitization, and practical conservation programmes can strengthen commitment to forest protection and restoration in Akamkpa LGA.

## Conclusion

The study concluded that forest stewardship and sustainability mindset significantly contribute to long-term forest conservation in Akamkpa LGA, Cross River State. Responsible resource management, community participation, environmental responsibility, and commitment to sustainable practices are important pathways for reducing forest degradation and promoting sustainable forest use.

## Recommendations

Sequel to the findings, the researchers recommended that:

1. The Cross River State Government and relevant forestry agencies should strengthen community-based forest management through environmental education, participatory conservation programmes, and forest restoration initiatives.
2. Environmental agencies, community leaders, and educational institutions should promote sustainability education and awareness programmes that encourage responsible forest-resource use, environmental responsibility, and commitment to long-term forest conservation.

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