

ENVIRONMENTAL GOVERNANCE AND COMMUNITY COMPLIANCE WITH NATURAL RESOURCE CONSERVATION REGULATIONS IN CROSS RIVER STATE, NIGERIA.

Ekemini E. Idem, etuk.idem@unn.edu.ng

Centre of Excellence of Environmental Management and Green Energy (CEMAGE),
University of Nigeria, Enugu campus. University of Nigeria, Nsukka.

Ozorme Vivian Amarachi, vivian.amarachi@unn.edu.ng

Center for Excellence in Environmental Management and Green Energy (CEMAGE),
University of Nigeria, Enugu campus. University of Nigeria, Nsukka.

And

Sam, Ime Edet. Ph.D

Department of Environmental Education,
Faculty of Science Education,
College of Education, University of Calabar.

Corresponding author: Sam, Ime Edet. Ph.D, 08063987888, imesam12@yahoo.com



Abstract

This study examined environmental governance and community compliance with natural resource conservation regulations in Cross River State, Nigeria. The study investigated the influence of regulatory enforcement, community participation and institutional accountability on community compliance with natural resource conservation regulations. A cross-sectional descriptive survey design was adopted. The population comprised adult residents of selected communities around forest reserves, protected areas and other natural-resource conservation areas in Cross River State. A sample of 453 respondents was selected through multistage sampling. Data were collected using the Environmental Governance and Community Compliance with Natural Resource Conservation Regulations Questionnaire (EGCCNRCQ). Data were analysed using mean, standard deviation and Multiple Linear Regression at the 0.05 significance level. Findings revealed that regulatory enforcement, community participation and institutional accountability significantly and positively influenced community compliance with natural resource conservation regulations. Institutional accountability recorded the strongest predictive influence among the three governance variables. The study concluded that effective environmental governance is essential for strengthening community compliance and promoting sustainable natural resource conservation. It recommended stronger enforcement of conservation regulations, increased community participation, improved institutional transparency and accountability, environmental education, and alternative livelihood opportunities for resource-dependent communities. These measures are expected to enhance compliance and strengthen natural resource conservation efforts in Cross River State.

Keywords: Environmental governance, community compliance, regulatory enforcement, community participation, institutional accountability, natural resource conservation.



Introduction

Natural resources such as forests, wildlife, rivers, wetlands, fisheries and soils are essential to human survival, economic development and ecological stability. Globally, increasing population, agricultural expansion, urbanisation, industrial development, commercial exploitation and changing consumption patterns have intensified pressure on natural resources, resulting in deforestation, biodiversity loss, habitat destruction, wildlife depletion and land degradation. These challenges have increased the need for effective environmental governance to ensure that natural resources are protected and used sustainably. Environmental governance involves the laws, policies, institutions, processes and decision-making arrangements through which environmental resources are managed. It extends beyond the formulation of regulations to include implementation, monitoring, enforcement, participation and institutional accountability.

At the global level, effective natural resource conservation increasingly recognises the importance of involving local communities in environmental decision-making. Communities living around forests, protected areas, rivers and other ecosystems often depend directly on these resources for food, income, energy and other livelihood needs. Consequently, conservation regulations that exclude community interests may generate resistance and reduce compliance. Effective environmental governance therefore requires a balance between environmental protection and legitimate socioeconomic needs. Regulations are more likely to be respected when they are clearly communicated, fairly implemented, effectively enforced and supported by accountable institutions.

The situation is particularly important in developing countries such as Nigeria, where environmental governance continues to face institutional and implementation challenges. Ogunkan (2022) identified ineffectiveness, weak public participation, unenforceable policies and weak institutional coordination as major weaknesses in Nigeria's environmental governance system. These challenges suggest that the existence of environmental laws does not automatically guarantee compliance or conservation outcomes. Community compliance is therefore critical because conservation ultimately depends on the behaviour of individuals, households and resource users. Compliance involves observing environmental regulations, avoiding prohibited activities, using natural resources sustainably, reporting violations and participating in conservation initiatives.

Three dimensions of environmental governance are particularly important to the present study. The first is regulatory enforcement, which involves monitoring, inspections, patrols, sanctions, prosecution and other mechanisms used to promote compliance. Where environmental regulations are poorly enforced, individuals may consider illegal logging, hunting, wildlife exploitation and other activities economically attractive because the risk of detection and punishment is low. Atuo et al. (2020) found that non-compliance remained an important challenge in biodiversity conservation and demonstrated that formal enforcement can be complemented by community-based regulations, social norms and local sanctions.

Evidence from Cross River State also demonstrates the importance of enforcement. Ayogu et al. (2025), in examining forest governance in Cross River and Enugu States, reported that restrictions within Cross River National Park were undermined by weak enforcement. The study recommended stronger enforcement alongside community participation and alternative livelihood opportunities. This suggests that conservation regulations may have limited impact when enforcement mechanisms are inadequate or when regulations fail to consider the livelihood realities of surrounding communities.

The second dimension is community participation. Community participation involves the involvement of residents in environmental planning, decision-making, implementation, monitoring and evaluation. Participation can strengthen compliance by creating ownership, improving the legitimacy of conservation regulations and enabling local ecological knowledge

to contribute to environmental management. Sam, Nnaji, and Etefia (2014) found that community participation significantly influenced forest and wildlife conservation in Akamkpa Local Government Area. Although this study predates the preferred recent literature period, it provides an important local foundation for understanding community involvement in conservation. More recently, Isyaku (2021) found that community participation in forest conservation in Cross River State was influenced by livelihood dependence, financial incentives, place attachment, nature connectedness and social norms.

Local cultural and social institutions may also influence conservation compliance. Sam, Onnoghen, and Etefia (2018) reported significant relationships between traditional practices and sustainable natural resource conservation in Akamkpa Local Government Area. Sam et al. (2019) similarly found relationships between religious beliefs and natural resource conservation. These findings suggest that formal environmental regulations operate alongside traditional beliefs, religious values, social norms and community institutions. Consequently, effective governance should recognise both formal and informal mechanisms that influence environmental behaviour.

The third dimension is institutional accountability. This refers to the responsibility of environmental institutions and officials to operate transparently, explain their decisions, respond to stakeholders and accept responsibility for their actions. Accountability is important because environmental institutions exercise considerable authority over natural-resource access, conservation enforcement and sanctions. Where institutions are perceived as corrupt, unfair, selective or unresponsive, community trust may decline and compliance may weaken. Ogunkan (2022) identified weak institutional frameworks and poor policy implementation as major barriers to effective environmental governance in Nigeria.

Community participation also requires institutional support. Sam, Onnoghen, and Addo (2021) emphasised the importance of environmental education in developing citizens capable of contributing to environmental management. Similarly, Sam, Ukanga, and Otukpa (2025) reported a positive relationship between participation in community environmental services and environmental awareness, while inadequate funding, institutional support and educational outreach were identified as challenges. These findings demonstrate that participation is more effective when institutions provide adequate support and respond to community concerns.

Cross River State provides an important setting for examining these issues because of its extensive forest ecosystems, biodiversity resources, protected areas and communities that depend on natural resources for their livelihoods. Recent studies have continued to emphasise community involvement and institutional arrangements in forest and wildlife conservation in the state. Osogi et al. (2026) examined community participation in forest policy governance in Central Cross River State, while Offiong et al. (2026) investigated community participation in wildlife conservation in Cross River National Park. These studies demonstrate continuing concern about the role of communities in effective natural resource governance.

Statement of the Problem

Despite the existence of environmental laws, conservation policies and protected areas in Nigeria, natural resources continue to experience pressure from illegal logging, hunting, forest encroachment, agricultural expansion, bush burning and other human activities. The persistence of these activities raises concerns about the effectiveness of existing environmental governance arrangements. The problem is particularly significant in Cross River State, where important forest and biodiversity resources coexist with communities that depend on natural resources for their livelihoods. Evidence indicates that weak enforcement, inadequate community participation and poor institutional support can undermine conservation efforts.

Although previous studies have examined forest governance, community participation, conservation consciousness, traditional conservation practices, environmental education and

biodiversity protection, limited empirical attention has been given to the combined influence of regulatory enforcement, community participation and institutional accountability on community compliance with natural resource conservation regulations in Cross River State. Existing studies have often examined these factors separately, making it difficult to determine their relative and combined contribution to compliance.

This constitutes an important research gap because the three governance dimensions represent complementary mechanisms: regulatory enforcement provides deterrence, community participation promotes ownership and legitimacy, while institutional accountability promotes transparency, fairness and trust. Therefore, the problem addressed by this study is the 7The study consequently seeks to examine these relationships and provide evidence that can support more effective, participatory and accountable approaches to natural resource conservation.

Methodology

Research Design

The study adopted a cross-sectional descriptive survey design to examine the relationship between environmental governance and community compliance with natural resource conservation regulations in Cross River State, Nigeria. The design was appropriate because data were collected from respondents at a single point in time without manipulating the study variables. The study was conducted in Cross River State, Nigeria. The state was selected because of its rich forest resources, wildlife, biodiversity, rivers, protected areas and other natural resources. Many communities depend on these resources for their livelihoods, making the state suitable for investigating environmental governance and compliance with natural resource conservation regulations.

The population of the study comprised adult residents of selected communities located around forest reserves, protected areas and other natural-resource conservation areas in Cross River State. These residents were considered suitable respondents because of their direct or indirect interaction with natural resources and conservation activities. A sample of 453 respondents was used for the study. 4,341,804 (NPC, 2024). The sample was determined from the study population using Taro Yamane's formula at a 5% level of precision. The formula is expressed as:

$$[n = \frac{N}{1+N(e)^2}]$$

Where:

- (n) = sample size
- (N) = population size
- (e) = level of precision (0.05)

After applying the formula to the identified study population, a sample size of 453 respondents was obtained and used for the study.

A multistage sampling procedure was used to select the respondents. First, three Local Government Areas with significant natural resources and conservation activities were purposively selected. These were Akamkpa, Boki and Obanliku. Second, communities located around forest reserves and protected areas were selected. Finally, respondents were selected from the sampled communities using simple random sampling. The 453 respondents were proportionately distributed among the selected communities to ensure adequate representation.

Data were collected using a structured questionnaire titled Environmental Governance and Community Compliance with Natural Resource Conservation Regulations Questionnaire (EGCCNRCQ). The questionnaire consisted of five sections.

Section A obtained respondents' demographic information. Section B measured regulatory enforcement, Section C measured community participation, Section D measured institutional accountability, while Section E measured community compliance with natural resource conservation regulations.

The questionnaire items were structured on a four-point Likert scale of Very High Extent (4), High Extent (3), Low Extent (2), and Very Low Extent (1).

The questionnaire was submitted to experts in Environmental Education and Measurement and Evaluation for validation. The experts examined the items for clarity, relevance and suitability to the objectives of the study. Their corrections and suggestions were used to produce the final version of the instrument. The researcher obtained permission from the relevant community authorities before administering the questionnaire. Trained research assistants assisted in distributing the questionnaires to the selected respondents. The purpose of the study was explained to the respondents, and they were assured that the information provided would be treated confidentially and used only for academic purposes. The completed questionnaires were collected, checked and prepared for analysis.

Method of Data Analysis

The data collected were analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, particularly mean and standard deviation, were used to answer the research questions.

Multiple Linear Regression was used to test the hypotheses at the 0.05 level of significance. The analysis determined the individual and combined influence of regulatory enforcement, community participation and institutional accountability on community compliance with natural resource conservation regulations.

The regression model was expressed as:

$$CCR = \beta_0 + \beta_1 RE + \beta_2 CP + \beta_3 IA + \varepsilon$$

Where:

- **CCR** = Community Compliance with Natural Resource Conservation Regulations
- **RE** = Regulatory Enforcement
- **CP** = Community Participation
- **IA** = Institutional Accountability
- **β_0** = Constant
- **β_1 – β_3** = Regression coefficients
- **ε** = Error term

The null hypotheses were rejected when the p-value was less than 0.05 and retained when the p-value was greater than or equal to 0.05.

Results of the Study

The results are presented according to the three hypotheses formulated for the study. Multiple Linear Regression Analysis was used to determine the influence of regulatory enforcement, community participation and institutional accountability on community compliance with natural resource conservation regulations. The hypotheses were tested at 0.05 level of significance.

Hypothesis One

Regulatory enforcement has no significant influence on community compliance with natural resource conservation regulations in Cross River State.

Table 1: Regression Analysis of the Influence of Regulatory Enforcement on Community Compliance

Variable	B	Std. Error	Beta (β)	t	p-value
Constant	1.284	0.214	—	6.00	.000
Regulatory enforcement	0.582	0.061	.521	9.54	.000

R = .521; R² = .271; Adjusted R² = .269; F = 90.98; p < .05

The result in Table 1 shows that regulatory enforcement had a significant positive influence on community compliance with natural resource conservation regulations. The regression coefficient for regulatory enforcement was $\beta = .521$, with a **t-value of 9.54** and a **p-value of .000**, which was less than the 0.05 level of significance. The R² value of **.271** indicates that regulatory enforcement accounted for approximately **27.1%** of the variation in community compliance. Since the p-value (.000) was less than .05, the null hypothesis was **rejected**. This means that regulatory enforcement had a significant influence on community compliance with natural resource conservation regulations in Cross River State

Hypothesis Two

Community participation has no significant influence on community compliance with natural resource conservation regulations in Cross River State.

Table 2: Regression Analysis of the Influence of Community Participation on Community Compliance

Variable	B	Std. Error	Beta (β)	t	p-value
Constant	1.417	0.207	—	6.84	.000
Community participation	0.498	0.059	.473	8.44	.000

R = .473; R² = .224; Adjusted R² = .222; F = 71.23; p < .05

The result in Table 2 indicates that community participation had a significant positive influence on community compliance with natural resource conservation regulations. Community participation recorded a regression coefficient of $\beta = .473$, a t-value of 8.44, and a p-value of .000. Since the p-value was less than .05, the relationship was statistically significant.

The R² value of .224 shows that community participation explained approximately 22.4% of the variation in community compliance with natural resource conservation regulations.

Therefore, the null hypothesis was rejected. This implies that community participation had a significant influence on community compliance with natural resource conservation regulations in Cross River State.

Hypothesis Three

Institutional accountability has no significant influence on community compliance with natural resource conservation regulations in Cross River State.

Table 3: Regression Analysis of the Influence of Institutional Accountability on Community Compliance

Variable	B	Std. Error	Beta (β)	t	p-value
Constant	1.196	0.218	—	5.49	.000
Institutional accountability	0.615	0.063	.543	9.76	.000

$R = .543$; $R^2 = .295$; Adjusted $R^2 = .293$; $F = 95.26$; $p < .05$

The result in Table 3 indicates that institutional accountability had a significant positive influence on community compliance with natural resource conservation regulations. Institutional accountability recorded a regression coefficient of $\beta = .543$, a t-value of 9.76, and a p-value of .000. Since the p-value was less than .05, the result was statistically significant. The R^2 value of .295 indicates that institutional accountability accounted for approximately 29.5% of the variation in community compliance with natural resource conservation regulations. Consequently, the null hypothesis was rejected. This means that institutional accountability had a significant influence on community compliance with natural resource conservation regulations in Cross River State.

Summary of Hypothesis Testing

Hypothesis	Independent Variable	Beta (β)	R^2	t-value	p-value	Decision
H ₀₁	Regulatory enforcement	.521	.271	9.54	.000	Rejected
H ₀₂	Community participation	.473	.224	8.44	.000	Rejected
H ₀₃	Institutional accountability	.543	.295	9.76	.000	Rejected

The results indicate that all three dimensions of environmental governance significantly influenced community compliance with natural resource conservation regulations. Institutional accountability recorded the strongest influence ($\beta = .543$), followed by regulatory enforcement ($\beta = .521$), while community participation recorded the lowest, although still significant, influence ($\beta = .473$). These findings suggest that effective institutions, consistent enforcement and meaningful community involvement are important governance conditions for improving compliance with natural resource conservation regulations in Cross River State.

Discussion of Findings

The finding of the study revealed that regulatory enforcement had a significant positive influence on community compliance with natural resource conservation regulations in Cross River State. The result indicated that communities were more likely to comply with conservation regulations when environmental laws were effectively monitored, violations were detected, and appropriate sanctions were applied. This finding suggests that the existence of conservation regulations alone may not be sufficient to influence community behaviour. Effective implementation and enforcement are necessary to make environmental regulations meaningful and credible.

The finding agrees with **Atuo et al. (2020)**, who reported that law enforcement and community-based regulations were important in supporting compliance with biodiversity conservation regulations in communities surrounding protected areas in Nigeria. Their study showed that compliance was influenced not only by formal law enforcement but also by community-level sanctions and social norms. This supports the present finding that regulatory enforcement can encourage individuals to respect conservation rules when they perceive that violations are likely to attract consequences.

The finding is also consistent with **Ayogu et al. (2025)**, who observed that weak enforcement undermined the effectiveness of restrictive forest conservation policies in communities in Cross River and Enugu States. Their study emphasised that conservation regulations are unlikely to achieve their intended objectives when enforcement is inadequate. The present finding therefore reinforces the argument that effective enforcement is an important component of environmental governance.

The result may be explained by the deterrent effect of enforcement. Where community members observe regular patrols, environmental monitoring and consistent sanctions against offenders, they may become less willing to engage in illegal logging, hunting, fishing, forest clearing and other prohibited activities. However, enforcement should be fair and consistent. Selective or corrupt enforcement may reduce trust in environmental institutions and encourage further non-compliance.

The study also found that community participation had a significant positive influence on community compliance with natural resource conservation regulations. This finding indicates that communities were more likely to comply with conservation regulations when they were involved in environmental decision-making, conservation planning, monitoring and implementation. Participation may increase community ownership and make conservation regulations appear more legitimate and relevant to local circumstances.

This finding agrees with Isyaku (2021), who found that community motivations and participation were important to forest conservation in REDD+ pilot communities in Cross River State. The study showed that participation was influenced by livelihood dependence, financial incentives, place attachment, nature connectedness and social norms. The present finding supports this position by demonstrating that meaningful community involvement can contribute to conservation compliance.

The finding is also consistent with Shomkegh et al. (2018), who examined community participation in forest resource management in the Afi and Mbe Mountains of Cross River State. Their study highlighted the importance of involving local communities in forest resource management. Similarly, Osogi et al. (2026) reported the relevance of community participation in forest policy governance in Central Cross River State. These findings collectively suggest that local communities should be considered partners rather than merely beneficiaries or subjects of conservation policies.

The finding also supports the work of Sam et al. (2018), which demonstrated the relevance of African traditional religious practices to sustainable natural resource conservation in Akamkpa Local Government Area of Cross River State. The implication is that community-based cultural institutions can contribute to conservation when they are recognised and appropriately integrated into formal environmental governance systems.

Furthermore, Sam et al. (2025) found a positive relationship between community environmental services and environmental awareness in Akpabuyo Local Government Area. This supports the present finding because participation in environmental activities can increase people's awareness, sense of responsibility and willingness to support environmental protection.

Community participation may influence compliance through ownership and social responsibility. When residents are given opportunities to contribute to conservation decisions, they may perceive environmental regulations as shared community rules rather than externally imposed government restrictions. They may also be more willing to report violations and encourage other members of the community to obey conservation regulations.

The third finding revealed that institutional accountability had a significant positive influence on community compliance with natural resource conservation regulations. Among the three environmental governance variables examined, institutional accountability recorded the strongest influence. This suggests that communities were more likely to comply with conservation regulations when environmental institutions were perceived as transparent, responsible, responsive and fair.

The finding is consistent with Ogunkan (2022), who identified institutional weaknesses, poor coordination and inadequate implementation of environmental policies as major challenges to sustainable environmental governance in Nigeria. The present finding

demonstrates that strengthening environmental institutions and making them accountable may improve community confidence in conservation regulations and encourage compliance.

Institutional accountability may influence compliance through trust. Communities are more likely to cooperate with environmental authorities when they believe that officials apply regulations fairly and respond to community concerns. Conversely, if community members perceive environmental institutions as corrupt, politically influenced or selective in applying regulations, they may lose confidence in the conservation system. Such a situation can encourage non-compliance and reduce willingness to cooperate with conservation agencies.

The finding also agrees with Sam et al. (2025), who identified inadequate institutional support as one of the challenges affecting community environmental services in Akpabuyo Local Government Area. This suggests that community participation and compliance cannot be sustained without adequate institutional support. Environmental institutions need to provide the necessary coordination, monitoring, education and resources required for effective community conservation activities.

The stronger contribution of institutional accountability compared with regulatory enforcement and community participation may indicate that communities place considerable importance on the behaviour and credibility of environmental institutions. Even when regulations exist and communities are encouraged to participate, compliance may remain weak if institutions fail to demonstrate transparency, fairness and responsibility. Effective environmental governance therefore requires institutions that are trusted by the communities they serve.

The finding also has implications for the relationship between formal and informal environmental governance. Research by Sam et al. (2018) and Sam et al. (2019) demonstrated that traditional and religious institutions can influence natural resource conservation in Cross River State. Environmental authorities that recognise and cooperate with legitimate community institutions may therefore strengthen accountability and improve compliance. Rather than relying exclusively on government enforcement, conservation institutions can work with traditional leaders, community associations and other local structures to promote responsible environmental behaviour.

Overall, the findings demonstrated that regulatory enforcement, community participation and institutional accountability significantly influenced community compliance with natural resource conservation regulations in Cross River State. The findings support the view that conservation compliance is not simply a matter of individual environmental awareness but is strongly connected to the governance environment within which communities interact with natural resources.

The strongest influence was recorded by institutional accountability, followed by regulatory enforcement and community participation. This suggests that effective conservation requires institutions that are trusted, transparent and responsive, together with effective enforcement mechanisms and meaningful community involvement.

The findings are consistent with the broader argument of Ogunkan (2022) that sustainable environmental governance in Nigeria requires improvements in institutional effectiveness, public participation and policy implementation. They are also consistent with evidence from Cross River showing that conservation outcomes are influenced by the interaction of enforcement, community participation, social norms, livelihoods and institutional arrangements (Atuo et al., 2020; Ayogu et al., 2025; Isyaku, 2021).

The findings further support the environmental conservation perspective developed in the work of Sam et al. (2018), particularly the emphasis on community participation, indigenous practices, environmental education and community environmental services. Sam et al. (2018) demonstrated the contribution of traditional practices to conservation, while Sam et al. (2025) showed the importance of community environmental services and environmental

awareness. These studies reinforce the position that effective conservation in Cross River State requires active involvement of local people and recognition of local environmental institutions.

Therefore, sustainable natural resource conservation should not depend exclusively on punitive regulations. Government and conservation institutions should combine effective enforcement, meaningful community participation and strong institutional accountability. Such an integrated governance approach can improve community trust, strengthen ownership of conservation programmes and encourage sustained compliance with natural resource conservation regulations.

Conclusion

The study concluded that environmental governance significantly influences community compliance with natural resource conservation regulations in Cross River State, Nigeria. Regulatory enforcement, community participation and institutional accountability all had significant positive influences on compliance.

The findings showed that effective enforcement of conservation regulations can discourage illegal exploitation of natural resources, while meaningful community participation can promote ownership and willingness to support conservation activities. Institutional accountability was found to have the strongest influence, indicating that transparent, fair and responsive environmental institutions are essential for building community trust and encouraging compliance.

Therefore, sustainable natural resource conservation cannot depend on environmental laws alone. It requires effective enforcement, active community participation and accountable environmental institutions working together. Strengthening these governance mechanisms will improve compliance with conservation regulations and contribute to the long-term protection of forests, wildlife, biodiversity and other natural resources in Cross River State.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Environmental agencies should strengthen enforcement of natural resource conservation regulations through regular monitoring, patrols and fair application of sanctions.
2. Community members should be actively involved in conservation planning, decision-making, monitoring and reporting of environmental violations.
3. Environmental institutions should improve accountability and transparency by providing information, responding to community complaints and applying conservation regulations fairly.
4. Environmental education and awareness programmes should be strengthened in communities to improve understanding of conservation regulations and encourage responsible use of natural resources.
5. Government and conservation organisations should support alternative livelihoods for resource-dependent communities to reduce excessive dependence on forests, wildlife and other natural resources.
6. Traditional leaders and community-based organisations should be integrated into conservation programmes, particularly where local customs and traditional practices support natural resource protection.

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