

# Adaptive Strategies for Enhancing Sustainable Community Resources for Development in Andoni and Opobo/Nkoro Local Government Areas of Rivers State

**Dr. Hart, Biebele**

Department of Adult Education and Community Development,  
Ignatius Ajuru University of Education, Faculty of Education  
Rumuoleni, Port Harcourt, Rivers State.

[biebele.hart@iaue.edu.ng](mailto:biebele.hart@iaue.edu.ng)  
[hartbiebele89@gmail.com](mailto:hartbiebele89@gmail.com)

## Abstract:

The study examined adaptive strategies for enhancing sustainable community resources for development in Andoni and Opobo/Nkoro Local Government Areas of Rivers State. The population of the study was 699, members and leaders of community based organisations which comprised 594 members and 105 leaders of registered community based organisations in Andoni and Opobo/Nkoro Local Government Areas in Rivers State. The sample size of the study was 406 respondents comprising 301 members and 105 leaders of registered community based organisations in the study areas. Proportionate stratified sampling technique was adopted in selecting 50% of the members from each of the registered community based organisations, while all the 105 leaders were studied without sampling because it was a manageable size. The instrument used for data collection was a structured questionnaire titled “Adaptive Strategies for enhancing sustainable community resources for development Questionnaire” (ASESCRFD). The instrument was validated by two experts in community development. The reliability of the instrument was established through a pilot study using the Cronbach Alpha Method. A cumulative reliability coefficient of 0.78 was obtained. The responses from the four research questions were analysed with mean and standard deviation. The findings from the study revealed among others that conservation and restoration of ecosystems, natural processes, empowering local communities, identifying and evaluating community strengths, leveraging

indigenous knowledge and practices are the types of adaptive strategies used for preserving community resources, the adaptive strategies used for preserving community resources for sustainable community development are effective, and that inadequate financial resources, difficulty in mobilising and engaging communities, absence of local technical capacity and expertise, conflicting practices between traditional and modern conservation approaches, gender roles and cultural norms, climate change impacts such as erosion and flooding, and Weak enforcement of community are the challenges in implementation of adaptive strategies used for enhancing sustainable community resources for Development in Andoni and Opobo/Nkoro Local Government Area. Based on the findings, the study recommended among others that the Rivers State Ministry of Environment and Climate Change Unit, in partnership with the Niger Delta Development Commission, NGOs, and private sector actors, should improve funding access by organising annual proposal-writing workshops for community-based organisations and establishing liaison offices in each LGA. This will enable communities to secure resources from the Nigeria Climate Change Fund, Green Climate Fund, and corporate CSR programmes for adaptation projects.

**Keywords:** Adaptive Strategies, Sustainable Community Resources, Development.

## Introduction

The preservation of community resources is a crucial aspect of sustainable community development, particularly in regions where local ecosystems provide essential services and support livelihoods. Community resources are the assets, services, and infrastructure available within a community, such as natural resources, human skills, social networks, and physical infrastructure. Adelakun [1], community resources refers to the "assets and services within a community that support the well-being and development of its members". In Andoni and Opobo/Nkoro Local Government Areas of Rivers State, Nigeria, community resources such as mangrove forests, fisheries, and water bodies play a vital role in sustaining the livelihoods of local populations. However, these resources face numerous threats, including overexploitation, pollution, and climate change, which undermine their long-term sustainability and the well-being of communities dependent on them. Community resources are "the human, physical, and financial resources available within a community that can be mobilized to address community needs and improve the quality of life of community members." [2].

Adaptive strategies refers to the approaches and practices adopted by communities to respond to changes and challenges in their environment, ensuring the continued availability and sustainability of essential resources. Okafor CC, et al [3] asserted that adaptive strategies are approaches that enable communities to adjust to climate change impacts, particularly in the agriculture and energy sectors and aims to enhance resilience, reduce vulnerability, and promote sustainable development. These strategies are critical in the context of community-based natural resource management, as they enable communities to adapt to evolving conditions, mitigate risks, and capitalize on opportunities. Ravindranath in Aluko et al [4], adaptive strategies are adjustments in response to actual or expected climatic stimuli which moderates harm or exploits beneficial opportunities for the communities. In Andoni and Opobo/Nkoro, the effectiveness of adaptive strategies in preserving community resources is of significant interest, given the areas' rich natural endowments and the communities' reliance on these resources for their livelihoods.

Rivers State, located in the Niger Delta region of Nigeria, is endowed with diverse ecosystems, including mangrove forests, wetlands, and coastal areas, which support a wide range of biodiversity and provide essential services to local communities. Andoni and Opobo/Nkoro Local Government Areas, situated within this region, are characterized by their rich natural resources and the communities' dependence on these resources for agriculture, fishing, and other livelihood activities. Despite their importance, these resources are increasingly threatened by human activities, including oil exploration, pollution, and overexploitation, which necessitates the adoption of adaptive strategies to ensure their preservation.

The importance of adaptive strategies in sustainable community development is underscored by the increasing recognition of community-based approaches to natural resource management. Maria et

al in Hart [5] states that adaptive strategies strives to overcome the limitations of conventional natural resources, science and command-and-control resource management by treating management actions and unplanned environment surprises. These approaches emphasize the role of local communities in managing and preserving their natural resources, leveraging their knowledge, and adopting strategies that are tailored to local contexts. In the context of Andoni and Opobo/Nkoro, understanding the adaptive strategies employed by communities can provide insights into how these approaches contribute to the preservation of community resources and sustainable development.

Previous studies have highlighted the effectiveness of adaptive strategies in various contexts, including climate change mitigation, disaster risk reduction, and natural resource management. For instance, research has shown that communities adopting adaptive management practices are better positioned to respond to environmental changes and uncertainties, thereby enhancing the resilience of their livelihoods and ecosystems. Onyenekwe et al. [6] explored climate change-induced agricultural losses and food security challenges in the Niger Delta region, highlighting adaptation strategies such as livelihood diversification, ecosystem restoration, and dietary management. However, there is a gap in understanding the specific adaptive strategies employed by communities in Andoni and Opobo/Nkoro and their effectiveness in preserving community resources.

This study focuses on Andoni and Opobo/Nkoro Local Government Areas of Rivers State, Nigeria, to examine the adaptive strategies employed by communities for enhancing sustainable community resources and their impact on sustainable community development. The research aims to identify the key community resources, the threats they face, and the adaptive strategies that can be adopted by communities to mitigate these threats and ensure resource sustainability. According to Okeke [7] identified some adaptation strategies which are Ecosystem-based Adaptation (EBA): using natural ecosystems to reduce climate change impacts such as restoring wetlands and forests. Climate-Smart Agriculture: promoting sustainable agricultural practices, like crop diversification and drought-resistant crops. Nature-based solutions (NbSs): integrating natural processes into adaptation strategies, like using sandbags and check dams to control erosion. Community-Led Initiatives: empowering local communities to develop and implement their own adaptation plans. Traditional knowledge: leveraging indigenous knowledge and practices, such as using local minerals to control landslides and gullies. He added that these strategies can build resilience, preserve natural resources and promote sustainable development in Nigerian communities.

By examining these aspects, the study seeks to contribute to the understanding of how adaptive strategies can be leveraged as effective tools for the preservation of community resources for sustainable community development

### **Statement of the problem**

Community resources in Andoni and Opobo/Nkoro Local Government Areas of Rivers State are under increasing pressure from climate-related hazards, resource overexploitation, and weak institutional management. These pressures have contributed to ecosystem degradation, declining fish and crop yields, and loss of livelihoods, reducing the capacity of communities to cope with environmental and economic shocks. Although adaptive strategies such as ecosystem restoration, agroforestry, and community-based resource management are recognized globally as tools for building resilience, evidence on their effectiveness and adoption in these LGAs remains limited. This gap undermines efforts toward sustainable community development and perpetuates cycles of poverty and food insecurity. The study therefore examines the effectiveness of adaptive strategies for preserving community resources and supporting sustainable development in Andoni and Opobo/Nkoro LGAs.

Community resources in Andoni and Opobo/Nkoro Local Government Areas of Rivers State, Nigeria, are facing significant threats from climate change, human activities, and inadequate management, leading to degradation of the resources, loss of livelihoods, and decreased community resilience. Despite the importance of these resources to sustainable community development, there is a dearth of effective adaptive strategies to preserve and manage them, thereby worsening poverty, food insecurity, and vulnerability to climate-related shocks. Thus, this study examines the effectiveness of adaptive strategies for enhancing sustainable community resources, for development

in Andoni and Opobo/Nkoro Local Government Areas of Rivers State.

### **Purpose of the Study**

The purpose of the study was to examine adaptive strategies for enhancing sustainable community resources for development in Andoni and Opobo/Nkoro Local Government Area of Rivers State. Specifically, the study sought to:

1. Identify the adaptive strategies used for enhancing of sustainable community re-sources for development in Andoni and Opobo/Nkoro Local Government Area of Rivers State.
2. Find out how effective the adaptive are the strategies for enhancing for sustainable community resources for development in Andoni and Opobo/Nkoro Local Govern-ment Area of Rivers State.
3. Identify the challenges and barriers to implementing adaptive strategies for enhanc-ing sustainable community resources for development.

### **Research Questions**

The following research questions guided the study.

1. What are the strategies used for enhancing sustainable community resources for development in Andoni and Opobo/Nkoro Local Government Area of Rivers State?
2. How effective are the adaptive strategies used for enhancing sustaina-ble community resources for development in Andoni and Opbo/Nkoro Local Government Area of Rivers State?
3. What are the challenges and barriers to implementation of adaptive strategies for enhancing sustainable community resources for sustainable development?

### **Methodology**

The study was conducted in Andoni and Opobo/Nkoro Local Government Areas of Rivers State. The descriptive research design was adopted for the study. The population of the study was 699, members and leaders of community based organisations which comprised 594 members and 105 leaders of registered community based organisations in Andoni and Opo-bo/Nkoro Local Government Areas in Rivers State (Source: Ministry of Local Government Affairs and Ministry of Youth Development, 2023). The sample size of the study was 406 respondents comprising 301 members and 105 leaders of registered community based organ-isaions in Andoni and Opobo/Nkoro Local Government Areas in Rivers State. Proportionate stratified sampling technique was adopted in selecting 50% of the members from each of the registered community based organisations to arrive at 301, while all the 105 leaders were studied without sampling because it was a manageable size. The instrument designed for da-ta collection was a structured questionnaire titled “Adaptive Strategies for Enhancing Sus-tainable Community Resources for Development Questionnaire” (ASESCRFD). The ques-tionnaire was structured on four (4)-point rating scale of Strongly Agree SA- (4), Agree=A- (3), Disagree–D= (2), Strongly Disagree-SD = (1). The reliability of the instrument was done for each cluster of items in the questionnaire through a pilot study of twenty (20) respond-ents comprising members and leaders of community based organisations in Abua/Odual and Etche Local Government Areas of Rivers State, outside the study population. The instrument was administered once to the group and retrieved for analysis. The data collected were ana-lysed with Cronbach Alpha method on each of the clusters to determine the internal con-sistency of the instrument, and the overall r-value of 0.74 was obtained for the various clus-ters of the instrument. Out of 406 copies of the questionnaire distributed, only 392 copies were retrieved, comprising 99 copies from leaders, and 293 copies from members of com-munity based organisations in the studied areas. From the retrieved copies, 12 copies from members were wrongly filled and discarded while 281 copies from members and 99 copies from leaders were correctly filled and used for the analysis. The data collected from the re-search questions were analysed using Mean and Standard Deviation Statistics. Since the items were rated on four (4) point rating scale. Thus, the decision on each of the items were guided by the following rules; 1-1.49 =Strongly Disagree, 1.5-2.49= Disagree, 2.5-3.49 = Agree, 3.5-4.00= Strongly Agree.

## Results and Discussion

### Results

The result of the study is presented in table 1 as follows.

Research Question 1: What are the types of Adaptive strategies for enhancing sustainable community resources for Development in Andoni and Opobo/Nkoro Local Government Area?

**Table 1: Mean Responses on the Types of Adaptive Strategies for enhancing sustainable Community Resources for Development in Andoni and Opobo/Nkoro Local Government Area. (N = 436)**

S/N	Items	Members, CBOs (240)			Leaders (196)		
		$\bar{X}$	SD	Rmks	$\bar{X}$	SD	Rmks
1	Conserving and restoring ecosystems to reduce vulnerability to climate change.	2.79	0.68	Agree	2.81	0.69	Agree
2	Utilizing natural processes to address environmental challenges, such as reforestation and sustainable agriculture	2.57	0.56	Agree	2.79	0.62	Agree
3	Implementing drought-resistant crops, crop diversification and agroforestry	2.62	0.70	Agree	2.72	0.65	Agree
4	Empowering local communities to manage natural resources sustainably	2.65	0.73	Agree	2.56	0.64	Agree
5	Systematically identifying and evaluating community strengths, such as natural resources, cultural practices, and historical sites	2.68	0.72	Agree	2.62	0.63	Agree
6	leveraging indigenous knowledge and practices, such as using local minerals to control landslides and gullies	2.71	0.80	Agree	2.94	0.74	Agree
7	Integrating natural processes into adaptation strategies, like using sandbags and check dams to control erosion	2.69	0.76	Agree	2.75	0.66	Agree
	Grand Mean	2.67		Agree	2.74		Agree

Source: Researcher's Field Result, 2026.

Table 1 above for research question one, shows the mean response of members and leaders of community based organisations on the types of Adaptive strategies for enhancing sustainable community resources for Development in Andoni and Opobo/Nkoro Local Government Area. Item 1 had mean scores of 2.79 and 2.81, with a standard deviation of 0.68 and 0.69. Item 2 had a mean score of 2.57 and 2.79, with a standard deviation of 0.56 and 0.62. Item 3 had mean scores of 2.62 and 2.79, with a standard deviation of 0.70 and 0.65. Item 4 recorded a mean score of 2.65 and 2.76, with a standard deviation of 0.73 and 0.64. Item 5 had mean scores of 2.68 and 2.70, with standard deviations of 0.72 and 0.63. Item 6, recorded mean scores of 2.71 and 2.94, with standard deviation of 0.80 and 0.74. Item 7 had mean scores of 2.69 and 2.75, with a standard deviation of 0.76 and 0.66 respectively. The grand mean of 2.67 and 2.74 for both groups of respondents was recorded. The results shows that Conservation and restoration of ecosystems, natural processes such as reforestation and sustainable agriculture, drought-resistant crops, crop diversification and agroforestry, Empowering local communities to manage natural resources, identifying and evaluating community strengths, such as natural resources, cultural practices, and historical sites, leveraging indigenous knowledge and practices, using sandbags and check dams to control erosion are the types of adaptive strategies for enhancing sustainable community resources for Development in Andoni and Opobo/Nkoro Local

Government Area.

**Research Question 2:** How effective are the adaptive strategies for enhancing sustainable community resources for Development in Andoni and Opobo/Nkoro Local Government Area?.

**Table 2: Mean Ratings of Members and Leaders on how Effective the Adaptive Strategies For enhancing sustainable Community Resources for Development are in Andoni and Opobo/Nkoro Local Government Area**

(N = 436)

S/N	Items	Members, CBOs (240)			Leaders (196)		
		$\bar{X}$	SD	Rmks	$\bar{X}$	SD	Rmks
8	Community members often participate in restoration of ecosystems activities to conserve or restore local forests, mangroves, and waterways	2.65	0.57	Agree	2.60	0.62	Agree
9	Reforestation and sustainable farming practices are often used to address environmental problems in communities	2.67	0.81	Agree	2.65	0.59	Agree
10	Farmers adopted drought-resistant crops, crop diversification, and agroforestry techniques in the communities	2.61	0.52	Agree	2.74	0.69	Agree
11	Local communities exercise much authority and support to manage natural resources sustainably	2.73	0.64	Agree	2.82	0.63	Agree
12	Local natural resources, cultural practices, and historical sites are usually identified and evaluated for development	2.70	0.60	Agree	2.71	0.57	Agree
13	Indigenous methods, such as using local minerals to control landslides and gullies, are usually applied in the communities	2.60	0.59	Agree	2.90	0.81	Agree
14	natural methods like sandbags and check dams are often used to control erosion and flooding	2.68	0.65	Agree	2.64	0.62	Agree
15	Community members are actively involved in planning and implementing resource preservation strategies.	2.63	0.52	Agree	2.60	0.63	Agree
<b>Grand Mean</b>		<b>3.04</b>		Agree	<b>3.09</b>		Agree

**Source:** Researcher's Field Result, 2026.

Table 2 above for research question two shows the mean responses of members of community based organisations and leaders on how effective the adaptive strategies for enhancing sustainable community resources for Development are in Andoni and Opobo/Nkoro Local Government Area. Item 8 recorded mean scores of 2.65 and 2.60, with standard deviation of 0.57 and 0.62. Item 9 had mean scores of 2.67 and 2.65 with standard deviations of 0.81 and 0.59. Item 10 recorded mean scores of 2.61 and 2.74 with standard deviation of 0.52 and 0.69. Item 11 had mean scores of 2.73 and 2.82, with standard deviations of 0.64 and 0.63. Item 12 recorded mean scores of 2.70 and 2.71 with standard deviations of 0.60 and 0.57. Item 13 had mean scores of 2.60 and 2.90 with standard deviation 0.59 and 0.81, item 14 recorded mean scores of 2.68 and 2.64 with standard deviations of 0.65 and 0.62. While item 15 recorded mean scores of 2.63 and 2.60 with standard deviations of 0.52 and 0.63 respectively. Responses in this research question 2 recorded a grand mean of 3.04 and 3.09 for both group of respondents. The results pointed out that the respondents agreed that the adaptive strategies for enhancing sustainable community resources for Development are effective in Andoni and Opobo/Nkoro Local Government Area.

**Research Question 3:** What are the challenges in implementation of Adaptive strategies for enhancing sustainable community resources for Development in Andoni and Opobo/Nkoro Local Government Area.

**Table 3: Mean Ratings of Members of CBOs and Leaders on the Challenges in Implementation of Adaptive Strategies for enhancing sustainable community Resources for Development in Andoni and Opobo/Nkoro Local Government Area.**

(N = 436)

S/N	Items	Members, CBOs (240)			Leaders (196)		
		$\bar{X}$	SD	Rmks	$\bar{X}$	SD	Rmks
20	The inadequate financial resources hinders the implementation of effective adaptive strategies	2.65	0.64	HE	2.56	0.66	HE
21	Often times there is difficulty in mobilising and engaging communities to implement their initiatives.	2.66	0.52	HE	2.70	0.69	HE
22	The absence of local technical capacity and expertise.	2.68	0.72	HE	2.84	0.52	HE
23	Conflicting practices between Traditional and modern conservation approaches posses a challenge.	2.32	0.21	LE	2.54	0.53	HE
24	The Poor enforcement of environmental regulations hinders effective implementation of adaptive strategies.	2.72	0.66	HE	2.69	0.63	HE
25	The issue of gender roles and cultural norms limits participation of communities in the implementation of effective adaptive strategies.	2.63	0.74	HE	2.67	0.72	HE
26	Climate change impacts such as erosion and flooding make it harder to sustain adaptive strategies.	2.77	0.81	HE	2.63	0.52	HE
27	Weak enforcement of community rules leads to overuse and degradation of natural resources.	2.70	0.66	HE	2.93	0.82	HE
<b>Grand Mean</b>		<b>2.64</b>		<b>HE</b>	<b>2.70</b>		<b>HE</b>

**Source:** Researcher's Field Result, 2026.

Table 3 above shows mean responses of the respondents on the challenges in implementation of Adaptive strategies for enhancing sustainable community resources for Development in Andoni and Opobo/Nkoro Local Government Area. The analysis from table above shows that item 20 had mean scores of 2.65 and 2.56 with standard of 0.64 and 0.66. Item 21 recorded mean scores of 2.66 and 2.70 with standard deviation of 0.52 and 0.69. Item 22 had mean scores of 2.68 and 2.84 with standard deviation, of 0.72 and 0.52. Item 23 recorded mean scores of 2.32 and 2.54 with standard deviation 0. 21 and 0.53. Item 24 had mean scores of 2.72 and 2.69 with standard deviation of 0.66 and 0.63. Item 25 had mean scores of 2.63 and 2.67 and standard deviation of 0.74 and 0.72. Item 26 recorded mean scores of 2.77 and 2.63 with standard deviation of 0.81 and 0.52. Item 27 had mean scores of 2.70 and 2.93 with standard deviation of 0.66 and 0.82 respectively. The grand mean of 2.64 and 2.70 recorded was above the criterion mean, of 2.50 which indicated that inadequate financial resources, difficulty in mobilising and engaging communities, absence of local technical

capacity and expertise, conflicting practices between traditional and modern conservation approaches, gender roles and cultural norms, climate change impacts such as erosion and flooding, and Weak enforcement of community are the challenges in implementation of adaptive strategies for enhancing sustainable community resources for development in Andoni and Opobo/Nkoro Local Government Area.

### **Discussion of Findings**

The findings in research question 1 show that communities in Andoni and Opobo/Nkoro employ a range of adaptive strategies which include ecosystem conservation and restoration, reforestation, sustainable agriculture, drought-resistant crops, agroforestry, empowerment of local communities, identification of community strengths, leveraging indigenous knowledge, and use of natural processes like sandbags and check dams. Both Community Based Organisations members and leaders rated these strategies positively, with grand means of 2.67 and 2.74 respectively, indicating agreement on their use. This aligns with Onyenekwe et al. [8], who found that farming households in the Niger Delta adopt livelihood diversification, crop management, and soil/water management as key adaptation practices. Similarly, Onwubiko and Aheto [9] demonstrated that nature-based solutions such as mangrove reforestation are recognised in Rivers State coastal communities as effective for climate resilience. Okeke [11] also identified ecosystem-based adaptation, climate-smart agriculture, and traditional knowledge as core strategies for building resilience in Nigerian communities. The consistency across studies suggests that communities rely on a mix of modern and indigenous approaches tailored to local ecological and social contexts. This indicates that adaptive strategies in the study area are not imposed externally but are grounded in local practice and environmental realities.

The findings in table 2 revealed that the respondents agreed that the adaptive strategies are effective, with grand means of 3.04 for members and 3.09 for leaders, which implies that strategies such as community participation in ecosystem restoration, reforestation, adoption of drought-resistant crops, and application of indigenous methods were all rated as effective. This finding is supported by Onowu, Albert, and Isife [12], who reported significant income increases among rural families after participating in community-based natural resource management programmes. Onyenekwe et al. [13] also found that adaptation strategies like livelihood diversification and improved fishing gear enhanced resilience among Niger Delta households. The perceived effectiveness is linked to community ownership and local authority over resources. When communities exercise authority and support for sustainable management, as seen in item 11, outcomes improve. This corresponds with Delgado-Serrano et al. [14], who observed that social-ecological systems with longer traditions of community-based management and local buy-in are more resilient to environmental challenges. However, effectiveness is contingent on continuous participation and the integration of traditional and modern practices, as noted in the high ratings for indigenous methods and natural erosion control techniques.

The findings in research question 3 identified inadequate financial resources, difficulty in mobilizing communities, absence of local technical capacity, conflicting traditional and modern conservation practices, poor enforcement of regulations, gender roles, climate change impacts, and weak enforcement of community rules as major challenges. These challenges are consistent with Nzezbule and Obiajunwa [15], who found that policy barriers, lack of economic valuation, and poor strategic leadership hinder the adoption of nature-based solutions in Nigeria. Similarly, Williams noted that organizational challenges, non-stationarity, and geographic scale complicate adaptive management of natural resources. Climate change impacts such as erosion and flooding were rated as high challenges by both groups, which aligns with Onyenekwe et al. who reported that climate shocks undermine food security and livelihoods in the Niger Delta. The conflict between traditional and modern conservation approaches, rated as a challenge by leaders, reflects findings by Williams (2011) on the difficulty of integrating diverse knowledge systems in adaptive decision-making. Addressing these barriers requires coordinated institutional support and capacity building.

## Conclusion and Recommendations

### Conclusion

This study confirms that adaptive strategies such as ecosystem restoration, climate-smart agriculture, indigenous knowledge utilization, and community empowerment are actively used and perceived as effective for preserving community resources in Andoni and Opobo/Nkoro LGAs. The strategies contribute to sustainable livelihoods, climate resilience, and environmental protection when communities are actively involved and supported. However, implementation is constrained by financial limitations, weak technical capacity, regulatory enforcement gaps, and climate-related shocks. Overcoming these challenges requires strengthening institutional frameworks, enhancing community capacity, and fostering inclusive participation that integrates traditional and scientific knowledge.

### Recommendations

The following recommendations were made based on the findings of the study;

1. The Rivers State Ministry of Environment and Climate Change Unit, in partnership with the Niger Delta Development Commission, NGOs, and private sector actors, should improve funding access by organising annual proposal-writing workshops for community-based organisations and establishing liaison offices in each LGA. This will enable communities to secure resources from the Nigeria Climate Change Fund, Green Climate Fund, and corporate CSR programmes for adaptation projects.
2. The Federal Ministry of Environment, Stakeholder Democracy Network, Environmental Rights Action, and Universities should build local technical capacity by conducting quarterly training workshops for CBO leaders, youth, and women on nature-based solutions, climate-smart agriculture, and conflict resolution. A trainers-of-trainers approach should be used to cascade knowledge to villages, strengthening local expertise and sustainable practice adoption.
3. The Traditional Rulers Council, LGA Environmental Health Departments, and the Nigeria Security and Civil Defence Corps Environmental Unit should enhance enforcement by forming joint environmental task forces, developing community by-laws with clear sanctions, and conducting regular patrols and awareness campaigns. Violations should be reported to LGA authorities to ensure accountability and protect community resources.

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