

Indigenous Knowledge Strategies for Promoting Environmental Sustainability in Emohua LGA, Rivers State

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Abstract: *This study examined indigenous knowledge strategies for promoting environmental sustainability in Emohua LGA, Rivers State. The study adopted descriptive survey research design. The population of the study was 2,703 community leaders and members of community-based organizations in Emohua Local Government Area of Rivers State. The sample size of the study was 346 respondents determined by using Krejcie and Morgan table of sample size determination. This comprises 46 community leaders and 300 members of community-based organizations. The sample size was, however, selected using the proportionate stratified sampling technique. The instrument for data collection was a self-designed questionnaire titled “Indigenous Knowledge Strategies For Promoting Environmental Sustainability Questionnaire”. The instrument was subjected to face and content validity by three experts. A test of internal consistency was carried out using the Cronbach Alpha method to determine the reliability of the instrument. Reliability coefficients of 0.72, 0.78 and 0.82, were obtained for the three clusters of the instrument respectively. The research questions were analyzed using mean and standard deviation statistics. The findings of the study revealed among others that community leaders and members of community-based organizations agree that the adoption of sacred forests and biodiversity conservation strategy promote environmental sustainability in Emohua LGA, Rivers State to a high extent. Based on the findings of the study, it was recommended among others that community leaders, environmental agencies, and government bodies should collaborate to legally recognize and protect sacred forests. Policies should be developed to prevent encroachment, deforestation, and illegal activities within these forests.*

Keywords: *Indigenous Knowledge, Environmental Sustainability, Biodiversity*

Introduction

Environmental sustainability has become a global concern due to increasing environmental degradation, deforestation, loss of biodiversity, climate change, and pollution. In developing countries, particularly in Africa, these challenges threaten not only the ecosystem but also the livelihoods and well-being of local communities.

However, indigenous communities have long developed traditional knowledge systems that support environmental conservation and sustainability. These knowledge systems, often referred to as Indigenous Knowledge Systems (IKS) have long supported environmental sustainability through traditional ecological

practices and conservation ethics (An African, 2025).

The indigenous communities in Emohua LGA have developed traditional ecological practices that support environmental sustainability, including soil conservation and sacred forest preservation (Nwankwo, Nuga, & Chukwumati, 2011). Emohua Local Government Area (LGA) in Rivers State, Nigeria, is predominantly inhabited by indigenous people who rely on their natural environment for agriculture, fishing, and other socio-economic activities. Over the years, these communities have developed various indigenous strategies for managing and sustaining their environment. These include traditional land tenure systems, agroforestry practices, sacred forests, seasonal fishing practices, and customary laws that regulate the exploitation of natural resources. Despite the significance of these indigenous strategies, they are often overlooked in mainstream environmental policies, leading to unsustainable development practices that contribute to environmental degradation in the region.

Indigenous knowledge plays a crucial role in environmental conservation by offering locally adapted and time-tested solutions for managing natural resources. The traditional ecological knowledge of the Emohua people includes soil conservation, erosion control, and biodiversity preservation practices that support sustainable resource management (Nwankwo, Nuga, & Chukwumati, 2011). Similarly, indigenous

agricultural techniques such as crop rotation, mixed cropping, and fallowing help maintain soil fertility and reduce dependence on chemical fertilizers.

Furthermore, Traditional governance systems in Emohua LGA, including taboos and community-based monitoring, play a vital role in environmental stewardship, though their influence is waning due to modernization and policy shifts (Onuoha & Okore, 2025). Elders and community leaders play a central role in enforcing these practices, ensuring that resources are used in a way that does not compromise their availability for future generations. However, with the increasing influence of modernization, globalization, and government policies that prioritize industrial approaches to development, indigenous environmental knowledge is gradually being eroded, and its relevance in contemporary sustainability discourse is often undervalued.

Environmental degradation in Emohua LGA, driven by oil pollution, deforestation, and unsustainable land use, continues to threaten local ecosystems and livelihoods (Ahiamadu, Nwaogazie, & Momoh, 2021). The discovery of oil in Rivers State and the activities of multinational oil companies have contributed significantly to environmental degradation in the region. Oil spills, gas flaring, and land degradation have negatively impacted farmlands, forests, and water bodies, threatening traditional livelihoods. Additionally, rapid urbanization, population growth, and

unsustainable land-use practices have intensified pressure on the environment, leading to biodiversity loss and ecosystem instability.

In response to these environmental threats, local communities continue to rely on indigenous knowledge to mitigate environmental degradation. However, these traditional strategies often lack formal recognition by policymakers and environmental agencies. Integrating indigenous environmental knowledge with scientific approaches offers a holistic pathway for sustainable development, yet such knowledge often remains undervalued in formal policy frameworks (Ijatuyi, 2025). Despite the wealth of indigenous environmental knowledge in Emohua LGA, there is limited academic research documenting how these strategies contribute to environmental sustainability. Most environmental policies in Nigeria emphasize Western scientific approaches, neglecting the relevance of indigenous ecological knowledge. This study is therefore significant as it seeks to document, analyze, and promote indigenous knowledge strategies for environmental sustainability in Emohua.

By exploring how local communities manage natural resources through traditional practices, this study will provide insights into how indigenous knowledge can complement modern sustainability efforts. Additionally, the research findings can inform policymakers, environmental agencies, and development organizations on the need to integrate

indigenous knowledge into environmental management policies and programs.

Indigenous knowledge systems offer valuable insights into environmental sustainability, particularly in rural communities where traditional ecological practices have been sustained for generations. In Emohua Local Government Area, indigenous strategies for resource management play a crucial role in promoting environmental conservation, yet they are increasingly threatened by modernization, environmental degradation, and policy neglect. This study aims to bridge the knowledge gap by documenting and analyzing the indigenous knowledge strategies used by Emohua communities to sustain their environment. By doing so, it will contribute to the broader discourse on sustainable development, emphasizing the need for an inclusive approach that integrates indigenous knowledge with modern environmental management practices.

Statement of the Problem

Environmental sustainability is a pressing global concern, with many communities facing challenges such as deforestation, biodiversity loss, soil degradation, and pollution. In Nigeria, particularly in the Niger Delta region where Emohua Local Government Area (LGA) is located, these environmental challenges have been exacerbated by human activities such as oil exploration, deforestation, unsustainable agricultural practices, and poor waste management. Despite numerous government

policies and interventions aimed at promoting environmental sustainability, environmental degradation continues to threaten the livelihoods and well-being of local communities in Emohua LGA.

Indigenous knowledge systems (IKS) have long played a crucial role in environmental conservation by providing sustainable land-use practices, water management strategies, and biodiversity preservation techniques. Communities in Emohua have traditionally relied on sacred forests, seasonal fishing bans, agroforestry, and customary regulations to maintain ecological balance. However, these indigenous strategies are often overlooked in mainstream environmental management policies, leading to their gradual erosion. Furthermore, modernization, urbanization, and the increasing influence of Western scientific approaches have contributed to the declining recognition and application of indigenous knowledge in environmental sustainability efforts.

Despite the potential of indigenous knowledge to offer sustainable solutions, there is a lack of systematic documentation and analysis of these practices in Emohua LGA. The absence of formal recognition of indigenous strategies in environmental policy frameworks has further limited their effectiveness in addressing environmental challenges. As a result, the knowledge and practices that once contributed to sustainable environmental management are being

replaced by unsustainable methods, leading to increased environmental degradation in the region. Indigenous knowledge systems in Emohua LGA offer valuable strategies for environmental sustainability, yet they face challenges from modernization and policy neglect (Ahiamadu, Nwaogazie, & Momoh, 2021; Nwankwo, Nuga, & Chukwumati, 2011). Integrating these practices with scientific approaches can enhance conservation efforts and inform inclusive development policies (Ijatuyi, 2025; Harper, 2025). It will investigate the extent to which these traditional practices are still in use, the challenges they face, and how they can be integrated with modern scientific approaches to enhance environmental conservation efforts. The findings from this study will contribute to the body of knowledge on indigenous environmental management practices and provide recommendations for policymakers on how to incorporate indigenous knowledge into sustainable development strategies in Emohua LGA and beyond.

Purpose of the Study

The purpose of the study was to examine indigenous knowledge strategies for promoting environmental sustainability in Emohua LGA, Rivers State. Specifically, the study sought to achieve the following objectives:

1. determine the extent to which the adoption of sacred forests and biodiversity conservation

strategy promotes environmental sustainability in Emohua LGA, Rivers State.

2. investigate the extent to which the adoption of traditional agroforestry practices promotes environmental sustainability in Emohua LGA, Rivers State.
3. assess the extent to which the adoption of indigenous soil conservation techniques promotes environmental sustainability in Emohua LGA, Rivers State.

Research Questions

The following research questions guided the study:

1. To what extent does the adoption of sacred forests and biodiversity conservation strategy promote environmental sustainability in Emohua LGA, Rivers State?
2. To what extent does the adoption of traditional agroforestry practices promote environmental sustainability in Emohua LGA, Rivers State?
3. To what extent does the adoption of indigenous soil conservation techniques promote environmental sustainability in Emohua LGA, Rivers State?

Methodology

The study adopted descriptive survey research design. The population of the study was 2,703 community leaders and members of community-based organizations in Emohua Local Government Area of Rivers State. This comprised 103 community leaders and 2,600 members of community-based organizations in the study area.

The sample size of the study was 346 respondents determined by using Krejcie and Morgan table of sample size determination. This comprises 46 community leaders and 300 members of community-based organizations. The sample size was, however, selected using the proportionate stratified sampling technique. 10% of the population of members from each CBO was selected to arrive at the sample size. The instrument for data collection was a self-designed questionnaire titled “Indigenous Knowledge Strategies for Promoting Environmental Sustainability Questionnaire”. The instrument was subjected to face and content validity by three experts, one in Measurement and Evaluation and two others in Adult Education and Community Development in Rivers State University. A test of internal consistency was carried out using the Cronbach Alpha method to determine the reliability of the instrument. Reliability coefficients of 0.72, 0.78 and 0.82, were obtained for the three clusters of the instrument respectively. This shows that the instrument is reliable for study. For easy comparison of variables, the data gathered from the questionnaire were analyzed using mean and standard deviation statistics to answer the research questions. Since the items were rated on a modified 4 point Likert scale, the decision rule for the research questions was based on the following rating scale: Very High Extent- 3.50-4.00, High Extent- 2.50-3.49, Low Extent- 1.50-2.49 and Very Low Extent- 1.49 and below.

Results

Research Question 1: To what extent does the adoption of sacred forests and biodiversity conservation strategy promote environmental sustainability in Emohua LGA, Rivers State?

Table 1: Mean Response on the Extent Adoption of Sacred Forests and Biodiversity Conservation Strategy Promotes Environmental Sustainability

S/N	Items	Community Leaders N = 46 Mean	SD	Remark	Members of CBOs N= 300 Mean	SD	Remark
1	To what extent do sacred forests in Emohua LGA contribute to the preservation of plant and animal species?	3.25	0.90	HE	3.22	0.91	HE
2	To what extent do traditional taboos and cultural beliefs associated with sacred forests help in preventing deforestation?	2.55	1.14	HE	3.71	1.53	VHE
3	To what extent does the restriction of human activities in sacred forests reduce soil erosion and land degradation?	3.99	0.89	VHE	3.41	1.00	HE
4	To what extent does the conservation of sacred forests contribute to the regulation of local climate conditions in Emohua LGA?	3.49	0.89	HE	3.45	1.00	HE
5	To what extent do sacred forests help in maintaining the quality and availability of	2.98	1.13	VHE	2.94	1.15	HE

	freshwater sources in the community?						
6	To what extent do local communities in Emohua LGA adhere to the traditional rules and restrictions governing sacred forests?	2.64	1.41	HE	3.66	1.43	VHE
7	To what extent do sacred forests serve as natural carbon sinks, reducing the impact of climate change?	3.11	0.95	HE	3.14	0.97	HE
8	To what extent does the preservation of biodiversity in sacred forests support traditional medicine and indigenous health practices in Emohua LGA?	2.98	1.10	HE	2.93	1.12	VHE
	Grand Mean	3.22		HE	3.34		HE

Source: Field Survey 2025

The data analyzed in Table 1 above for research question one shows the mean responses of community leaders and members of community-based organizations on the extent to which the adoption of sacred forests and biodiversity conservation strategy promote environmental sustainability in Emohua LGA, Rivers State. Respondents agreed that sacred forests in Emohua LGA contribute to the preservation of plant and animal species, traditional taboos and cultural beliefs associated with sacred forests help in preventing deforestation, restriction of human

activities in sacred forests reduce soil erosion and land degradation, conservation of sacred forests contribute to the regulation of local climate conditions and sacred forests help in maintaining the quality and availability of freshwater sources in the community. The grand mean scores of 3.22 and 3.34 for community leaders and members of community-based organizations respectively falls within the decision mean of 2.50-3.49. This indicates that both groups agreed that the adoption of sacred forests and biodiversity conservation strategy promotes environmental sustainability in Emohua LGA, Rivers State to a high extent.

Research Question 2: To what extent does the adoption of traditional agroforestry practices promote environmental sustainability in Emohua LGA, Rivers State?

Table 2: Mean Response on the Extent Adoption of Traditional Agroforestry Practices Promotes Environmental Sustainability

x	Items	Community Leaders N = 46 Mean	SD	Remark	Members of CBOs N= 300 Mean	SD	Remark
9	To what extent does the practice of intercropping trees and crops help in maintaining soil fertility in Emohua LGA?	3.63	0.58	HE	3.57	0.60	VHE
10	To what extent does agroforestry reduce the rate of deforestation and land degradation in the community?	3.22	0.97	HE	3.12	1.00	HE
11	To what extent does the planting of trees alongside crops help in controlling soil erosion and preventing flooding?	3.25	1.22	HE	3.13	1.27	HE
12	To what extent do traditional agroforestry practices contribute to the conservation of biodiversity in Emohua LGA?	3.57	0.69	HE	3.49	0.72	HE
13	To what extent does the use of organic materials (such as leaves and animal waste) in	3.35	0.86	HE	3.27	0.89	HE

	agroforestry improve soil quality and reduce dependence on chemical fertilizers?						
14	To what extent does agroforestry help in mitigating the effects of climate change, such as temperature regulation and carbon sequestration?	3.76	0.54	HE	3.96	0.66	VHE
15	To what extent do indigenous farmers in Emohua LGA still practice traditional agroforestry despite the influence of modern agricultural methods?	3.87	0.55	HE	3.86	0.49	HE
	Grand Mean	3.09		HE	3.42		HE

The analysed data in Table 2 above on research question two shows the mean responses of members of CBOs and community leaders on the extent to which the adoption of traditional agroforestry practices promotes environmental sustainability in Emohua LGA, Rivers State. The table shows that practice of intercropping trees and crops help in maintaining soil fertility, agroforestry reduce the rate of deforestation and land degradation in the community, crops help in controlling soil erosion and preventing flooding, traditional agroforestry practices contribute to the

conservation of biodiversity and the use of organic materials (such as leaves and animal waste) in agroforestry improve soil quality and reduce dependence on chemical fertilizers. The grand mean scores of 3.09 and 3.42 for members of CBOs and community leaders respectively fall within the decision mean of 2.50-3.49. This indicates that both groups agreed that the adoption of traditional agroforestry practices promotes environmental sustainability in Emohua LGA, Rivers State to a high extent.

Research Question 3: To what extent does the adoption of indigenous soil conservation techniques promote environmental sustainability in Emohua LGA, Rivers State?

Table 3: Mean Response on Extent does the Adoption of Indigenous Soil Conservation Techniques Promotes Environmental Sustainability

S/N	Items	Community Leaders N = 46 Mean	SD	Remark	Members of CBOs N= 300 Mean	SD	Remark
16	To what extent does the practice of mulching with organic materials help in improving soil moisture retention and fertility in Emohua LGA?	3.45	1.41	HE	3.38	1.43	HE
17	To what extent does the use of traditional crop rotation methods help in maintaining soil nutrients and reducing soil depletion?	3.22	0.16	HE	2.88	1.06	HE
18	To what extent does the adoption of shifting cultivation prevent soil exhaustion and promote long-term agricultural productivity?	2.77	1.14	HE	2.58	1.12	HE
19	To what extent do indigenous soil conservation techniques, such as the use of cover crops, help in reducing soil erosion in Emohua LGA?	2.72	1.13	HE	2.96	1.03	HE
20	To what extent does the use of compost and animal manure as	2.63	1.15	VHE	2.56	1.12	HE

	natural fertilizers contribute to sustainable soil management in Emohua LGA?						
21	To what extent do local farmers in Emohua LGA practice terracing or contour farming to control soil erosion on sloped farmlands?	2.44	1.16	HE	2.69	1.17	VHE
22	To what extent does the preservation of fallow land for natural regeneration help in restoring soil fertility and improving agricultural yields?	3.35	1.41	HE	3.38	1.43	HE
23	To what extent is the integration of indigenous soil conservation methods with modern farming techniques beneficial for sustainable land use in Emohua LGA?	2.32	0.16	HE	2.88	1.06	HE
	Grand Mean	2.90		HE	2.99		HE

Source: Field Survey, 2025

The analysed data in Table 3 above on research question three shows the mean responses of members of CBOs and community leaders on the extent to which the adoption of indigenous soil conservation techniques promote environmental sustainability. It was revealed that the practice of mulching with organic materials help in improving soil moisture retention and fertility, the use of traditional crop rotation methods help in maintaining soil nutrients and reducing soil

depletion, the adoption of shifting cultivation prevent soil exhaustion and promote long-term agricultural productivity, the adoption of shifting cultivation prevent soil exhaustion and promote long-term agricultural productivity and the use of compost and animal manure as natural fertilizers contribute to sustainable soil management in Emohua LGA. The grand mean scores of 2.90 and 2.99 for members of CBOs and community leaders respectively fall within the decision mean of 2.50-3.49. This indicates that both groups agreed that the

adoption of indigenous soil conservation techniques promote environmental sustainability to a high extent.

Discussion of Findings

The findings of the study for research question one revealed that community leaders and members of community-based organizations agree that the adoption of sacred forests and biodiversity conservation strategy promote environmental sustainability in Emohua LGA, Rivers State to a high extent. Respondents agreed that sacred forests in Emohua LGA contribute to the preservation of plant and animal species, traditional taboos and cultural beliefs associated with sacred forests help in preventing deforestation, restriction of human activities in sacred forests reduce soil erosion and land degradation, conservation of sacred forests contribute to the regulation of local climate conditions and sacred forests help in maintaining the quality and availability of freshwater sources in the community. This finding is in line with the finding of Karki et al. (2023) which revealed that sacred forests serve as critical biodiversity conservation zones by protecting endemic and threatened species, regulating climate, and maintaining ecological balance. Their study in Nepal showed that taboos and cultural beliefs contribute significantly to preventing deforestation and protecting sacred groves.

The findings of the study for research question two revealed that members of CBOs and community leaders agreed that the adoption of traditional

agroforestry practices promotes environmental sustainability in Emohua LGA, Rivers State to a high extent. It was revealed that the practice of intercropping trees and crops help in maintaining soil fertility, agroforestry reduce the rate of deforestation and land degradation in the community, crops help in controlling soil erosion and preventing flooding, traditional agroforestry practices contribute to the conservation of biodiversity and the use of organic materials (such as leaves and animal waste) in agroforestry improve soil quality and reduce dependence on chemical fertilizers. Adams, Modi and Kuria, (2025) emphasize that traditional agroforestry significantly enhances soil fertility and biodiversity. Their study found that intercropping systems in Africa improve carbon sequestration, mitigate climate change, and promote soil conservation. Similarly, Mowa, Yeasmin, Hasan and Ikram (2025) argued that traditional agroforestry systems reduce deforestation rates and enhance environmental stability by incorporating multipurpose tree species, organic materials, and sustainable land-use practices.

The findings of the study for research question three revealed that members of CBOs and community leaders agreed that the adoption of indigenous soil conservation techniques promote environmental sustainability to a high extent. It was revealed that the practice of mulching with organic materials help in improving soil moisture retention and fertility, the use of traditional crop

rotation methods help in maintaining soil nutrients and reducing soil depletion, the adoption of shifting cultivation prevent soil exhaustion and promote long-term agricultural productivity, the adoption of shifting cultivation prevent soil exhaustion and promote long-term agricultural productivity and the use of compost and animal manure as natural fertilizers contribute to sustainable soil management in Emohua LGA. This finding is in line with the finding of Garandi and Bashir (2025) which revealed that indigenous soil conservation methods, such as mulching and composting, significantly improve soil moisture retention and fertility. Their research in Nigeria found that organic mulching increases crop yield and enhances soil structure. Similarly, Saha (2025) found that traditional shifting cultivation techniques prevent soil exhaustion and promote long-term agricultural productivity. His study in India concluded that indigenous land management practices reduce erosion and improve soil fertility.

Conclusion

The study concluded that some indigenous environmental practices in Emohua LGA, Rivers State are sacred forests, traditional agroforestry practices, and indigenous soil conservation techniques. These practices contribute significantly to environmental sustainability by preserving biodiversity, improving soil fertility, reducing deforestation, controlling erosion, and maintaining freshwater sources. Sacred forests play a crucial role in protecting plant and animal

species while preventing deforestation through cultural taboos. Traditional agroforestry practices enhance soil fertility, reduce land degradation, and improve agricultural sustainability through intercropping and organic soil amendments. Similarly, indigenous soil conservation techniques, such as mulching and crop rotation, maintain soil nutrients and promote long-term agricultural productivity. These findings highlight the importance of integrating traditional environmental knowledge with modern conservation strategies to achieve sustainable environmental management. However, for these practices to be more effective, policy interventions, awareness programs, and community participation need to be strengthened.

Recommendations

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

1. Community leaders, environmental agencies, and government bodies should collaborate to legally recognize and protect sacred forests. Policies should be developed to prevent encroachment, deforestation, and illegal activities within these forests. Additionally, community-based conservation programmes should be promoted to ensure that traditional beliefs and taboos continue to play a role in biodiversity preservation.
2. To maximize the environmental benefits of traditional agroforestry practices, the government and non-governmental

organizations (NGOs) should support farmers with incentives, training, and access to native tree species for intercropping. Agroforestry extension programs should be established to educate local farmers on sustainable farming techniques that enhance soil fertility, reduce deforestation, and contribute to climate resilience.

3. Given the effectiveness of indigenous soil conservation techniques, there should be increased awareness campaigns and capacity-building programs to encourage farmers to adopt and maintain these practices. Local agricultural extension services should integrate indigenous knowledge with modern sustainable farming methods to improve soil management, reduce erosion, and promote long-term agricultural productivity.

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