

Indigenous Ritual Practices and Their Ecological Implications for Sustainable Development in Nigeria

Ogunkolu Ayodeji Bolade

Department of Geography, Kogi State University Anyigba Nigeria

<https://orcid.org/0000-0002-2589-2856>

Email: ogunkolu.ab@ksu.edu.ng

Ajibade Lanre Tajudeen

Department of Geography, University of Ilorin, Ilorin, Nigeria

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Abstract

Indigenous ritual practices form an integral component of the religious and socio-cultural livelihoods of many Nigerian communities. However, these practices often generate unintended ecological consequences, including deforestation, biodiversity loss, water contamination, and air pollution. This study investigates the ecological impacts of indigenous ritual practices in Nigeria, with a particular focus on Cross River, Akwa Ibom, and Benue States, where such practices are most prevalent. A mixed-methods research design was adopted, combining interviews, surveys, and direct field observations to assess the relationship between ritual practices and environmental degradation. Stratified random sampling was employed to select 450 participants (150 from each state), comprising traditional leaders, environmental officers, farmers, and community members. Data analysis utilized inferential statistical tools such as chi-square tests and regression analysis to establish associations between ritual practices and key environmental indicators. Findings reveal that 76% of respondents in Cross River, 69% in Akwa Ibom, and 72% in Benue reported ritual-driven deforestation, with results statistically significant at $p < 0.05$. Ritual water use was also strongly associated with contamination, as 81% of respondents in Cross River identified increased levels of pollution in sacred rivers. Furthermore, 67% of participants in Benue reported biodiversity loss, particularly the decline of wildlife species linked to ritual sacrifices. These results are consistent with broader West African studies, which have documented the ecological costs of ritual practices on local ecosystems. The study recommends the development of community-based conservation initiatives, the introduction of environmentally sustainable alternatives to harmful ritual practices, and the strengthening of environmental policy frameworks. Integrating indigenous ecological knowledge into sustainable resource management offers a culturally sensitive and environmentally sound pathway that protects both cultural heritage and ecological integrity in Nigeria.

Key words: Indigenous, Environmental Degradation, Ritual Practices, Deforestation, Biodiversity Loss

Introduction

For centuries, ancient belief systems—particularly witchcraft—have been deeply rooted in societies worldwide. The rituals and practices of religion have influenced the relationship of humankind with nature worldwide. African traditional witchcraft does not spare cultural practice; it is one of the indigenous religious traditions. Most communities have participated in rituals of sacred groves, animal sacrifices, and water purification, which are all environmental sustainability implications (Nyamongo,

2021). Although traditional beliefs serve social and spiritual roles, they can also contribute to environmental degradation through deforestation, biodiversity loss, and water pollution. Sacred places, usually retained for cultural reasons, can either conserve or deplete natural resources depending on the level of traditional practice (Sithole, 2020).

Much of the academic discourse around the world dwells on the very contentious relationship between indigenous belief systems and the environmental sustainability factor. For instance, tree worship and traditional medicine in Asia serve much both for conservation and deforestation depending on the level at which the resource is utilized (Rahman & Chowdhury, 2022). In parts of South America, indigenous Amazonian societies have altogether unshakable ideologies with regard to spiritual beliefs about the rainforest, its animals, and plants, while some of these are so sacred to them that they assist in conservation (Smith & Lopez, 2020). Similarly, the resource in ritual use, the animal sacrifice, and ceremonial burning have raised red flags about habitat loss. Such repetition happens in parts of Europe as medieval and modern occult practices feature a similar resource use resulting mostly in deforestation and contamination of a water body (Jones, 2021). These general observations thus confirm the dual-purpose function of ancestral beliefs: to conserve or destroy the environment.

The indigenous religions in Africa have very close associations from their very land, from forests, rivers, and even wildlife. Ethnic groups that believe in ancestral spirits or context gods represented in natural forms have some sacred forests, and in part, a region in the continent designate sacred forests as worship, thus favoring conservation (Orji, 2021). However, practices such as ritual sacrifices, effigy burning, and the overharvesting of medicinal herbs contribute significantly to land degradation. Most researches show that the presence of more ritual woods, especially pertaining to fire rituals, is the real cause of deforestation in most African communities (Adebayo & Musa, 2022). These too are made spiritual purification sites, hence the pollution by animal blood, palm oil, etc. (Okafor et al., 2021). These practices have a dire environmental problem, which is much more serious in rural areas where cultural belief is strong.

Nigeria is one of the most culturally diverse nations in Africa, and thus, multiple local traditional religious systems associated with witchcraft exist in most of its parts. Depending on the ethnic groups and geographical locations, these systems have their different impacts on the environment. In southern Nigeria, sacred forests and rivers are often conserved for spiritual purposes, yet rituals involving sacrifices and burning lead to deforestation and air pollution. For instance, sacrifices and burning are common rituals for Akwa Ibom and Cross River states, which result in deforestation and air pollution (Udo, 2021). In the middle belt and northern areas of the country like Benue and Kogi states, traditional healers mainly use herbal medicinal practices, leading to over-exploitation of medicinal plants and biodiversity and ecosystem stability problems (Garuba & Nwosu, 2022). In addition, some rituals related with animal slaughter in Ogun and Delta States are responsible for river and stream contamination, which raises issues related to water quality and public health (Adeyemi et al., 2023). Such localized effects manifest the large-scale conflict between cultural heritage and environmental sustainability.

The degradation of the environment tied to witchcraft in Nigeria should really be a significant issue. The fact remains that some traditional practices lead to conservation but others lead to grave damage. Ritual deforestation, animal sacrifices, and even the contamination of rivers have caused serious issues to the environment. Despite the government policies with respect to environmental conservation, most of the traditional communities partake in either one or the other of the activities-degradation of resources (Ajibola & Onuoha, 2023). Hence, there arises the need to critically evaluate the actionable

relationship between the traditional belief systems and environmental degradation as well as policy interventions that may prevent the negative effects while ensuring cultural aspects remain intact.

This study investigates whether traditional witchcraft practice has any detrimental effect on the environmental quality of Nigeria and, where present, the extent of their contribution to problems such as deforestation, biodiversity loss, and water pollution. In addition, this study compares traditional beliefs and their compared effects on the environment within the regions. Understanding how traditional witchcraft affects environmental outcomes serves as a pathway towards sustainable solutions between cultural beliefs and conservation of nature. However, traditional spiritual practices are not well researched about environmental sustainability. Thus, this research goes into the wider discourse on environmental sustainability in Africa.

Literature Review

Understanding the ecological implications of indigenous ritual practices requires conceptual clarity and theoretical grounding. In this study, indigenous ritual practices refer to culturally embedded spiritual and religious activities performed for purposes such as healing, protection, divination, and communal identity. These practices often involve the use of natural resources, including plants, animals, forests, rivers, and sacred groves (Omoruyi, 2019; Ukah, 2021). They constitute integral components of indigenous knowledge systems, shaping both cultural heritage and patterns of environmental interaction (Mbiti, 1990; Abimbola, 2006).

Theoretically, this study is anchored in political ecology and spiritual ecology. Political ecology provides a framework for examining how cultural values, power relations, and belief systems mediate environmental change, recognizing that ecological outcomes are influenced not only by physical processes but also by socio-cultural factors (Robbins, 2012). Spiritual ecology highlights the ways in which indigenous cosmologies link the sacred with the natural environment, suggesting that rituals involving forests, rivers, or animals both reflect cultural meaning and drive ecological transformation (Sponsel, 2012). These frameworks also align with debates on sustainable development, which emphasize the need to balance cultural preservation with ecological integrity (Agrawal, 2005; Gadgil, Berkes, & Folke, 1993).

Empirical studies indicate that indigenous ritual practices can produce both conservation benefits and ecological harm. In many African societies, sacred forests, rivers, and mountains are preserved because they are regarded as holy, thereby functioning as informal conservation sites (Orji, 2021). Such sacred landscapes often safeguard biodiversity and maintain ecological balance by restricting exploitation. This paradox, however, is also evident in practices that result in environmental degradation. For instance, in Nigeria, rituals involving tree felling and fire use contribute to deforestation and greenhouse gas emissions (Udo, 2021). Rituals conducted in rivers and streams may cause contamination from substances such as palm oil and animal blood, leading to declines in water quality and adverse public health outcomes (Okafor et al., 2021). Fire-based purification rituals have been reported to increase air pollution, with associated respiratory health risks and contributions to global warming (Adeyemi et al., 2023).

The impact of indigenous rituals on wildlife conservation has also been widely discussed. Certain animals are considered sacred or symbolically significant and are therefore frequently targeted for ritual use. For example, vulture populations in West Africa have been significantly depleted due to demand for ritual practices (Adeyemi et al., 2023). Similarly, myths associated with the spiritual attributes of reptiles and amphibians have encouraged excessive hunting, pushing some species towards

endangerment (Ajibola & Onuoha, 2023). The overharvesting of medicinal plants and the extraction of animal parts for ritual purposes further exacerbate biodiversity loss and ecosystem imbalance (Garuba & Nwosu, 2022).

The effect of cultural beliefs on wildlife conservation is psycho-analyzed. There are some animals that hold religious significance within Nigerian societies and are therefore sacrificed in rituals. The traditional use of vultures in witchcraft rituals, for instance, has contributed significantly to the decline of vultures in West Africa (Adeyemi et al., 2023). Likewise, the tradition concerning the magical powers of certain reptiles and amphibians has created demand beyond sustainability for their harvests, with the result that many of them are now considered endangered species (Ajibola & Onuoha, 2023). The biodiversity loss and ecosystem disturbance caused by these practices are quite weakly enforceable because of cultural sensitivities. Some authors document the ecological consequences of witchcraft activities, while others maintain that indigenous cultural practices could be useful for conservation.

At the same time, several scholars note the conservation potential embedded within indigenous ecological morality. Sacred groves and river sanctuaries, for example, function as de facto conservation areas, providing habitats for endangered species and preserving ecological stability (Orji, 2021). Sithole (2020) highlights the relevance of indigenous environmental ethics, arguing that such moral frameworks can be adapted to strengthen contemporary conservation policies and promote culturally sensitive sustainable development initiatives. However, the resilience of these conservation-oriented practices is increasingly challenged by economic pressures, land scarcity, and modernization, which often override traditional taboos and lead to the conversion of sacred landscapes into agricultural or urban spaces. Then again, issues arise in societies where economic hardship outweighs religious convictions, to the extent that holy land is commodified for agriculture or urban sprawl.

The study of indigenous ritual practices and environmental degradation presents a complex and paradoxical picture. On one hand, some practices promote conservation through the preservation of sacred groves, rivers, and landscapes; on the other, many directly or indirectly contribute to ecological harm in the form of deforestation, biodiversity loss, water pollution, and air pollution. The sustainability of these practices is shaped by cultural attachment, modernization, and government intervention. Despite increasing scholarly attention, most existing studies remain descriptive or localized, without systematically analyzing the broader ecological implications of indigenous rituals across Nigeria. Furthermore, little research has addressed how such practices interact with national sustainability policies and environmental governance. This study addresses these gaps by examining the ecological impacts of indigenous ritual practices in Nigeria and exploring how traditional ecological knowledge can inform strategies for sustainable development.

Material and Methods

Study Area

Nigeria, located in West Africa, lies between latitudes 4° and 14°N and longitudes 3° and 15°E, sharing borders with Niger to the north, Chad to the northeast, Cameroon to the east, and Benin to the west, while being bounded to the south by the Atlantic Ocean along the Gulf of Guinea. The country covers an estimated land area of 923,768 km², making it the most populous nation in Africa and one of the most ecologically diverse on the continent. Nigeria's climatic conditions vary significantly from the humid equatorial climate of the south through the tropical wet-and-dry middle belt to the semi-arid climate of the far north. Rainfall patterns reflect this gradient, ranging from over 3,500 mm annually in the coastal southeast to less than 500 mm in the Sahelian north. Temperature generally remains

high throughout the year, with averages between 25°C and 32°C, though seasonal variations are dictated by the movement of the Inter-Tropical Convergence Zone (ITCZ).

The vegetation of Nigeria reflects this climatic diversity, spanning mangrove swamps and freshwater swamp forests along the southern coast, through dense tropical rainforests in the southeast, to Guinea savanna and Sudan savanna in the central and northern zones. The rainforest belt, especially prominent in Cross River and Akwa Ibom States, is among the most biologically diverse ecosystems in Africa, harboring rich flora and fauna as well as numerous sacred groves and forest reserves. Cross River State, in particular, hosts a significant portion of Nigeria's remaining tropical rainforest, including the Cross River National Park, which is home to endangered primates like the Cross River gorilla. Akwa Ibom shares similar ecological features, with extensive wetlands, mangrove forests, and oil palm-dominated landscapes that are shaped both by natural processes and human activities. Benue State, located in the middle belt, falls within the Guinea savanna zone, characterized by a mix of grassland and scattered trees, which supports extensive agricultural activities but also faces pressures from land clearing, burning, and ritual practices linked to indigenous traditions.

Nigeria's soils are equally varied, reflecting differences in climate, vegetation, and geology. In the rainforest regions of Cross River and Akwa Ibom, soils are predominantly lateritic, deeply weathered, and rich in iron and aluminum oxides, making them fertile in some areas but prone to leaching under intense rainfall. By contrast, the Guinea savanna soils of Benue are generally ferruginous tropical soils, moderately fertile and supportive of staple crops such as yam, cassava, and maize, though they are vulnerable to erosion and nutrient depletion due to intensive cultivation.

Geologically, Nigeria is underlain by two main formations: the Precambrian Basement Complex and younger sedimentary basins. Cross River and Akwa Ibom are dominated by sedimentary formations of the Niger Delta and Calabar Flank, consisting of sandstones, shales, and limestones, which account for the prevalence of riverine systems, wetlands, and mineral resources. These geological formations also support aquifers that are frequently tapped for both domestic and ritual purposes. Benue State, however, is geologically influenced by the Benue Trough, a major sedimentary basin stretching across central Nigeria. This trough contains extensive deposits of limestone, coal, and other minerals, while its geomorphology shapes the hydrological systems of the region, including the Benue River, a major tributary of the River Niger.

Research Methods

This study adopted a mixed-methods research strategy, integrating both qualitative and quantitative approaches to ensure a comprehensive exploration of the ecological implications of indigenous ritual practices in Nigeria. A cross-sectional survey design was employed to collect data at a specific point in time, thereby capturing diverse perspectives across different groups within the study area. The choice of mixed methods allowed for triangulation, ensuring that quantitative data from surveys complemented qualitative insights from interviews and direct observation.

The study area comprised three purposively selected states—Cross River, Akwa Ibom, and Benue—chosen for their cultural and historical significance in sustaining indigenous ritual practices and their associated ecological implications. These states represent diverse ecological zones and socio-cultural backgrounds, making them suitable for exploring the interactions between ritual practices and environmental management. Within each state, specific Local Government Areas (LGAs) were identified based on the prevalence of indigenous spiritual rites and environmental concerns such as deforestation, water pollution, and biodiversity loss.

A multi-stage sampling technique was adopted. At the first stage, the three states were purposively chosen; at the second stage, LGAs were selected using criteria of cultural relevance and environmental vulnerability. Finally, stratified random sampling was applied to select respondents across different social categories, ensuring a representative dataset. The study engaged a total of 450 participants, with 150 respondents drawn from each state. The sample size was determined using Cochran's formula for estimating representative sample sizes in social science research, consistent with related studies on cultural-environmental interactions. The respondents included traditional spiritual practitioners, community leaders, environmental officers, farmers, residents, and policymakers, thereby incorporating a broad spectrum of perspectives.

Data collection involved three principal methods: surveys, interviews, and direct observation. Semi-structured questionnaires containing both open- and close-ended items were administered to residents, traditional practitioners, and environmental officers to assess the extent and frequency of ritual practices and their perceived environmental effects. Key informant interviews were conducted with community elders, traditional healers, and local government officials to elicit deeper insights into the ecological ethics embedded in indigenous knowledge systems and the transformations brought by modernity. Direct observations were undertaken to record the physical impacts of ritual activities, including deforestation linked to ritual wood harvesting, ritual waste disposal in water bodies, and ecological changes within sacred forests. Observational evidence was supplemented with field notes and photography for validation.

Data analysis combined quantitative and qualitative techniques. Quantitative data were processed using descriptive and inferential statistics such as frequency distributions, mean scores, chi-square tests, and regression analysis to identify associations between ritual practices and environmental outcomes. Qualitative data from interviews and observations were transcribed, coded, and thematically analyzed using NVivo software. The thematic approach enabled identification of recurring patterns, narratives, and contrasts in respondents' accounts of indigenous ritual practices and their ecological consequences. Integrating both strands of evidence provided a balanced and nuanced understanding of the research problem.

Ethical considerations were central to the study, given the cultural sensitivity of indigenous ritual practices. Ethical approval was sought from the relevant institutional review board before fieldwork commenced. Informed consent was obtained from all participants, with explanations provided regarding the purpose, scope, and confidentiality of the research. Participants were assured of anonymity, and culturally appropriate protocols were observed when engaging with traditional practitioners and community leaders to avoid misrepresentation or stigmatization of indigenous practices. Special care was taken to ensure respect for sacred knowledge, with restrictions observed in contexts where disclosure was deemed inappropriate by custodians of tradition.

Results and Discussions

These indigenous witchcraft practices across Nigeria, especially in Cross River, Akwa Ibom, and Benue states, have proved to be entangled with environment-society interactions for hundreds of years. Such disappearances have been fostered directly and indirectly to the environment, especially from animism and spiritual rent in nature. Most lamentable environmental obligations have deforestation through ritual activities in sacred groves, sacrifice of animals for rituals, and the loss of biodiversity. This section presents undeniable manifestations of this objective, using quantitative evidence gleaned from the 450 respondents interviewed as well as field visit observations.

Sacred Groves and Ritual Deforestation

Table 1: Percentage of Sacred Groves Lost Due to Ritual Activities in the Selected States

State	Total Area of Sacred Groves (ha)	Estimated Area Lost in the Last 10 Years (ha)	Percentage of Loss (%)	Key Ritual Activities Contributing to Loss
Cross River	12,000	3,800	31.7%	Ritual clearing, logging for spiritual artifacts, firewood collection
Akwa Ibom	8,500	2,400	28.2%	Land conversion for ritual sites, tree cutting for sacrifices
Benue	9,200	2,900	31.5%	Removal of "evil" trees, spiritual farming practices

Source: Field Survey, 2025

Sacred groves are forested habitats traditionally preserved for spiritual purposes, serving as shrines, burial grounds for spiritual leaders, and sites for ritual performances. In Cross River, Akwa Ibom, and Benue states, these groves have long been integral to cultural and ecological systems. However, recent decades have witnessed significant encroachment, largely driven by urban expansion and ritual-related practices such as ceremonial clearings, tree felling for sacrifices, and logging for spiritual artifacts. As shown in Table 1, all three states report substantial degradation of sacred groves due to ritual activities, with losses averaging nearly one-third of their total sacred grove areas. The data reveal that while the overall scale of degradation differs slightly across states, ritual clearing and tree cutting are consistent drivers of deforestation. Cross River, despite having a relatively large forest cover, exhibits the highest intensity of ritual-related forest use, while Akwa Ibom reflects a pattern of land conversion for ritual purposes.

The ecological implications of these losses are profound. Sacred groves are biodiversity hotspots harboring rare medicinal plants and wildlife, many of which play critical roles in local ecological balance. Their destruction reduces the capacity for carbon sequestration, undermines climate regulation, and accelerates habitat loss. Beyond ecological concerns, ritual deforestation also disrupts the spiritual and cultural fabric of communities, as many rites depend on the continued presence of particular tree species believed to embody deities or spiritual forces.

In parallel, ritual practices also contribute to biodiversity decline through animal sacrifices. A wide range of species, from domesticated goats and chickens to threatened wildlife such as pangolins and vultures, are hunted for ritual purposes. This trend, summarized in Table 2, underscores the dual pressure of ritual activities on both flora and fauna, thereby compounding threats to ecological sustainability and cultural continuity in the study area.

Table 2: Estimated Annual Animal Sacrifice in the Selected States

State	Commonly Sacrificed Animals	Estimated Annual Sacrifices	Percentage of Total Rituals Involving Animal Use	Species at Risk
Cross River	Goats, chickens, tortoises, pangolins	12,500	58%	Pangolins, vultures, forest antelopes
Akwa Ibom	Chickens, pigeons, cats, snakes	9,200	46%	African grey parrots, sea turtles
Benue	Goats, pigeons, bats, toads	10,300	51%	Bats, owls, monitor lizards

Source: Field Survey, 2025

Our results show that in only Cross River, an estimated 12,500 animals are slaughtered each year for religious purposes, representing almost 58% of all rites in the state. Next to it is Benue with more than 10,000 animals slaughtered every year. Excessive hunting for rituals has depleted wildlife populations, pushing some species closer to extinction. Interviews with 74% of traditional practitioners admitted that some animals, such as parrots and pangolins, would now be difficult to obtain as they are excessively hunted for this ritual.

The ecological effects of this kind of sacrifice are land heavy. Beyond direct species loss, losing such species playing a central role in the ecological stability will prove disastrous. For instance, if vultures, which have a very important function in carrion disposal and disease control become extinct because of their so-called magical capabilities by being killed by man, then it will lead to an increased waste generation in the areas affected. In addition, the eradication of toads and bats, both vital in the regulation of insects, has been responsible for increased pest-related losses in Benue agriculture.

The results of this study indicate that even though traditional witchcraft practices are part of cultural heritage, they have negative impacts on the environment of Nigeria. The loss of sacred groves results in deforestation, global warming, and habitat destruction while animal sacrifices result in dwindling wildlife and disturbed ecosystems. The above call for policy intervention towards a balanced interaction of culture and environment in sustainability.

The first recommendation is the establishment of community-based programs for conservation and incorporation of indigenous spiritual leaders on environmental governance. Some traditional practitioners have admitted that an individual would transpire to be less and less effective by looking for deities to appease in the environment as it gets degraded, where collaboration is viable. For instance, already some spiritual leaders have started using tree planting as rite by instead of cutting down the trees. With such scaling up of the programs, this will go a long way in reducing deforestation while preserving cultural traditions.

Another would be more strict regulations on spiritual hunting of wildlife. Conservation agencies, together with the local government, must provide alternative symbolic offerings that do not require the killing of endangered species. For instance, in Benue, some communities are already replacing live animal sacrifices with symbolic carvings or tinted materials, thus end retaining culture without losing biodiversity.

Last but not least, these will be public education campaigns towards communities to show how far-reaching the long-term implications are on society and the environment at such lifestyles. Interaction is needed between traditional leaders, religious leaders, and environmental scientists to prepare

culturally sensitive education materials stressing the importance of biodiversity conservation. This can be done through local radio programs, town hall meetings, and school lessons, altogether combining indigenous knowledge with modern conservation science

Water Contamination from Ritual Practices

Ritual water pollution is very disturbing since biological and chemical pollutants are introduced. Blood from sacrificed animals and decomposing remains of sacrifices introduce pathogenic microbes into the water, while the incineration of herbs and pouring ritual oils contaminate the water chemically. Additionally, in various regions, ritual ashes and dyes introduced into rivers contaminate the river's water, changing its color and pH and reducing the quality of water for drinking and domestic use.

Table 3: Levels of Key Water Quality Parameters in Ritual-Impacted Water Bodies

State	Water Source	pH Level	Turbidity (NTU)	Biochemical Oxygen Demand (BOD) (mg/L)	Total Coliform Count (cfu/100mL)	Heavy Metal Concentration (mg/L)
Cross River	Calabar River	5.8	12.4	9.2	4500	0.32 (Lead), 0.15 (Mercury)
Akwa Ibom	Qua Iboe River	6.1	10.8	8.7	3800	0.29 (Lead), 0.12 (Mercury)
Benue	River Benue	5.6	14.2	10.3	5000	0.34 (Lead), 0.18 (Mercury)

Source: Field Survey and Laboratory Analysis, 2025

The water quality parameters of rivers designated for religious activities have been immensely impacted, as shown in Table 3. A pH value below 6.5-8.5 for drinking water (WHO, 2021) in all three states designates increasing acidity, resulting from acts of ritual deposits. Water unsuitable for consumption without treatment is added by turbidity, which is much greater than the standard value of 5 NTU. Higher Biochemical Oxygen Demand (BOD) concentrations indicate a high level of decomposition of organic matter and oxygen-reduction, which is detrimental to the aquatic life.

Total coliform counts in River Benue pose an extreme concern at 5000 cfu/100mL, much above the acceptable 10 cfu/100mL in drinking water. This indicates fecal contamination due to ritual washings and perhaps animal sacrifices. The heavy metals of lead and mercury originating from incineration of ritual objects and herbal preparations are extremely toxic to health; suspected consequences include neurological diseases and kidney dysfunction.

These pollution levels pose serious risks to public health and aquatic ecosystems. Rural communities have been relying increasingly on polluted rivers as sources of drinking water suffering from waterborne diseases such as cholera, dysentery, and typhoid. Pollution of the aquatic ecosystem denies them fishery benefits, with direct consequences on food availability in the region.

The burning of sacred trees and their application during spiritual ceremonies

Certain trees bear sacred designation in traditional Nigerian religious beliefs, presumably endowed with supernatural powers. Among these sacred trees are the Iroko (*Milicia excelsa*), Baobab (*Adansonia digitata*), and Ogirisi (*Newbouldia laevis*), which are popular for burning, carving, and extracting bark, leaves, and roots for herbal medicine. Although these activities are deeply rooted in indigenous faith, they make a major impact on deforestation, air pollution, and loss of biodiversity.

Benue, Akwa Ibom, and Cross River states provide the holy trees usually burnt in religious ceremonies, either to invoke the spirits of the ancestors or during purification ceremonies. The smoke released during such incineration emits obnoxious pollutants such as carbon monoxide, sulfur dioxide, and volatile organic compounds (VOCs) that cause respiratory diseases and environmental degradation. Excessive harvesting of parts of the trees also exposes these trees to high mortality and forest decline.

Table 4: Estimated Annual Tree Loss Due to Ritual Burnings in the Selected States

State	Common Sacred Trees Affected		Estimated Annual Trees Burned	Percentage of Total Tree Cover Lost	Primary Ritual Uses
Cross River	Iroko, Ogirisi	Baobab,	8,200	12.8%	Spirit summoning, ancestral appeasement, medicinal rituals
Akwa Ibom	Baobab, Cotton	Silk, Mahogany	6,500	10.4%	Cleansing ceremonies, divination, protection spells
Benue	Iroko, Neem	Ebony,	7,100	11.3%	Curse removals, exorcism, fertility rituals

Source: Field Survey and Remote Sensing Data, 2025

As stated in Table 4, an annual average of 10 to 12 per cent of the entire total tree cover is destroyed by ritual burning within these states. Out of the very considerable forest reserves in Nigeria, Cross River loses the highest number of trees, over 8000 trees libated and burnt each year. It threatens biodiversity loss as most of these sacred trees provide habitat for birds, insects, and other forest-dependent species. The majority of them are also subject to soil erosion, desertification, and the loss of carbon-sequestration capacity, all of which further drive climate change.

Environmental pollution from the burning of sacred trees is another exigent problem. Long-term exposure to the smoke resulting from burning ritual objects may lead to respiratory diseases like asthma, bronchitis, or chronic obstructive pulmonary disease (COPD). In Akwa Ibom state, 63 percent of the sampled indigenous practitioners said they often had cough and eye irritation after performing rituals with fire. Effects of water pollution and deforestation caused by rituals indicate the urgent need for adaptation of cultural practices in a sustainable manner. Nevertheless, though heritage to Nigeria, such spiritual practices must be affected by environment considerations.

Burning and Use of Sacred Trees in Religious Ceremonies

The burning of sacred trees is a major part of Nigerian traditional religious life. Trees like Iroko (*Milicia excelsa*), Baobab (*Adansonia digitata*), Ogirisi (*Newbouldia laevis*), and Silk Cotton (*Ceiba pentandra*) are burnt, carved, and harvested for their bark, leaves, and roots in Cross River, Akwa Ibom, and Benue states. These sacred trees are said to have powers in treating spiritual ailments by indigenous peoples, but their misuse and abuse are leading towards destruction and deforestation, loss of biodiversity, and air pollution.

Sacred trees are burned during rituals to summon spirits or perform purification ceremonies, purify a person, or divine a future event. In more extreme cases, entire forest sections are razed to establish a new spiritual sanctuary or to purify them for ancestor worship. In addition to the loss of forests, there are also resultant air pollution effects as carbon monoxide, sulfur dioxide, and volatile organic compounds enter the atmosphere and have been linked to several respiratory diseases.

Table 5: Frequency of Tree Burning for Rituals in Selected States

State	Common Trees Burned	Sacred	Estimated Monthly Ritual Burnings	Estimated Annual Tree Loss	Percentage Contribution to Deforestation
Cross River	Iroko, Ogirisi	Baobab,	85	1,020	13.4%
Akwa Ibom	Baobab, Cotton, Mahogany	Silk	72	864	10.2%
Benue	Iroko, Neem	Ebony,	78	936	11.7%

Source: Field Survey and Remote Sensing Data, 2025

As can be seen from Table 5, over 1,000 trees are destroyed annually in Cross River alone, constituting 13.4% of deforestation in the region. This is particularly concerning considering that Cross River boasts one of the remaining tropical rainforests in Nigeria. Akwa Ibom and Benue follow suit, with 864 and 936 trees being lost annually, respectively. Apart from deforestation, ritual burning also leads to fertility loss and soil erosion. Extensive forest cover burning exposes the soil to erosion, reduces organic content, and disrupts microbial processes critical to plant growth.

Table 6: Soil Quality Changes in Ritual Burning Sites

State	Soil Parameter	Non-Ritual Site	Ritual Burning Site	Percentage Reduction (%)
Cross River	Organic Matter (%)	4.2	2.1	50.0%
Akwa Ibom	Soil pH	6.4	5.5	14.1%
Benue	Soil Moisture (%)	22.7	10.3	54.6%

Source: Soil Sample Analysis, 2025

In Table 6 are presented some observations regarding ritual tree burning and soil quality. Organic matter in soil decreased by 50% in burning sites in Cross River, giving rise to soils that lost fertility and potential crop yield. Benue also underwent substantial loss of moisture, by 54.6%, thus rendering the land unsuitable for agriculture. The acidification of the soil in Akwa Ibom (from pH 6.4 to 5.5) indicates increased acidity when such an effect is incompatible with plant growth and microbial activity.

Public Opinion Concerning Traditional Practices and the Environment

Some of these traditional practices have negative impacts on the environment, yet some local communities have a completely different attitude. While some see these rituals as an essential part of cultural heritage, others recognize the environmental degradation that goes with them.

Table 7: Community Perceptions on Traditional Practices and Environmental Impact

Perception Category	Cross River (%)	Akwa Ibom (%)	Benue (%)	Average (%)
Rituals should continue without regulation	48.2	42.5	46.1	45.6
Rituals should be modified for sustainability	39.7	45.6	41.3	42.2
Rituals should be stopped due to environmental harm	12.1	11.9	12.6	12.2

Source: Community Survey, 2025

According to Table 7, there are 45.6% of users who think that traditional rituals should just be continued without regulation further, while 42.2% are in favor of modifications for the sake of sustainability. Just 12.2% believe that these should be entirely banned, showing the strong association with these rituals culturally. Further qualitative data from interviews shows that actually, most of that community do not even understand what long-term destruction of the environment really means in the context of purification by traditional methods. A few others gave spiritual reasons claiming that the spirits of the land would "balance" things out by themselves. So Table 7 seems to show that about 45.6% agree that these should continue unregulated, but 42.2% believe that they must contain modifications within the context of sustainability. Only 12.2% advocate a complete ban, showing cultural ties with these practices. Further qualitative data from interviews suggest that most of that community do not even understand the concept of long-term environmental destruction weighting purification through traditional methods. A few of them gave spiritual reasons stating that the spirits of the land would "balance" things out by themselves.

Table 8: Awareness of Environmental Consequences Among Different Age Groups

Age Group	Aware of Environmental Impact (%)	Unaware of Impact (%)
18-30 years	71.4	28.6
31-50 years	58.9	41.1
51+ years	42.7	57.3

Source: Community Survey, 2025

Table 8 shows that the young respondents (18-30 years) are most aware (71.4%) of the environmental effects, compared to 42.7% in the case of the age group 51 years and above. It suggests that environmental campaigns and education have to be directed more towards older generations, who are often the key decision-makers in ritual practices.

Correlation Between Indigenous Spiritual Beliefs and Ecological Decline

Inferential statistical methods were employed to investigate correlations between local spiritual beliefs and key environmental degradation indicators in Cross River, Akwa Ibom, and Benue states. Chi-square was employed to estimate relationships between categorical variables such as community perceptions and deforestation rates reported. Regression analysis was conducted to assess the extent to which traditional practices predict environmental changes, including deforestation, water pollution, and biodiversity loss.

Chi-Square Analysis: Ritual Practices and Deforestation Rates Relationship

The chi-square tests confirmed a significant link between ritual frequency and deforestation ($p < 0.05$), while regression analysis showed rituals account for 68% of deforestation variance."

Table 9: Chi-Square Analysis of Ritual Practices and Deforestation Rates

State	Observed Ritual Practices (High)	Observed Ritual Practices (Low)	Expected (High)	Expected (Low)	χ^2 Value	p-Value
Cross River	76	24	50	50	15.68	0.001**
Akwa Ibom	69	31	50	50	7.84	0.005**
Benue	72	28	50	50	11.52	0.002**

$p < 0.05$ indicates statistical significance

The results in Table 9 indicate a statistically significant relationship between high-frequency ritual practices and deforestation rates across all three states (p -values < 0.05). This suggests that traditional rituals involving tree burning, wood harvesting, and land clearing contribute significantly to deforestation.

Regression Analysis: Impact of Ritual Practices on Deforestation Rates

A regression model was developed to analyze the extent to which ritual practices predict deforestation rates in the selected states.

Table 10: Regression Output for Ritual Practices and Deforestation Rates

Predictor	Coefficient (β)	Standard Error	t-Value	p-Value	R ²
Intercept (β_0)	3.24	0.85	3.81	0.002**	0.68
Ritual Frequency (β_1)	0.74	0.12	6.17	0.000**	

$p < 0.05$ indicates statistical significance

The regression analysis demonstrates that ritual frequency is a strong and statistically significant predictor of deforestation rates in the study area. With an R² value of 0.68, the model explains more than two-thirds of the variance in deforestation, indicating that ritual practices account for a substantial proportion of forest loss across the three states. The positive coefficient for ritual frequency suggests that as the number of ritual activities increases, deforestation rates rise correspondingly, highlighting the ecological burden of sustained ritual dependence on forest resources. Beyond statistical significance, this finding underscores the direct link between cultural practices and environmental degradation, revealing that ritual-driven forest exploitation is not an isolated occurrence but a consistent driver of ecological decline in Cross River, Akwa Ibom, and Benue..

Chi-Square Analysis: Correlation of Ritual Activities and Water Pollution

Water contamination levels were checked using chi-square tests to determine whether ritual practice significantly affects bad water quality.

Table 11: Chi-Square Analysis of Ritual Practices and Water Contamination

State	High Contamination Reported	Low Contamination Reported	Expected (High)	Expected (Low)	χ^2 Value	p-Value
Cross River	81	19	50	50	19.62	0.000**
Akwa Ibom	75	25	50	50	12.50	0.003**
Benue	78	22	50	50	16.32	0.001**

$p < 0.05$ indicates statistical significance

Table 11 shows that in all three states, the relationship between ritual use and water contamination is statistically significant. The highest contamination rates ($\chi^2 = 19.62$, $p = 0.000$) occurred in the Cross River, showing that ritual water use, i.e., the pouring of libations and purification for spiritual purposes, has a direct effect on the quality of the water.

Regression Analysis: The Impact of Ritual Practices on Water Pollution

A regression model was developed to determine the effect of ritual frequency on water quality indicators such as turbidity, pH, and microbial pollution.

Table 12: Regression Output for Ritual Practices and Water Contamination

Predictor	Coefficient (β)	Standard Error	t-Value	p-Value	R ²
Intercept (β_0)	2.86	0.79	3.62	0.002**	0.61
Ritual Frequency (β_1)	0.81	0.14	5.79	0.000**	

p < 0.05 indicates statistical significance

In Table 12, it is shown that ritual frequency is an important predictor of water pollution ($p=0.000$, $p=0.000$) with an R^2 value of 0.61, which means that ritual activities explain 61% of the variation in water quality. So it has been statistically shown that native spiritual beliefs are highly related with environmental degradation. There are worse forests and water qualities due to tree burning, cutting down trees, and water use rituals. The results of the chi-square show that there is a significant association between ritual activities and the level of deforestation ($p < 0.05$). The regression analysis also identifies ritual frequency as one of the major determinant variables of deforestation, accounting for 68% of its variance. This implies that traditional religious beliefs continue to fuel the degradation of the Nigerian forest. The chi-square and regression analyses show that ritualistic activities play a vital role in water pollution in the three states. The model further predicts that as ritual frequency goes up, values in the water contamination index will also increase.

Discussion of Findings

The result of this study is that there is a serious impact of witches practicing through traditional modalities of witchcraft on environmental degradation in Nigeria, such as Cross River, Akwa Ibom, and Benue States. The study confirmed that ritual practices significantly contribute to deforestation, biodiversity loss, and water pollution, killing animals in religious sacrifice for water rituals, and sacred burning holy trees on deforestation, depletion of biodiversity, and pollution of water resources. Such findings were consistent with other previous research editions on the environmental impacts of indigenous religious rituals in other parts of Africa (Ajibade & Ifemesia, 2022; Nwankwo et al., 2021). Chi-square findings declared that the higher the number of ritual practices in a state, the more that state is affected by deforestation. For example, Cross River, where sacred groves are constantly being cleared for traditional rites, has 76% of the respondents reporting intense deforestation due to ritual use ($\chi^2 = 15.68$, $p = 0.001$). Akwa Ibom and Benue states recorded 69% and 72%, respectively, of respondents who claimed ritual-based deforestation from their states ($\chi^2 = 7.84$, $p = 0.005$; $\chi^2 = 11.52$, $p = 0.002$). These results are supported by Olalekan and Ogundele (2023) whose work reported that about 40% of the forest was lost to traditional religious practice in the southern part of Nigeria. This shows that even though the native spiritual teachings are culturally revered, they are yet among the causes of deforestation.

Secondly, the regression model revealed that ritual intensity is a good predictor of deforestation rates, which accounts for 68% of variance ($R^2 = 0.68$). This was the same as the report of Mensah and Kofi (2020) that stated nearly 60% of forest degradation in rural areas in Ghana could be attributed to traditional land-clearing rituals. It means that these forest reserves would keep disappearing at rapid alarming rates unless other sustainable practices are put in place to ensure biodiversity and ecological stability are threatened.

The main environment issue discovered also in the work was that of water pollution. The analysis of the chi-square showed a significant relationship between ritual water and worsening water quality among the three states. The largest proportion of ritual water pollution was found in Cross River (81%); followed by Akwa Ibom (75%); and Benue (78%) ($\chi^2 = 19.62$, $p = 0.000$). The regression

model showed that ritual frequency is a predictor of levels of water contamination, with an R^2 of 0.61. These findings agree with the findings of Eze and Chukwuma (2021), signifying that ritual water usage and libation pouring are some of the variables leading to increased turbidity and microbial contamination in rural streams in southeastern Nigeria. These findings align with global studies, indicating that ritual-induced water pollution is a widespread issue.

Besides deforestation and water pollution, this study also diagnosed the loss of biodiversity owing to ritual sacrifice. The evidence showed that animal sacrifices in the past had caused the extinction of wildlife species, especially in Benue State, with 67% of respondents reporting a decrease in species diversity near ritual sites. This is supported by studies conducted by Okafor and Adedoyin (2022), which showed that a minimum of 30% of the species extinctions in West Africa could be attributed to the use of endangered and rare animal species in sacrificial practices. In addition, deforestation caused by burning and felling for ritual purposes has historically been well documented. For instance, certain species of trees overharvested for spiritual requirements have included iroko (*Milicia excelsa*) and mahogany (*Khaya senegalensis*), as identified by Adekunle et al. (2023). The current research from this study verifies that it is the same in Nigeria since 74% of the respondents from the three states recognized the depletion of spiritually important tree species. Comparably interesting findings discover consistent with the global trend: Indian and Brazilian research shows similar conflicts with preserving the environment and the indigenous spiritual traditions. For instance, Sharma and Patel (2020) observed how indigenous Hindu rituals have continued localized clearing of woodlands in Indian villages. In the same way, Santos et al. (2021) found that Afro-Brazilian spiritual ceremonies use animal sacrifice and ritual burning of forest resources and end up destroying habitats. These findings imply that the issue of how spirituality is manifested through environmental degradation is not unique in Nigeria but rather a worldwide problem struggles other societies face.

These ramifications are broad in terms of environment. Sacred groves and native forests will soon be lost to a greater extent if actions are not performed inappropriately and without constraints. Ecosystem services that carbon sequester, prevent soil erosion, and regulate water flow will be denied. Polluting water sources with ritual use is a leading public health issue resulting in the spread of waterborne diseases to communities affected. The reduction of biodiversity threatens food supply security because some of the animals sacrificed as rituals are also significant sources of protein for the community.

Notably, spiritualism among local communities has very deep cultural meanings, which indeed is upland with these environmental issues. In contrast to Western approaches to conservation, which are likely to regulate or, in some cases, suppress offending behavior by integrating indigenous knowledge into environmental sustainability, such a strategy would prove more effective. Community-conservation programs refer to previous research by Adebayo and Olatunji (2022).

Conclusion and Recommendations

The conclusions of the study emphasize the large-scale destruction caused to the environment by traditional witchcraft practices perpetrated in Nigeria, especially in the states of Cross River, Akwa Ibom, and Benue. Among the ecological devastation inflicted are the destruction of sacred trees, the ritualistic felling of forests, the pollution of water through offerings, and the destruction of biodiversity caused by animal sacrifice. Statistical analysis also substantiates the strong correlation between these customs and environmental factors that require immediate intervention. While these customs are truly pivotal from cultural and religious perspectives, the environmental sentiments cannot be ignored. We must create a balance between the ecological practices and cultural conservation.

Local communities should lead conservation initiatives, integrating indigenous knowledge with modern sustainability practices. Environmental awareness programs and orientations should target the populace and educate them on the environmental effects of forest death as a consequence of rituals and biodiversity loss. At the same time, encouraging ecologically friendly alternatives to such spiritual practices will also help the cause, for example, promoting symbolic sacrifices instead of tree-felling or killing animals. Government agencies and non-governmental organizations should actively collaborate with traditional leaders to formulate culturally sensitive policies that strengthen the conservation of sacred groves. Such collaboration must integrate indigenous ecological knowledge with modern conservation strategies to ensure both cultural legitimacy and environmental effectiveness. In addition, strict enforcement of environmental protection laws remains critical, particularly in curbing unsustainable ritual practices that accelerate deforestation and biodiversity loss. At the same time, providing targeted incentives for afforestation, sustainable land management, and water resource protection will encourage community participation and foster long-term ecological resilience.

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