



Understanding Climate Change and Environmental Conservation from the Yoruba Cultural Perspective

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Article Information

<https://doi.org/10.69798/63707925>

ISSN (Online): 3066-3660

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Published by: Koozakar LLC.
Norcross GA 30071, United States.

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Edited by: Oluseye Oludoye PhD 

Abstract

This study examines the public perception of climate change and its impacts within Yoruba communities across eight (8) states in southwestern Nigeria. An online survey, using snowball sampling, was administered to 800 respondents, assessing climate change awareness, environmental challenges, and the role of Yoruba cultural practices towards environmental sustainability. Key climate-related concerns identified by respondents included heat-related illnesses (19.6%), food and water scarcity (18.7%), and agricultural decline (17.9%). Results indicated strong support for the integration of Yoruba culture in environmental conservation, with 56.4% of participants affirming that practices such as taboos and sacred groves promote pro-environmental behavior. Additionally, 70.8% believed Yoruba agricultural practices contributed to sustainable land use. A majority (75.9%) recognized the role of greenhouse gas emissions in environmental degradation, while 82.3% acknowledged the negative effects of land use changes, such as deforestation. Pearson correlation analysis revealed that higher educational attainment was positively correlated with increased climate change awareness. The study also explored climate change's influence on conflict, with 42.4% of respondents noting minimal impact on Fulani herdsman clashes. The findings underscore the potential for integrating cultural practices into climate change mitigation efforts within Yoruba communities.

Keywords: Climate change, Environmental Impacts, Yoruba culture, Perceptions

INTRODUCTION

Climate change is a global issue that poses significant environmental, economic, and social challenges, affecting ecosystems, livelihoods, and economies worldwide (Omoyajowo *et al.*, 2022). It succinctly describes long-term changes in temperature, precipitation patterns, and other atmospheric conditions on Earth, primarily driven by human activities such as burning fossil fuels, deforestation, and industrial processes. These changes lead to significant environmental impacts, including rising global temperatures, more frequent extreme weather events, and shifting ecosystems, which can affect both natural systems and human societies (Omoyajowo *et al.*, 2022; IPCC, 2021).

As variously reported, human activities often release greenhouse gases, including carbon dioxide (CO₂) and methane (CH₄), into the atmosphere, and the effect of this gradually warms the earth, otherwise known as global warming, a significant driver of climate change. In fact, the World Health Organization (WHO) reports that climate change may be responsible for an estimated 250,000 additional deaths annually during the period from 2030 to 2050 (Watts *et al.*, 2015). These fatalities are linked to extreme weather-induced mortality and morbidity, as well as the worldwide spread of vector-borne diseases (Lemery *et al.*, 2021; Yang and Usman, 2021; Meierrieks, 2021; UNEP, 2017). Previous studies identified climate change as one of the drivers of community conflicts, the Fulani Herdsman-Farmers conflict in Nigeria where clashes result to several thousands of deaths of human and livestock (Omoyajowo *et al.*, 2022).

Climate change is a phenomenon that is being experienced across every culture and creeds. The Yoruba people, an ethnic group from southwestern Nigeria, are renowned for their vibrant cultural heritage, which encompasses a rich tapestry of traditions, religious beliefs, and social practices. Yoruba tribe constitute one of the largest ethnic groups in Africa, with significant presence in other countries like Brazil, Cuba, Trinidad and Tobago, Togo, and Benin, even US, Canada, and the UK. Central to their way of life is a profound reverence for nature, reflected in their spiritual practices and folklore, which emphasize the interconnectedness of humans, deities, and the environment. This deep-seated respect for nature is manifest in their rituals, art, and community activities that promote

environmental stewardship. The Yoruba's holistic perspective on nature as a living entity and their practices of sustainable living offer valuable insights into climate change. Their traditional ecological knowledge and harmonious relationship with their surroundings provide a unique lens for understanding how cultural practices can contribute to sustainable environmental management and climate resilience, highlighting the importance of integrating indigenous knowledge into contemporary climate strategies.

Understanding climate change is critical for managing natural resources and developing strategies for adaptation and mitigation. Moreover, studying how cultures adapt to climate change is equally vital. This research endeavor promotes diversity, preserves local knowledge, fosters contextual understanding, ensures equity and social justice, and facilitates the dissemination of successful practices. Such efforts significantly contribute to resilience-building initiatives in the face of climate change impacts. It is important to recognize that cultures are intricately intertwined with specific social, economic, and ecological contexts (Schlosberg, 2013; Omoyajowo *et al.*, 2024a).

Against this backdrop, this study aims to explore Yoruba perspectives on climate change, focusing on how indigenous knowledge systems contribute to environmental sustainability and resilience. Understanding these cultural dimensions is critical for promoting inclusive climate adaptation strategies that respect and incorporate local knowledge systems. The subsequent sections of this paper will follow a structured approach: a comprehensive literature review pertaining to the study's objectives, followed by a detailed description of the materials and methods employed, presentation and discussion of the findings, and finally, the concluding remarks.

LITERATURE REVIEW

Climate change significantly impacts both life activities and environmental resources, with direct effects on plant morphology, physiology, and productivity, as well as indirect effects like soil fertility, pests, and drought (Thornton *et al.*, 2014). Water shortages and temperature extremes disrupt crop growth, reducing productivity and affecting germination rates and root development (Enete,

2014; Eludoyin *et al.*, 2017a, b; Iloh *et al.*, 2014). These impacts vary by region, with water scarcity and seasonal changes in groundwater levels worsening in some areas (Oloruntade *et al.*, 2017; Shiru *et al.*, 2019). Increased rainfall intensity has led to more flooding, affecting both coastal ecosystems and groundwater recharge (Ashaolu, 2015).

Studies have extensively explored the impacts of climate change on the environment, culture, and economic stability. Climate change has been shown to intensify extreme weather events such as floods, droughts, and heatwaves, leading to biodiversity loss, altered ecosystems, and declining agricultural productivity (IPCC, 2014). These environmental changes have cultural implications, as traditional practices and livelihoods, particularly in indigenous and rural communities, are disrupted. For instance, Thornton *et al.* (2014) highlighted that indigenous knowledge systems and agricultural practices are increasingly threatened by changing weather patterns. Economically, the destabilization of agriculture, which is a primary income source in many developing countries, has severe repercussions for food security, income levels, and overall economic stability (Enete, 2014). Additionally, as water scarcity and land degradation increase, conflicts over resources and migration may further strain cultural and economic systems, particularly in vulnerable regions (Eludoyin *et al.*, 2017a, b). These interconnected impacts of climate change call for integrated approaches that consider environmental, cultural, and economic dimensions in adaptation and mitigation strategies.

On the other hand, the Yoruba people are distinguished by their deep environmental consciousness, honoring God's dominion over the Earth and integrating sacred practices into their conservation efforts, such as protecting certain trees and establishing sacred groves. Their cultural traditions, including the reverence for natural features as abodes of spirits and the prohibition of resource exploitation in sacred areas, underscore their commitment to preserving biodiversity and demonstrating an intrinsic respect for nature. The specific resources protected by the Yoruba people include the trees *Adansonia digitata* (baobab), *Bombax buonopozense*, *Newbouldia laevis*, and *Melia excelsa* (Idowu 1973; Ogunade, 2005).

Additionally, the Osun grove in Osogbo is a protected area, where both the forest and the river are off-limits for hunting and fishing (Ogunade 2005). Particularly, plants like *Newbouldia laevis*, which are highly significant in Yoruba culture for the ceremonial installation of 'Oba' (Kings), traditional leaders, and chiefs, are subject to strict protective measures to prevent their endangerment.

Yoruba communities in southwestern Nigeria, traditionally reliant on agriculture due to stable climatic conditions and fertile soils, now face challenges from prolonged climatic events such as heatwaves, droughts, irregular rainfall, and flooding. The northern region's frequent droughts have diminished vegetation and water sources, prompting migrations of Fulani herdsman southward and leading to conflicts over scarce resources, with tragic consequences including massacres (Omoyajowo *et al.*, 2022). In the southern regions, extreme weather events like floods adversely affect crop yields, cause extensive property damage, lead to loss of life, increase pollution, spread vector-borne diseases, displace populations, and disrupt social infrastructure. The intricate relationship between Yoruba culture and their natural environment means that climate change could significantly impact plant species vital for traditional medicine and cultural rituals, with studies indicating that climate change is a major driver of species loss and shifts in species dynamics (Ortiz *et al.*, 2021).

Despite the growing body of research on climate change impacts and cultural responses, there is a notable gap in literature specifically addressing the Yoruba people's perspectives on climate change. While much of the existing research focuses on the environmental effects and adaptation strategies within Yoruba communities, less is known about how climate change is perceived and understood from the Yoruba cultural and spiritual viewpoints. Exploring how traditional beliefs and practices shape the Yoruba's attitudes toward climate change could offer insights into their unique approaches to environmental stewardship and adaptation. Additionally, there is limited research on the integration of traditional ecological knowledge with contemporary climate science in Yoruba communities, which could illuminate how indigenous practices contribute to climate resilience.

MATERIALS AND METHODS

The methodology from Omoyajowo *et al.* (2024a, b) was adapted for this study. Respondents were 18+ years and above, who identified as indigenous Yoruba tribe. An online survey, designed using Google Forms, was distributed to 800 randomly selected households across Yoruba communities in Lagos, Ogun, Ondo, Kwara, Oyo, Osun, Kogi, and Ekiti States, within Nigeria. Nigeria is in West Africa 9.0820° N, 8.6753° E. Although confidentiality was guaranteed to all participants, they were encouraged to provide accurate and honest responses. This study adhered to ethical guidelines for research involving human participants, despite the absence of formal ethical approval. Informed consent was obtained from all respondents, with clear communication regarding the study's purpose, voluntary participation, and the right to withdraw at any time without consequence. The ethical principles outlined in the Helsinki Declaration were strictly followed, ensuring respect for participant autonomy, privacy, and data protection. All responses were anonymized, and no personally identifiable information was collected. Data was securely stored and accessed only by authorized personnel. Given the non-invasive nature of the survey, no risk was posed to respondents.

The survey featured closed-ended questions, including Likert scale and yes/no/not sure formats, and provided an open response section for suggestions. Experts reviewed the questionnaire for validity and two IT consultants evaluated its design and functionality on various devices. Snowball sampling was used, with participants encouraged to share the survey with acquaintances via email and social media. The rationale for using snowball was to address the difficulty of reaching a large, diverse sample within the Yoruba community, especially considering the focus on climate change perception, which may not be widely discussed in public forums. This sampling technique facilitated access to individuals who might otherwise be difficult to reach, enabling the collection of data from a broad spectrum of respondents. However, it acknowledges the potential for sampling bias, as this method may have led to overrepresentation of individuals with more pre-existing knowledge or interest in environmental issues. Data was collated, coded, and quality-checked before statistical analysis was conducted. This study employed both

descriptive and inferential statistical analyses. Descriptive statistics, including mean, frequency, percentages, and standard deviation, were used to summarize the data. Inferential analysis was conducted using Pearson correlation to assess relationships between key variables such as age, gender, education, knowledge, and perception. All statistical analyses were performed using SPSS version 28.

RESULTS

The demographic profile of the respondents is summarized in Table 1. Most participants were between 26 and 35 years old (30.8%) and had a bachelor's degree (49.3%). Females made up 54.6% of the sample, and respondents from Ekiti State accounted for the highest representation (48.1%), while Lagos had the lowest (3.0%). Respondents identified various climate-related challenges. Heat-related illnesses were the most frequently mentioned (19.6%), followed closely by food and water scarcity (18.7%) and agricultural productivity decline (17.9%). Social displacement was a less common concern but still significant at 11.7% (Figure 1). These findings underscore a range of perceived threats related to climate change within Yoruba communities.

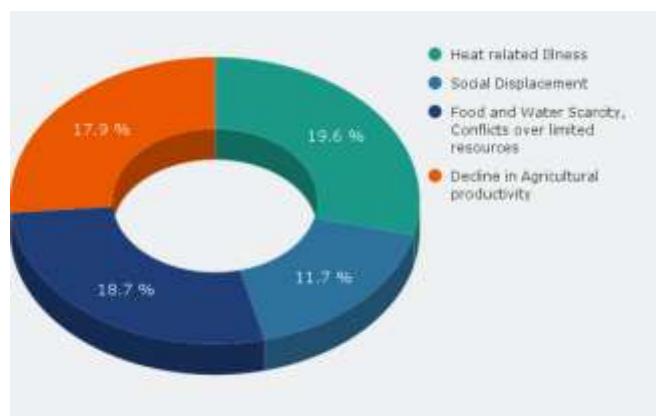


Figure 1: Climate change impacts faced in Yoruba communities.

The study also revealed substantial support for the role of Yoruba culture in environmental conservation. For instance, 56.4% of respondents agreed that Yoruba cultural practices—such as taboos and the protection of sacred groves—encourage environmental stewardship. Further, 70.8% endorsed traditional Yoruba agricultural practices, such as agroforestry, as fostering sustainable land use (Table 2).

Table1: Demographic Information of Respondents

N=800	Subcategories	Frequency	Percentage (%)
i. Age (Years)	18-25	151	18.9
	26-35	246	30.8
	36-45	225	28.1
	46-55	98	12.3
	55-65	50	6.3
	65 Above	30	3.8
ii. Gender	Male	363	45.4
	Female	437	54.6
	Ekiti	385	48.1
iii. State of Origin	Lagos	24	3.0
	Ogun	52	6.5
	Ondo	163	20.4
	Kwara	42	5.3
	Oyo	58	7.3
	Osun	48	6.0
iv. Education Attained	Kogi	28	3.5
	Postgraduate	109	13.6
	Bachelor	394	49.3
	National Diploma/NCE	297	37.1
v. Religion	Christian	634	79.3
	Islam	150	18.8
	Tradition	16	2.0
	No religion	0	0.0

N=number of responses

Table 2: Traditional Yoruba Practice (TYP) Culture and Beliefs that may align with Environmentalism and Relevant to Climate Change Mitigation

		Frequency	Percentages (%)	Mean	Standard Deviation
Teaching Yoruba culture may promote sustainable conservation efforts	Strongly Agree	98	12.3	2.42	.862
	Agree	351	43.9		
	Undecided	284	35.5		
	Disagree	50	6.3		
	Strongly Disagree	17	2.1		
	Strongly Agree	91	11.4	2.32	.779
The quest for environmental protection is keen to the Yoruba culture	Agree	413	51.6		
	Undecided	254	31.8		
	Disagree	31	3.9		
	Strongly Disagree	11	1.4		
	Strongly Agree	149	18.6	2.16	.820
	Agree	425	53.2		
Numerous taboos within the Yoruba culture may reinforce pro-environmental behavior e.g. restrictions on hunting certain animal species during specific seasons	Undecided	184	23.0		
	Disagree	29	3.6		
	Strongly Disagree	12	1.5		
	Strongly Agree	163	20.4	2.12	.811
	Agree	424	53.0		
	Undecided	176	22.0		
Yoruba culture emphasizes the importance of water conservation and protection of water sources	Disagree	27	3.4		
	Strongly Disagree	10	1.3		
	Strongly Agree	119	14.9	2.23	.796
	Agree	434	54.3		
	Undecided	203	25.4		
	Disagree	34	4.3		
Sacred groves in Yoruba communities are biodiversity hotspots and play a vital role in preserving natural habitats	Strongly Disagree	10	1.3		
	Strongly Agree	141	17.6	2.12	.757
	Agree	456	57.0		
	Undecided	171	21.4		
	Disagree	26	3.3		
	Strongly Disagree	6	0.8		
Yoruba agricultural practices, such as agroforestry and mixed cropping emphasizes sustainable land use and soil conservation					

In terms of climate change awareness, most respondents recognized the impact of greenhouse gas emissions (75.9%), deforestation (82.3%), and improper waste management (81.5%) as major contributors to environmental degradation (Table 3). Education was positively correlated with higher

awareness and more informed climate perceptions ($r = .304$ and $r = .311$, respectively), suggesting that increased educational attainment enhances environmental knowledge.

Table 3: Respondents' Knowledge on primary causes of Climate change

		Count	Column N%	Mean	Standard Deviation
Greenhouse gas emissions and deforestation	Strongly Agree	214	26.8		
	Agree	393	49.1		
	Undecided	174	21.8	2.00	.762
	Disagree	19	2.4		
	Strongly disagree	0	0.0		
Industrial processes e.g. cement production, chemical manufacturing and the production of refrigerants and aerosols)	Strongly Agree	209	26.1		
	Agree	452	56.5		
	Undecided	128	16.0	1.93	.696
	Disagree	9	1.1		
	Strongly disagree	2	0.3		
Land use changes, including deforestation and urbanization)	Strongly Agree	186	23.3		
	Agree	472	59.0	1.97	.685
	Undecided	126	15.8		
	Disagree	16	2.0		
	Strongly disagree	0	0.0		
Improper waste, management practices particularly in the decomposition of organic waste in landfills)	Strongly Agree	193	24.1		
	Agree	459	57.4		
	Undecided	137	17.1		
	Disagree	11	1.4		
	Strongly disagree	0	0.0		
Agricultural practices such as rice cultivation and the use of synthetic fertilizers)	Strongly Agree	128	16.0		
	Agree	454	56.8		
	Undecided	195	24.4		
	Disagree	21	2.6		
	Strongly disagree	2	0.3		

The Pearson correlation analysis indicates that age has a small positive correlation with knowledge ($r = .133$, $p < .001$) and perception ($r = .177$, $p < .001$),

suggesting that older individuals may have slightly higher levels of knowledge and different perceptions.

Table 4: Correlation between Respondents' knowledge of climate change against perception and demographic factor (Age, Gender, and Education)

	Age	Gender	Education	Knowledge	Perception
Age	1	-.098 .006	.108 .002	.133" <.001	.177" <.001
Gender	-.098" .006	1 .101" .004	.101" .004	.112" .002	.097" .006
Education	.108" .002	.101" .004	1 .304'	.304' <.001	.311" <.001
Knowledge	.133" <.001	.122" .002	.304" <.001	1 .821"	.821" <.001
Perception	.177" <.001	.097" .006	.311" <.001	.821" <.001	1

Pearson correlation is significant at the 0.01 level (2 tailed), $n=799$

Gender shows a weak negative correlation with knowledge ($r = -.098$, $p = .006$) and a small positive correlation with perception ($r = .097$, $p = .006$), indicating minimal but statistically significant differences in these areas based on gender. Education has a moderate positive correlation with both knowledge ($r = .304$, $p < .001$) and perception ($r = .311$, $p < .001$), highlighting that higher educational attainment is associated with increased knowledge and more informed perceptions.

Interestingly, opinions were mixed regarding climate change's impact on conflicts, particularly regarding clashes with Fulani herdsman. While 42.4% perceived minimal impact, 15.4% considered climate change a significant driver, indicating varied perceptions on this complex issue (Table 5).

Table 5: Influence of Climate Change on Conflicts between Yoruba Communities and Fulani Herdsman

Statements	Frequency	Percentage (%)
Climate change has significantly contributed to conflicts between Yoruba communities and Fulani herdsman	123	15.4
Climate change has had a moderate impact on conflicts between Yoruba communities and Fulani herdsman	150	18.8
Climate change has had a minimal impact on conflicts between Yoruba communities and Fulani herdsman	339	42.4
I do not believe climate change has played a role in conflicts between Yoruba communities and Fulani herdsman	157	19.6
I am not aware of any conflicts between Yoruba communities and Fulani herdsman	31	3.9

DISCUSSION

The findings of this study highlight the Yoruba people's awareness of climate change and underscore the importance of incorporating cultural practices into climate action. Respondents consistently identified heat-related illnesses, food and water scarcity, and agricultural decline as primary concerns, aligning with regional studies indicating that climate change exacerbates these challenges (Xu *et al.*, 2020; FAO, 2018). These results reinforce the vulnerability of communities reliant on agriculture, especially in sub-Saharan Africa, where fluctuating climate conditions can directly impact food security and livelihoods.

A key insight from this study is the significant role that Yoruba cultural practices play in environmental conservation. The high level of agreement (56.4%) on the pro-environmental influence of cultural practices aligns with existing research on indigenous knowledge as a valuable resource for biodiversity conservation (Berkes, 2018). Notably, Yoruba practices such as sacred groves and taboos on hunting certain species reflect deep-seated respect for nature, which may contribute to more sustainable resource use and help mitigate local environmental impacts.

The mixed responses regarding climate change's role in conflicts, particularly with Fulani herdsman, suggest that respondents perceive these conflicts as influenced by factors beyond environmental changes. This echoes studies indicating that such clashes are often driven by ethnic and economic tensions (Abioye *et al.*, 2021). These findings highlight the need for conflict resolution approaches that consider socio-economic and cultural dimensions, alongside environmental stressors.

This study underscores education's importance in climate awareness, with higher educational attainment correlating with greater knowledge and pro-environmental perceptions. These findings support the idea that education is a critical tool for promoting climate literacy and fostering informed decision-making (Owusu & Adjei, 2021).

CONCLUSION

This study provides valuable insights into the Yoruba community's perspectives on climate change and highlights the potential for indigenous knowledge to contribute to environmental sustainability. Respondents consistently identified heat-related illnesses, food and water scarcity, and agricultural productivity decline as primary

climate-related concerns. Additionally, there was strong support for integrating Yoruba cultural practices, such as taboos and sacred groves, into environmental conservation efforts. Most respondents also recognized the impact of industrial processes, deforestation, and waste management on environmental degradation, with education playing a key role in shaping climate awareness.

Policy Recommendations

- i. Integrate Yoruba Cultural Practices into Environmental Policies: Encourage the inclusion of Yoruba cultural values in environmental education and climate action plans to support community-based conservation.
- ii. Develop Targeted Adaptation Strategies: Address specific vulnerabilities in Yoruba communities, including strategies to mitigate heat-related illnesses and food/water scarcity.
- iii. Enhance Climate Education: Implement awareness campaigns, especially targeting younger and less educated populations, to improve understanding of climate change causes and consequences. Considering the mixed perceptions regarding climate change's impact on conflicts, especially with Fulani herdsmen, further research is needed to address potential climate-related conflict drivers and develop strategies for conflict resolution.
- iv. Promote Sustainable Land Use and Waste Management: Establish policies that incentivize sustainable agricultural practices and efficient waste management to reduce environmental degradation.
- v. Conduct Further Research on Conflict Drivers: Given the varied responses regarding the impact of climate change on conflicts, further studies should explore potential climate-related and socio-economic conflict drivers to inform resolution strategies.

These findings emphasize the need for culturally informed climate policies that respect and incorporate indigenous knowledge systems to foster resilience in vulnerable communities.

Acknowledgment(s)

Author would like to thank Ms. Damilola Oni for her assistance with data entry and cleaning, as well as all participants who contributed to the online survey.

Author Contributions

The author conceived the idea, design the methodology, performed the data analysis.

Data Availability Statement

The data used in this study can be provided by the corresponding author upon reasonable request.

Funding Statement

No funding was received for this study.

Conflict of Interest

The author declare that there are no conflicts of interest regarding the publication of this manuscript.

Ethical Statement

Although formal ethical approval was not obtained for this study, it adhered to the ethical principles outlined in the Helsinki Declaration.

Supplementary Data

Not applicable.

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