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Public Perception and Adaptation to Climate Change in Moro Local Government, Kwara State, Nigeria

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ABSTRACT: The objective of this paper was to evaluate the public perception and adaptation to climate change in Moro Local Government, Kwara State, Nigeria. A total of 60 questionnaires were administered across five settlements. Findings revealed that 45% of respondents had heard about climate change, though awareness levels varied, with Igbo Oreku showing the highest awareness (11.7%) and Okete the lowest (3.3%). About 90% of respondents acknowledged changes in rainfall patterns and temperature, which significantly had impact on their agricultural operations. Majority (75%) noted that the dry season had lengthened, and 78.3% observed a shift in planting times due to reduced rainfall. While only 40% acknowledged contributing to climate change through deforestation, 46.7% were willing to adopt adaptation strategies like reducing wood burning and participating in environmental campaigns. The study concludes that climate change adaptation must address local socioeconomic realities and be supported by targeted policies. Recommendations include increasing public awareness through local government-led education programs, promoting sustainable practices, and enhancing collaboration between local authorities, NGOs and communities.

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Climate change refers to observable variations in the climate system, largely driven by human activities that alter the atmospheric composition of the earth and contribute to global warming. Global warming is intrinsically linked to climate change, particularly through the imbalance in natural and man-made greenhouse gases (GHGs), which have been globally identified as the main cause of the warming of the atmosphere and oceans (Sivaramanan, 2015). It is regarded as one of the most critical environmental challenges facing the global population (Kasperson *et al*., 2022), though debates surrounding the issue are longstanding and have expanded beyond the scientific community to international political and diplomatic arenas (Capstick *et al*., 2015; Gao *et al*., 2017). The World Health Organization (WHO) highlighted the growing threat of climate change to global public health by selecting "protecting health from climate change" as the theme for World Health Day a few years ago. Climate change poses increasing risks to public health, with impacts visible both in the short and long term (Asekun-Olarinmoye *et al*., 2014). These impacts include an anticipated rise in airborne pollutants leading to respiratory

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problems, an increase in mosquito-borne diseases like malaria and dengue, and heightened risks of gastrointestinal infections due to rising temperatures (Linares *et al*., 2020, Mirsaeidi *et al*., 2016). Vulnerable groups, such as children and the elderly, are particularly at risk from these climate-related health issues (Bayram *et al*., 2023). Understanding public perceptions of climate change is crucial to fostering successful adaptation and mitigation efforts (Kabisch *et al*., 2016). In developed countries, such as the United States, the population have varied beliefs about whether climate change is real, the causes and how it will personally affect them (Leiserowitz *et al*., 2013). This perception gap can hinder public engagement in climate change action. Research has shown that individuals risk perceptions, often shaped by direct experiences with climate-related events like flooding, influence their support for collective solutions (Dhar *et al*., 2023). Risk perception is also key to collective action on environmental issues, including climate change (Arbuckle *et al*., 2015). While risk perceptions predict support for climate-related policies and behaviours, they are not sufficient on their own to drive significant action (Sousa-Silva *et al*., 2018). Social identity, reliance on natural resources, and perceived norms around participation are additional factors that influence climate change responses (Bamberg *et al*., 2015). Previous research has shown that public awareness of climate change issues varies, with many people lacking a comprehensive understanding of its causes and consequences (Arbuckle *et al*., 2015; Capstick *et al*., 2015; Roser-Renouf *et al*., 2015). Misconceptions about greenhouse gas emissions, for example, can lead to misguided support for ineffective policies, such as focusing on traditional pollution controls rather than targeting the reduction of GHG emissions (Prinn *et al*., 2005). For developing nations like Nigeria, climate change is a serious environmental challenge that must be addressed urgently. Given the substantial evidence of climate change effects, it is critical to assess public perceptions and knowledge to tailor appropriate awareness and adaptation strategies. However, there is a lack of enough studies examining public perceptions of climate change in the Nigerian context. Understanding these perceptions is essential for guiding awareness campaigns and policy decisions that can mitigate the impacts of climate change in the country. This study seeks to bridge this gap by assessing public perceptions of climate change in Moro Local Government Area of Kwara State, Nigeria, providing insights into the level of awareness and understanding of climate change impacts and adaptation strategies. The findings from this study will help determine the current level of climate change awareness in Nigeria and identify areas where further education is needed. Hence, the objective of this paper is to evaluate the public perception and adaptation to climate change in Moro Local Government, Kwara State, Nigeria.

MATERIALS AND METHODS

Study Area: Moro Local Government Area (LGA) is located in Kwara State, Nigeria, with its administrative headquarters in Bode-Saadu. This LGA encompasses several districts, including Moro, Alara, Ajanaku, Arobadi, Babadubu, and Bode-Saadu, with a total area of about 3,272 square kilometers and home of diverse ethnic groups, including Yoruba, Nupe, Fulani, and Hausa. The residents are primarily farmers due to the vast expanse of arable and fertile soil. The main food crops cultivated in the region include cassava, yam, maize, guinea corn, okra, groundnut, pepper, and various vegetables. Additionally, livestock rearing, such as sheep, goats, cattle, and poultry are made possible by the suitable vegetation of the region. Moro LGA experiences an average temperature of 29°C and has two distinct seasons: dry and rainy. The average wind speed is 11 km/h.

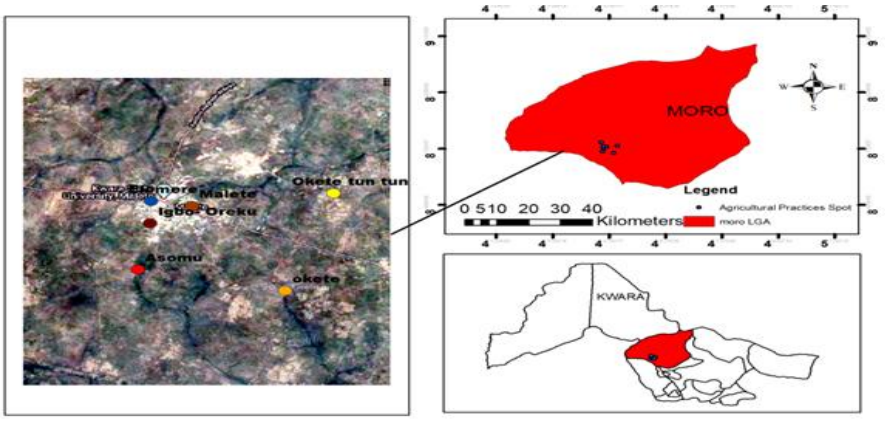

Fig. 1: Map of the study area

Methods of Data Collection: The study utilized primary data collected through questionnaires administered in selected towns within Moro LGA, specifically Malete, Akorede, Elemere, Asomu, Okete, and Igbo Oreku. A sample size of ten respondents was targeted in each village to assess perceptions of climate change. The collected data was presented using frequency distribution tables.

RESULTS AND DISCUSSION

Awareness of climate change: The results showed that approximately 45% of respondents were aware of climate change (Table 1), with Igbo Oreku having the highest awareness rate at 11.7%. Asomu and Malete each accounted for 8.3%, while the awareness level in Akorede and Elemere was only 6.7%. Okete had the lowest awareness rate, with only 3.3% being aware of climate change. Further analysis revealed that 53.3% of the respondents had not heard about climate change, with Okete and Akorede having the greatest frequencies of unawareness at 13.3% and 10%, respectively.

Perception of climate change effects: A large percentage of those who participated (75%) said that the climate was getting drier every year, and 90% thought that the rainfall pattern had changed in the past ten years. While 78.3% of respondents pointed out that planting times have changed, causing discomfort and decreased agricultural productivity, the majority of respondents (75%) voiced concerns about rising temperatures over the past few decades.

Table 1: Awareness of climate change among residents in selected towns in Moro LGA

Questions	Response	Survey Towns						Total	Percentage
		Igbo Oreku	Asomu	Okete	Akorede	Elemere	Malete		
Ever heard of climate change?	Yes	7	5	2	4	4	5	27	45.0%
	No	3	5	8	6	5	5	32	53.3%
	Unanswered	0	0	0	0	1	0	1	1.7%
Do you think the pattern of rainfall has changed?	Yes	9	10	10	8	8	9	54	90.0%
	No	1	0	0	2	1	1	5	8.3%
	Unanswered	0	0	0	0	1	0	1	1.7%
Do you think length of dry season has changed?	Yes	8	9	8	6	7	7	45	75.0%
	No	2	1	2	4	3	3	15	25.0%
	Unanswered	0	0	0	0	0	0	0	0.0%
Do you think the time of planting has changed?	Yes	8	8	6	8	8	9	47	78.3%
	No	2	2	3	2	2	1	12	20.0%
	Unanswered	0	0	1	0	0	0	1	1.7%

Contribution to climate change: Forty percent of respondents acknowledged that their activities, such as deforestation and reliance on environmental resources, contributed to climate change (Table 2). These practices were cited as affecting the livelihoods of the local population. Half of the respondents (50%) believed that cities and larger towns should bear the blame for climate change, while 38.3% attributed climate changes to individual actions.

Table 2: Perception of contributors of climate change among respondents

Questions	Response	Survey Towns						Total	Percentage
		Igbo Oreku	Asomu	Okete	Akorede	Elemere	Malete		
Do you think you contribute to climate change?	Yes	2	2	4	4	7	5	24	40.0%
	No	8	8	6	6	3	5	36	60.0%
	Unanswered	0	0	0	0	0	0	0	0.0%
Do you think cities and towns should be blamed?	Yes	4	4	5	5	5	7	30	50.0%
	No	4	5	5	3	4	2	23	38.3%
	Unanswered	2	1	0	2	1	1	7	11.7%
Is it too late to do anything about climate change?	Yes	5	4	3	5	4	7	28	46.7%
	No	5	6	6	5	5	3	30	50.0%
	Unanswered	0	0	1	0	1	0	2	3.3%

Adaptation strategies to climate change: When asked to rank the adaptation strategies they will like adopt or participate in, 23.3% of respondents expressed a willingness to participate in environmental campaigns and indicated they would stop burning wood, while 1.7% planned to reduce fossil fuel use by walking more or begin recycling of items. Another 31.7% of respondents mentioned they would listen to radio programs to gain a better understanding of planting seasons while only 6.7% would consider the

use of organic manure. Despite these responses, half of the respondents (50%) felt that nothing could be done to control climate problems, while 46.7% expressed a willingness to take action individually, while 11.7% do not know of any plan or strategy that could help reduce or adapt to climate change.

Table 3: Perception on strategies that could help reduce or adapt to climate change

Adaptation plan options	Survey Towns						Total	Percentage
	Igbo Oreku	Asomu	Okete	Akorede	Elemere	Malete		
Stop burning of woods	4	1	3	3	2	1	14	23.3%
Walk more, ride less	1	0	0	0	0	0	1	1.7%
Use of animal dungs as fertilizer	1	2	0	0	0	1	4	6.7%
Listen to radio to know planting	4	4	5	0	4	2	19	31.7%
Recycle items	0	0	0	0	1	0	1	1.7%
Partake in environmental issues campaign	0	2	2	4	1	5	14	23.3%
Nonresponses	0	1	0	3	2	1	7	11.7%
Total responses	10	9	10	7	8	9	53	88.3%

The study revealed that a substantial group of the indigenous population in Moro Local Government had limited awareness of climate change, with notable differences between the towns. Although many respondents were aware of changes in the weather patterns, such as increased temperatures and shifting rainfall patterns, there remained a significant gap in their understanding of the causes and effects of climate change. This finding aligns with the conclusions drawn by Lee *et al*., (2015) and Chisebe *et al*., (2024). The result from this study and that of Abid *et al*. (2015) and Chisebe *et al*. (2024) suggests that while the community acknowledges climate change, there is a need for more education on adaptation strategies. The indigenous farming practices, such as mulching and shelterbelts, were seen as crucial in coping with rising temperatures and diminishing rainfall. Furthermore, cultural beliefs, including attributions of climate change to divine punishment, highlight the complexity of addressing climate change in this region. The weak response to adaptation strategies highlights the need for increased community involvement and empowerment, especially in promoting sustainable agricultural practices. While some respondents acknowledged their role in environmental degradation, the adoption of sustainable measures like reforestation and controlled wood burning has been minimal. This aligns with Trevisan *et al*. (2016), who noted that farmers are often hesitant to take risks with new technologies. The role of local governments in facilitating climate adaptation measures, such as public awareness campaigns and support for sustainable land use, is critical for mitigating the impact of climate change on these indigenous communities.

Conclusion: The study revealed a general awareness of changing environmental conditions, with a significant percentage of respondents noticing shifts in rainfall patterns, increasing temperatures, and extended dry seasons. However, the level of knowledge about climate change causes and effects varied, with over half of the respondents being unfamiliar with the concept. Indigenous peoples in the study area were found to be vulnerable to the impacts of climate change, particularly in terms of agricultural productivity and livelihood sustainability. A substantial number of respondents recognized their contribution to environmental degradation through activities like deforestation, yet their response to adaptation strategies remained limited, reflecting a gap in practical knowledge and proactive engagement. While there is an awareness of climate issues, the readiness to take actionable steps remains divided, with half of the population feeling powerless to address the situation. Increase in public awareness and the adoption of sustainable practices be prioritised through education programs by local governments and environmental agencies. Collaboration between local authorities, non-governmental organisations (NGOs), and community members should be encouraged as it will enhance the effectiveness of these initiatives.

Declaration of Conflict of Interest: The authors declare no conflict of interest

Data Availability Statement: Data are available upon request from the first author or corresponding author or the fourth author.

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