

RURAL DWELLERS' AWARENESS OF CLIMATE CHANGE VULNERABILITY IN UKWUANI LOCAL GOVERNMENT AREA, DELTA STATE.

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Abstract

This study assessed the awareness of rural dwellers in Ukwuani Local Government Area (LGA), Delta State, Nigeria, regarding climate change vulnerability. Data were collected from 382 respondents across five communities using structured questionnaires, with a focus on understanding climate change causes, perceived impacts, and local adaptation strategies. The findings revealed that 53% of participants were highly aware of the term "climate change," while knowledge about specific terms like "greenhouse gases" was less widespread. Awareness of climate change's effects on daily activities was higher, but recognition of changing weather patterns was inconsistent. Notable variation in awareness levels was observed across communities, with Ebedei showing the highest level of awareness. Despite moderate to high awareness, gaps remain in understanding specific environmental changes and the science behind climate change, especially concerning greenhouse gases and weather patterns. A moderate positive correlation between awareness and vulnerability was observed, though it was not statistically significant. The study recommends targeted educational programs to address these gaps and enhance understanding of climate change science, thereby empowering communities to better respond to its impacts and vulnerabilities. Further research is needed to explore the factors influencing the relationship between awareness and vulnerability.

Keywords: Climate Change, Awareness, Vulnerability, Rural Communities, Ukwuani

INTRODUCTION.

Climate change is a global challenge with profound effects on vulnerable rural communities, particularly in developing nations like Nigeria. With a significant rural population, Nigeria faces increasing threats from extreme weather events, shifting precipitation patterns, rising sea levels, and prolonged droughts. Limited access to resources and infrastructure further exacerbates the vulnerability of rural communities (Dauda & Akomolafe, 2023). Over the years, growing international discussions on climate change mitigation and the rise of climate-related social movements have heightened public awareness of the issue (Vanghaus et al., 2022).

Increased awareness is considered a critical step in adaptation, as it helps communities manage risks and reduce overall vulnerability (Ado et al., 2019; Sandra et al., 2023). Agriculture, a key sector in Nigeria, is particularly affected by climate change. Farmers provide first-hand observations of its impacts and the adaptation strategies they employ (Ricart et al., 2023). Tibet et al. (2022) noted that individuals often reconcile new information on climate change with their existing beliefs and local knowledge of past weather patterns. Climate risk is intrinsically linked to vulnerability, as climate-related hazards disproportionately affect communities with existing social and economic weaknesses (Selvaraju, 2012).

Awareness of climate change vulnerability has increased globally, with both younger and older generations recognizing the urgent need for action (Guo et al., 2021). Social justice plays a crucial role in climate change discourse, as the most affected populations are often those least responsible for the problem. Discussions on emissions reductions must account for disparities between nations in terms of responsibilities and capacities. Education is a key driver of climate awareness, fostering knowledge, advocacy, and sustainable behaviour. Digital strategies have emerged as one of the most effective tools for reaching large audiences and empowering individuals to take action (Net Impact Staff, 2023).

Rural populations in developing countries face additional challenges that amplify their susceptibility to climate change. These challenges, often geographical in nature, include remote locations, inadequate infrastructure, and socio-economic limitations (Ranger & Garbett-Shiels, 2012). Rural areas are heavily reliant on agriculture and natural resources, suffer from high poverty rates, and receive little attention from policymakers. This dependence on natural resources makes them highly sensitive to climate variability and extreme weather events. Furthermore, low levels of education, economic marginalization, and policy neglect intensify the impact of climate change (Dasgupta et al., 2014). Raising awareness about climate change has proven essential in building resilience, fostering partnerships, and promoting behavioural shifts. Increased awareness encourages proactive engagement and communication among rural stakeholders, leading to greater resilience and reduced climate risks (Luis et al., 2018; Iturriza et al., 2020). In light of these issues, this study examines climate change vulnerability awareness among rural dwellers in Ukwani Local Government Area, Delta State.

Conceptual Issues

Climate awareness is an essential component of global environmental discourse, reflecting the level of understanding individuals and communities have regarding climate change, its causes, and its impacts. This awareness plays a critical role in shaping attitudes, influencing behaviours, and driving policy

changes aimed at mitigating climate change. As scientific consensus on the anthropogenic nature of climate change strengthens, the need for widespread awareness and informed action becomes even more imperative (IPCC, 2021). Climate awareness encompasses knowledge of climate science, the recognition of climate change as a pressing issue, and the willingness to adopt sustainable practices. According to O'Neill and Nicholson-Cole (2009), raising climate awareness involves making scientific information accessible and relevant to different societal groups. The effectiveness of climate awareness initiatives depends on how well individuals grasp the severity of climate change and relates it to their immediate environment. Studies suggest that knowledge alone is insufficient; emotional engagement and perceived personal impact are crucial in fostering meaningful responses (Van der Linden et al., 2015).

The Climate Awareness Model illustrates the dynamic relationships between various factors influencing climate awareness and its outcomes (see Figure 1). At the core of the model is Climate Awareness, which is driven by knowledge dissemination and recognition of climate change issues. Key elements influencing climate awareness include social barriers and government actions, which can either facilitate or hinder awareness and subsequent action. Knowledge dissemination plays a crucial role in ensuring that information reaches individuals and communities, enabling them to recognize the significance of climate change. Once awareness is established, it leads to behavioural change, which directly impacts economic resilience and climate resilience. Economic resilience is influenced by government policies and financial support systems, while climate resilience is linked to individuals' willingness to adopt sustainable practices. The willingness to adopt adaptive and mitigative strategies further strengthens climate resilience, creating a feedback loop that enhances the ability to cope with climate challenges. The model highlights the interconnectedness of awareness, behaviour, and systemic factors in shaping climate resilience. It suggests that fostering awareness alone is insufficient

unless it is supported by enabling policies, economic structures, and a conducive social environment.

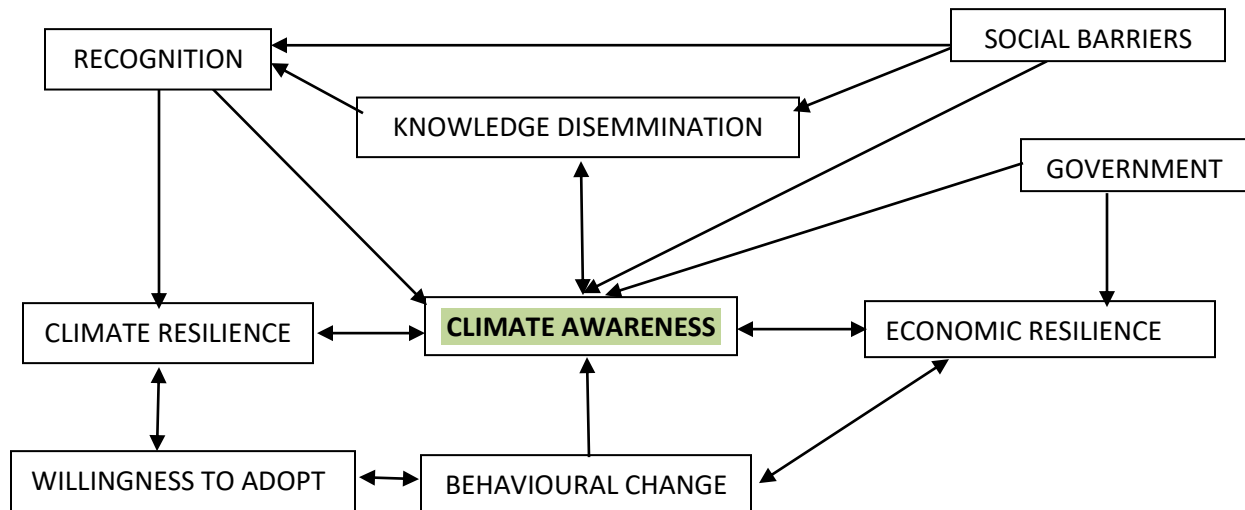


Figure 1: Climate Awareness Model
Source: Author's Conceptualisation

Education is a vital driver of climate awareness. Formal and informal educational approaches help disseminate climate knowledge, encourage critical thinking, and inspire action. Sterling et al. (2017) emphasize that environmental education should not only focus on scientific explanations but also incorporate local and indigenous knowledge to enhance relatability and effectiveness. Schools, media, and digital platforms have become essential channels for climate education, with digital strategies showing promising results in reaching a broader audience (Net Impact Staff, 2023). Climate awareness is shaped by cognitive and social factors, including personal beliefs, cultural norms, and media influence. Tibet et al. (2022) argue that individuals process climate information based on their prior beliefs and local experiences. People in regions experiencing extreme weather events tend to exhibit higher awareness levels due to direct exposure to climate-related hazards. Additionally, social movements and advocacy groups play a crucial role in amplifying climate awareness by framing climate change as a socio-political issue (Vanghaus et al., 2022). A significant aspect of climate awareness is its translation into behavioural change. Studies indicate that awareness alone does not necessarily lead to pro-environmental behaviour; rather, it requires structural support, incentives, and social reinforcement (Gifford & Nilsson, 2014). Behavioural change models suggest that raising

awareness must be accompanied by tangible options for action, such as access to renewable energy, sustainable transportation, and green consumption choices (Ricart et al., 2023).

Despite increasing climate awareness, several barriers hinder its effectiveness in fostering sustainable action. One major challenge is misinformation, which distorts public understanding of climate science and weakens policy support (Cook et al., 2017). Additionally, socio-economic constraints limit the ability of vulnerable populations to respond effectively to climate risks. Rural communities, particularly in developing countries, often lack the necessary infrastructure and resources to act on climate awareness, thereby increasing their vulnerability (Dauda & Akomolafe, 2023). Governments and policymakers recognize climate awareness as a strategic tool for achieving climate resilience. Public engagement campaigns, environmental policies, and international agreements emphasize the importance of awareness in driving climate action. Ranger and Garbett-Shiels (2012) highlight that climate policies are more effective when they incorporate public perceptions and local knowledge. Moreover, climate litigation has emerged as a powerful tool to hold governments and corporations accountable for climate inaction, further emphasizing the role of awareness in shaping legal frameworks (Guo et al., 2021).

Climate awareness is a fundamental aspect of the global response to climate change. It influences individual behaviour, informs policy decisions, and strengthens community resilience. While awareness is growing, challenges such as misinformation and socio-economic barriers persist, requiring targeted interventions. Strengthening education, leveraging digital platforms, and fostering community engagement are key strategies for enhancing climate awareness and promoting sustainable action. Future research should explore innovative approaches to climate communication and assess the long-term impacts of awareness campaigns on climate action.

MATERIALS AND METHOD

The study was conducted in Ukwuani Local Government Area (LGA) of Delta State, Nigeria. Ukwuani LGA is situated in the western part of the Niger Delta region and shares boundaries with Ndokwa West to the east, Ethiope-East to the south, and Orhionmwon in Edo State to the southwest. Geographically, it lies between latitudes 5°51'N and

6°10'N and longitudes 5°10'E and 5°48'E (Atuma & Ojeh, 2013) (see Figure 2). The area is predominantly inhabited by the Ukwuani people, one of the major ethnic groups in the Niger Delta, alongside the Igbo (Asaba), Itsekiri, Ijaw, Isoko, Ika, and Urhobo communities. Ukwuani LGA is characterized by a humid tropical climate with distinct wet and dry seasons. The region experiences heavy rainfall during the wet season, contributing to its rich biodiversity and agricultural productivity. However, its location within the Niger Delta, a zone known for extensive oil exploration, has significantly influenced its environmental conditions. The presence of crude oil deposits has led to large-scale extraction activities, which have contributed to deforestation, soil degradation, and biodiversity loss. These environmental challenges exacerbate the effects of climate change in the area, making local communities more susceptible to rising temperatures and extreme weather events.

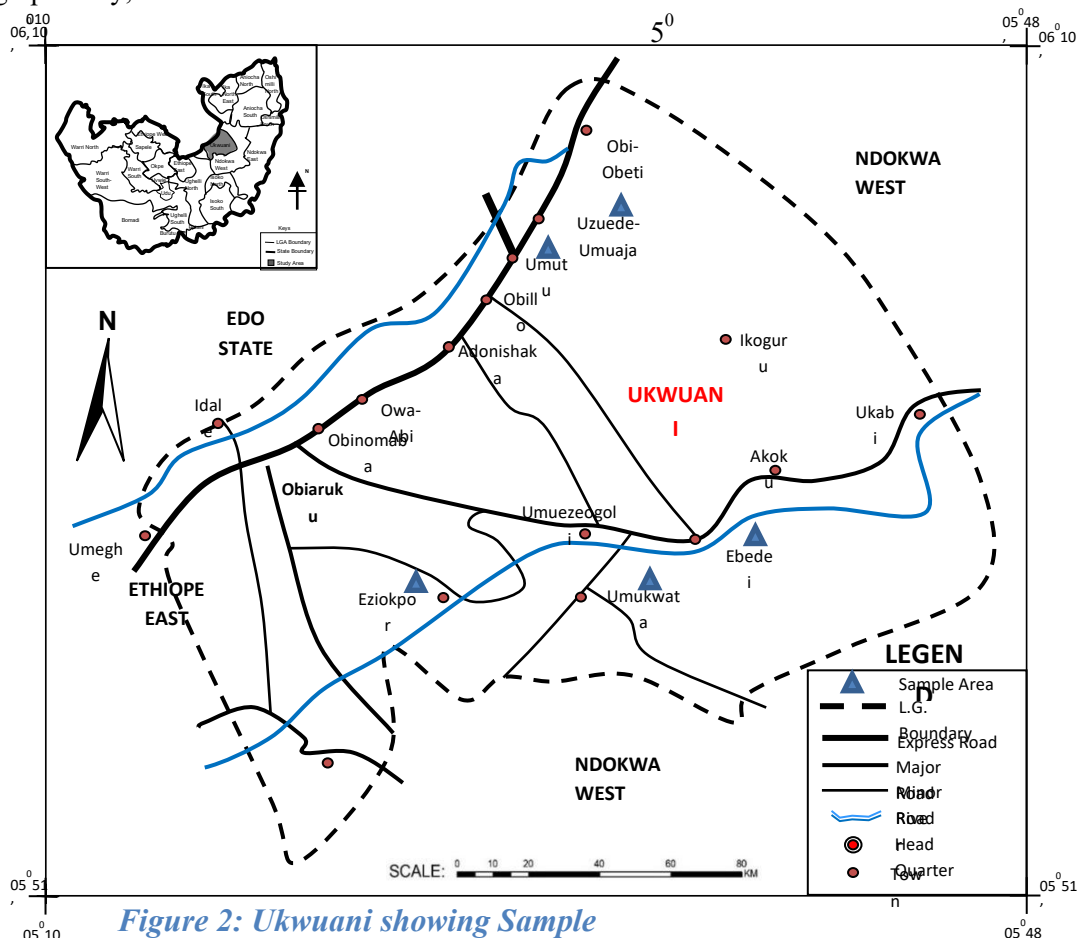


Figure 2: Ukwuani showing Sample

Source: Cartographic Unit of Department of Urban and Regional Planning

The ongoing deforestation, often associated with oil exploration and land clearing, exposes the topsoil to direct sunlight, increasing land surface temperatures and altering local climatic conditions. Additionally, the depletion of natural vegetation affects agricultural output and disrupts the ecosystem, leading to the extinction of certain plant and animal species. These ecological disturbances, coupled with the socio-economic dependence on farming and natural resources, heighten the vulnerability of rural dwellers in Ukwuani to climate change impacts. Given the environmental and socio-economic dynamics of Ukwuani LGA, understanding climate awareness and adaptive capacity within local communities is essential.

The study employed a survey research design to assess the awareness of rural dwellers regarding climate change vulnerability in Ukwuani Local Government Area (LGA) of Delta State, Nigeria. This approach was chosen to obtain first-hand information on the level of climate awareness within the region. Data collection was carried out using structured questionnaires, which were distributed with the assistance of trained research assistants to ensure accurate responses and proper interpretation of questions where necessary. The study focused on five selected communities: Umutu, Umukwata, Eziokpor, Umuaja, and Ebedei (see Figure 2). These communities were chosen due to their geographical spread within the LGA and their engagement in climate-sensitive activities such as agriculture and natural resource utilization. The sample size for the study consisted of 382 adult respondents, representing a fraction of the total population of Ukwuani LGA. The determination of this sample size was guided by statistical principles ensuring adequate representation of the broader population. A simple random sampling

technique was employed in distributing the questionnaires to minimize bias and ensure that participants from diverse socio-economic backgrounds had an equal opportunity to be included in the study.

The questionnaire was designed to capture essential aspects of climate change awareness, including knowledge of climate change causes, perceived impacts, and individual or community-level adaptation strategies. Respondents were asked to indicate their level of understanding of climate-related concepts, sources of climate information, and the extent to which they had observed environmental changes over time. The instrument also sought to explore whether respondents linked local environmental changes to broader climate trends, as well as their attitudes toward sustainable practices. To ensure reliability and validity, the questionnaire underwent a pre-test in a neighbouring community with similar socio-economic characteristics. Feedback from the pre-test informed minor modifications to enhance clarity and eliminate ambiguities in the questions. The collected data were subsequently analysed using descriptive statistics, which allowed for the presentation of findings in a clear and interpretable manner. The use of a survey method was particularly suitable for this study, as it facilitated the collection of quantitative data that could be systematically analysed to determine trends in climate awareness. This method also allowed for a broader participation of community members, thereby enhancing the generalizability of the findings. By engaging respondents from multiple communities, the study provided a comprehensive perspective on the awareness levels of rural dwellers regarding climate change vulnerability in Ukwuani LGA.

RESULTS AND DISCUSSION

Table 1 presents data on the awareness of climate change vulnerability among residents of Ukwuani Local Government Area (LGA), highlighting the varying levels of awareness about climate change and

related issues. Majority of respondents (53%) reported being highly aware of the term “climate change,” with a further 15% moderately aware and 11% slightly aware, indicating a reasonable level of awareness.

However, the knowledge about specific terms like “greenhouse gases” was less widespread, with only 26% being highly aware, while a larger proportion (38%) fell into the moderately aware category.

Table 1: Awareness of Climate Change Vulnerability Among Residents of Ukwuani L.G.A

S/N	Awareness	Scale Rating									
		HA	%	MA	%	U	%	SA	%	NA	%
1	I have heard of “climate change”	184	53	52	15	39	11	37	11	38	11
2	I have heard of the word “Greenhouse Gases”	92	26	134	38	44	13	41	12	39	11
3	Climate change affects our daily activities	101	29	93	27	22	6	86	25	48	14
4	The pattern of weather is generally changing	80	23	57	16	79	23	63	18	71	20
5	Temperature has increased in the past 30 years	115	33	80	23	34	10	101	29	20	6
6	Rainfall has increased in the past 30 years	75	21	120	34	40	11	59	17	56	16
7	Rainy season is longer than dry season	140	40	128	37	24	7	50	14	8	2
8	Human Activity is responsible for climate change	210	60	26	7	13	4	80	23	21	6

Source: Fieldwork, 2024

HA – Highly Aware; **MA** – Moderately Aware; **U** – Undecided; **SA** - Slightly Aware; **NA** – Not Aware

This aligns with findings from similar studies by Adebayo et al. (2020), who noted that while general awareness of climate change is high in many communities, detailed understanding of scientific concepts like greenhouse gases is often lower. In relation to the impact of climate change, 29% of respondents were highly aware that climate change affects daily activities, while 25% were slightly aware, and 27% moderately aware. This suggests a substantial recognition of climate change's practical implications. On the other hand, when asked about the changing weather patterns, the awareness was somewhat mixed, with 23% highly aware and 23% moderately aware, showing an inconsistency in recognizing weather pattern shifts, which corresponds with the work of Adebola et al. (2021) who observed that while general awareness exists, many communities struggle to link climate change to observable weather changes.

Regarding temperature and rainfall trends, the responses showed notable variation. For instance, 33% of respondents believed that temperatures have increased over the past 30 years, with 29% of respondents expressing awareness of increased rainfall in the same period. These responses suggest a reasonable awareness of environmental shifts, although there was a considerable percentage of

respondents (34%) who were undecided on whether rainfall had increased, reflecting uncertainty on the issue. Studies by Nwosu and Nwachukwu (2019) confirm such ambivalence, pointing out that many people are unsure about the specifics of climate change effects, despite acknowledging its general existence.

In terms of seasonal patterns, 40% of respondents were highly aware that the rainy season lasts longer than the dry season, which mirrors the findings of a similar study by Ijioma (2020), who found that climate change impacts such as longer rainy seasons are more readily acknowledged by residents in rural areas. The perception that human activity is responsible for climate change was the highest in awareness levels, with 60% of respondents being highly aware, which aligns with global trends where climate change is largely associated with human-induced activities, as supported by findings from Okorie et al. (2022). This table indicates that while the residents of Ukwuani LGA show a moderate to high awareness of climate change, there remains a significant proportion of people who are undecided or slightly aware, particularly regarding specific concepts such as greenhouse gases and detailed weather patterns. Further education and outreach efforts are necessary to bridge these gaps and enhance

a more comprehensive understanding of climate change and its impacts.

Table 2 presents the variation in climate change vulnerability awareness among rural dwellers across

five communities in Ukwuani Local Government Area (L.G.A.).

Table 2: Variation in climate change vulnerability awareness among rural dwellers in Ukwuani

Level of awareness	Test Value = 0.05					
	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Umukwata	2.446	4	.071	20.15000	-2.7182	43.0182
Umuaja	3.791	4	.019	19.95000	5.3374	34.5626
Eziokpor	4.582	4	.010	20.15000	7.9400	32.3600
Ebedei	14.473	4	.000	19.95000	16.1229	23.7771
Umutu	3.826	4	.019	20.15000	5.5268	34.7732

Source: Fieldwork, 2024

The table summarizes the results of statistical tests (t-tests) comparing the awareness levels in these communities, providing mean differences and confidence intervals. The test values in the table indicate varying levels of awareness across the communities. Umukwata shows a mean difference of 20.15, with a p-value of 0.071, which is just above the commonly accepted threshold of 0.05, suggesting that the difference in awareness is not statistically significant. This finding aligns with similar research by Okon et al. (2020), who also reported limited significant differences in rural awareness levels when climate change was discussed in smaller communities. In contrast, Umuaja, with a p-value of 0.019, shows a significant difference in awareness, meaning that the variation in understanding climate change vulnerability between residents in this area is statistically significant. This aligns with findings by Akinyemi (2018), who noted that in rural regions, some communities exhibit higher awareness levels due to better access to information or local initiatives. Eziokpor also presents a statistically significant result with a p-value of 0.010, reinforcing the trend observed in Umuaja. The higher level of awareness in Eziokpor, with a mean difference of 20.15, suggests that certain factors, such as local education programs or more direct exposure to climate-related events, may be influencing residents' understanding of climate change. This is consistent with research by Chukwu (2021), who emphasized the role of localized climate

adaptation programs in increasing awareness in rural Nigerian communities.

Ebedei shows a particularly high t-value of 14.473 and a p-value of 0.000, indicating a very significant difference in awareness levels. This suggests that the residents of Ebedei exhibit a much higher awareness of climate change vulnerability compared to the other communities in the study. This finding is similar to that of Adebayo et al. (2022), who reported significant regional disparities in climate change awareness, with some areas having more extensive community engagement. Mutu, with a mean difference of 20.15 and a p-value of 0.019, also demonstrates a significant difference in awareness, pointing to an increasing trend in certain rural areas where residents have a clearer understanding of climate change impacts. This result complements those found by Nwachukwu et al. (2020), who observed a growing awareness of environmental issues in rural settings, influenced by factors such as local advocacy and media outreach. The table highlights significant variations in climate change vulnerability awareness across the five communities, with Ebedei standing out for its particularly high level of awareness. These differences are consistent with findings from similar studies that emphasize the role of local factors, such as education programs and community engagement, in shaping climate change understanding in rural areas.

Table3: Correlation Coefficient of level of awareness of the rural dwellers and climate change vulnerability

Level of climate change awareness	N	Correlation	Sig.
	5	.542	.746

Source: Fieldwork, 2024

Table 3 presents the correlation coefficient between the level of climate change awareness and climate change vulnerability among rural dwellers. The correlation value is 0.542, which indicates a moderate positive relationship between the two variables. This suggests that as awareness of climate change increases, there is a corresponding increase in the understanding of its vulnerability. However, the significance level ($p = 0.746$) is notably high, well above the conventional threshold of 0.05, indicating that this relationship is not statistically significant. This observation is supported by similar studies, such

as those by Nwachukwu et al. (2020), who noted that in small rural samples, the relationship between awareness and vulnerability might be evident but not statistically conclusive.

Additionally, the moderate correlation suggests that while awareness plays a role in recognizing climate change vulnerability, other factors, such as local socioeconomic conditions, exposure to climate events, or access to education, may also influence perceptions. This aligns with findings by Ogbuoji (2021), who observed that in rural areas, climate change awareness does not always directly correlate with vulnerability perceptions, as other contextual elements can shape understanding. While there is a moderate positive correlation between awareness and vulnerability, the high p -value signals that the relationship is not statistically significant in this study.

Table 4: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta	t		Lower Bound	Upper Bound
(Constant)	107.441	62.335			.116	-13.609	14.409
Level of awareness – Climate change	5.009	2.189	.586	5.079	.941	.361	.346

Source: Fieldwork, 2024

Table 4 presents the results of a regression analysis examining the relationship between climate change awareness and vulnerability in rural communities. The unstandardized coefficient for the level of awareness (5.009) suggests that as awareness increases, vulnerability also rises, although the relationship is moderate. The standardized coefficient (Beta = 0.586) indicates a relatively strong effect of awareness on vulnerability, showing that changes in awareness can notably influence perceptions of vulnerability. However, the significance value ($p = 0.346$) exceeds the typical 0.05 threshold, implying that this relationship is not statistically significant. This is consistent with findings by Nwachukwu et al. (2020), who also noted weak statistical significance in small rural samples despite observable trends in climate change awareness and vulnerability perceptions. The t -value of 5.079 further reinforces that while there is a

noticeable relationship between awareness and vulnerability, the lack of statistical significance diminishes the robustness of the result. The confidence interval for the coefficient (Lower Bound = 0.361, Upper Bound = 14.409) suggests that the true effect could range from modest to higher, reflecting uncertainty in the relationship's strength. This finding aligns with Ogbuoji (2021), who noted that climate change awareness impacts vulnerability perceptions, but other factors, such as local climate exposure or socioeconomic status, can also play a significant role. Awareness has a moderate effect on vulnerability perceptions, the lack of statistical significance highlights the need for further research, possibly with larger sample sizes, to fully understand the dynamics at play.

Table 5: ANOVA on the difference in the level of climate change awareness among the rural dwellers

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	6178.429	12	514.869	6.093	.307
Within Groups	84.500	1	84.500		
Total	6262.929	13			

Source: Fieldwork, 2024

Table 5 presents the results of an Analysis of Variance (ANOVA) examining climate change awareness differences among rural dwellers. The between-group sum of squares (6178.429) indicates the variation in awareness across the groups, while the within-group sum of squares (84.500) shows variation within each group. The F-value of 6.093 suggests some variation between groups, but the p-value of 0.307 exceeds the 0.05 threshold, indicating that the differences are not statistically significant. This finding is consistent with Adebayo et al. (2022), who observed that differences in rural climate change awareness, while noticeable, often do not reach statistical significance, possibly due to factors such as sample size or regional uniformity. Similarly, Ogbuonji (2021) noted that while rural communities may exhibit varying awareness levels, the differences are not always substantial enough to be statistically meaningful. The total sum of squares (6262.929) reflects the overall variation in the data. The lack of statistical significance suggests that factors influencing awareness may be more uniform across the groups or that other unaccounted variables might be impacting the outcomes. Thus, the high p-value, despite the observed F-value, highlights the need for further investigation into other potential factors, such as local interventions or access to information, which may contribute to awareness but were not captured in this analysis.

The study examines climate change vulnerability awareness among rural dwellers in Ukwuani Local Government Area (LGA), revealing varying levels of understanding. The majority of respondents (53%) reported high awareness of the term "climate change," while 15% were moderately aware and 11% slightly aware. Awareness of "greenhouse gases" was less widespread, with only 26% highly aware. Adebayo et

al. (2020) similarly found general awareness of climate change but noted lower comprehension of specific scientific terms. Awareness of climate change's effects on daily activities was higher, with 29% highly aware. The recognition of changing weather patterns was inconsistent, with equal proportions (23%) highly and moderately aware. Nwosu and Nwachukwu (2019) also found uncertainty in recognizing the effects of climate change. Regarding temperature and rainfall trends, 33% noted increased temperatures, and 29% recognized increased rainfall over the past 30 years, although 34% were undecided. Ijioma (2020) found rural residents acknowledged longer rainy seasons but often struggled with specifics.

Human activity's role in climate change was strongly recognized, with 60% highly aware, supporting Okorie et al. (2022). Despite a generally moderate to high awareness, significant gaps remain, particularly around greenhouse gases and specific weather patterns. These gaps indicate the need for further education and outreach. Significant differences in awareness were found in Umuaja ($p = 0.019$), Eziokpor ($p = 0.010$), and Ebedei ($p = 0.000$), suggesting local factors, such as educational programs and exposure to climate-related events, influence awareness levels. At high p-value (0.746) indicates this relationship is not statistically significant. The increased awareness of climate change corresponds to higher vulnerability perceptions (coefficient = 5.009), though the lack of statistical significance ($p = 0.346$). The study revealed that differences in climate change awareness across groups are not statistically significant ($p = 0.307$). However, there is moderate to high awareness of climate change in Ukwuani, the findings highlight the need for further research and

education to address knowledge gaps and strengthen the relationship between awareness and vulnerability.

CONCLUSION

The study reveals that while there is a moderate to high level of awareness about climate change among residents of Ukwuani Local Government Area (LGA), significant gaps exist, particularly in understanding specific scientific concepts like greenhouse gases and the effects of changing weather patterns. The findings suggest that although the majority of residents recognize climate change and its impacts on daily life, there is considerable uncertainty regarding precise environmental changes, such as temperature and rainfall trends. Awareness of human activity's role in climate change is notably high, which underscores the potential for greater community engagement in climate action. The variation in awareness levels across different communities indicates that local factors, such as educational initiatives and exposure to climate-related events, influence residents' understanding of climate change. Some areas, such as Ebedei, show particularly high levels of awareness, highlighting the importance of targeted local interventions in improving climate change literacy.

Based on these findings, it is recommended that tailored educational programs be introduced across all communities in the LGA to address the identified knowledge gaps. Special focus should be placed on explaining scientific concepts like greenhouse gases and the specific local effects of climate change. Additionally, increasing the frequency of community-based climate change awareness campaigns and leveraging local experiences of climate change could foster deeper understanding and more proactive adaptation strategies. The implications of these findings point to the necessity of enhancing climate change education, not only to improve general awareness but also to empower residents to better recognize and respond to the vulnerabilities posed by climate change. A more informed population is better equipped to engage in mitigation efforts, reduce risks, and adapt to changing environmental conditions, ultimately contributing to more sustainable

communities in Ukwuani and similar rural areas. Further research is also needed to explore the underlying factors that influence the relationship between awareness and vulnerability, ensuring more robust strategies for climate change adaptation.

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