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# Perceived Health Impacts of Global Warming Among Residents in South-West Nigeria: A Comparative Study of Ijebu-Ode and Atisbo Local Government Areas, Nigeria

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## ABSTRACT

Global warming is increasingly linked to deteriorating human health outcomes in sub-Saharan Africa, yet most Nigerian community-level evidence comes from single-site studies that did not reveal whether perceived effects are local or regional. This study compared perceived health effects of global warming among adult residents of Ijebu-Ode Local Government Area (LGA), Ogun State (peri-urban), and Atisbo LGA, Oyo State (rural), South-West Nigeria. A descriptive cross-sectional survey design was used with stratified random sampling of 300 respondents in Ijebu-Ode and 301 in Atisbo (combined N = 601). A structured, validated questionnaire measured perceptions across four domains-malnutrition, heat waves, drought and infectious disease vectors-and four null hypotheses were tested at each site using chi-square ($\alpha = 0.05$, df = 3, critical value = 7.82). All four hypotheses were rejected at both sites, showing that residents significantly perceived malnutrition, heat waves, drought and infectious disease vectors as health effects of global warming. Response proportions were closely matched across the two LGAs, with infectious-disease-vector items drawing the strongest agreement (83–90%). The convergence of findings across a peri-urban and a rural LGA suggests a shared South-West Nigerian pattern requiring coordinated, multi-tiered climate adaptation policy.

**Keywords:** Climate change, comparative study, global warming, health perception, human health, South-West Nigeria

## INTRODUCTION

Global warming refers to a change in the state of the climate, identifiable through statistical tests, in the mean or variability of its properties, persisting for an extended period, typically decades or

longer [1]. Its consequences include fiercer and longer weather cycles, extreme heat, increased rainfall intensity, and more frequent storms, floods, droughts and fires, all of which are linked to malnutrition and poverty [1].

In Nigeria, direct health consequences of climate variability include cerebrospinal meningitis, cardiovascular and respiratory disorders among the elderly, skin cancer, hypertension, malaria and cholera [2]. Indirect consequences include heightened morbidity through the exacerbation of established and emerging health risks such as heat stroke, influenza and psychological disorders [3]. Nigeria's national climate profile confirms that rising temperature and shifting rainfall patterns are already measurable across the country's ecological zones [4].

Previous studies on this topic have either being broad overviews or disease-specific projections rather than community-perception surveys. Raimi, Odubo and Omidiji reviewed Nigeria's climate-health burden across multiple regions but did not collect primary survey data on how residents perceived these risks [5]. Diouf et al. modelled future malaria transmission shifts under warming scenarios for West Africa using climate-epidemiology projections rather than laid perception data [6], whereas Chapoterera, Naidoo and Marume's reviewed malaria-climate literature across Africa with synthesised modelling and surveillance studies rather than community knowledge and attitude surveys [7]. None of these studies compared two LGAs using an identical instrument. It remains unclear whether the health effects in the Nigerian communities, attributed to global warming, are consistent across settlement types or specific to the locality studied.

Most existing Nigerian evidence on community perception of these effects is confined to single localities, leaving unclear evidence whether perceived harm is a localised phenomenon or a broader regional signal. This study addresses that gap by applying an identical measurement approach concurrently in two South-West Nigerian LGAs of contrasting settlement type - peri-urban Ijebu-Ode (Ogun State) and rural Atisbo (Oyo State) - with the objectives of determining whether residents in both LGAs significantly perceive malnutrition, heat waves, drought and infectious disease vectors as health effects of global warming, and whether the pattern of perception differs between the two settlement types.

## MATERIALS AND METHODS

A descriptive cross-sectional survey design was adopted at both sites. The population comprised all residents of Ijebu-Ode LGA, Ogun State, and Atisbo LGA, Oyo State. Stratified random

sampling was used at both sites: Ijebu-Ode was stratified into four quarters (Porogun, Iwade, Oniworo and District), from which 75 respondents were drawn per quarter (N = 300); Atisbo was stratified into seven communities (Ago-Are, Tede, Irawo, Sabe, Baasi, Ofiki and Owo), from which approximately 43 respondents were drawn per community (N = 301). Table 1 presents the comparative sample distribution across the two sites.

Table 1: Comparative sample distribution

| Site | Stratification unit | Respondents per unit | Total sample |
|---|---|---|---|
| Ijebu-Ode LGA (Ogun State) | 4 quarters | 75 | 300 |
| Atisbo LGA (Oyo State) | 7 communities | ≈43 | 301 |

An identical structured questionnaire was used at both sites, comprising Section A (demographic data) and Section B (a four-point Likert scale of Strongly Agree, Agree, Disagree and Strongly Disagree across the four thematic domains). The instrument was face-validated by three experts in Physical and Health Education, Measurement and Evaluation, and Geography/Anthropology, and yielded a test-retest reliability coefficient of 0.72 over a two-week interval, obtained from a neighbouring LGA at each site.

Demographic data were analysed using simple percentages. The four hypotheses were tested independently at each site using the chi-square ($\chi^2$) statistic at the 0.05 level of significance with 3 degrees of freedom (critical value = 7.82). Because the two datasets were collected as separate site-level studies, the two sets of results are compared descriptively using response proportions. The questionnaire used in this study is provided in Appendix A.

## RESULTS AND DISCUSSION

Table 2 presents the comparative demographic profile of respondents at both sites. The two sites yielded closely matched demographic profiles — both slightly male-majority (≈51%), dominated by the 21–30-year age bracket (≈40%), and with single respondents forming the largest marital-status group (≈46%), as shown in Table 2.

Table 2: Comparative demographic profile of respondents

| Variable | Category | Ijebu-Ode n (%) | Category | Atisbo n (%) |
|---|---|---|---|---|
| Sex | Male | 154 (51.33) | Male | 154 (51.16) |
| | Female | 146 (48.67) | Female | 147 (48.84) |
| Age | 21–30 yrs | 121 (40.33) | 21–30 yrs | 121 (40.20) |
| | 31–40 yrs | 73 (24.33) | 31–40 yrs | 73 (24.25) |
| | 41–50 yrs | 57 (19.00) | 41–50 yrs | 58 (19.27) |
| | 51–60 yrs | 29 (9.67) | 51–60 yrs | 29 (9.63) |
| | 61+ yrs | 20 (6.67) | 61+ yrs | 20 (6.64) |
| Marital status | Single | 137 (45.67) | Single | 137 (45.51) |
| | Married | 95 (31.67) | Married | 95 (31.56) |
| | Widowed | 44 (14.66) | Widowed | 45 (14.95) |
| | Divorced | 24 (8.00) | Divorced | 24 (7.97) |

Table 3 and Figure 1 summarise, for each of the four thematic domains, the proportion of respondents at each site who agreed or strongly agreed with each survey item. The pattern is strikingly consistent across both LGAs: the infectious-disease-vector domain drew the strongest agreement (83–90%) at both sites, while the item on drought being globally traceable to global warming drew the weakest agreement (≈30%), against far stronger endorsement of its locally observable consequences — water-table decline and desert encroachment (64–76%).

Table 3: Comparative agreement (Strongly Agree + Agree) by thematic domain

| Thematic item | Ijebu-Ode % agree | Atisbo % agree |
|---|---|---|
| Global warming has contributed to malnutrition | 78.0 | 77.7 |
| Drought reduces dietary variety/consumption | 73.3 | 73.1 |
| Global warming reduces farm/food-crop output | 76.3 | 76.1 |
| Frequent hot weather is due to global warming | 63.3 | 63.1 |
| Global warming has contributed to heat waves | 67.3 | 67.1 |
| Unfavourable climate conditions experienced | 67.7 | 67.4 |
| Global drought is traceable to global warming | 30.0 | 30.2 |
| Drought has negatively affected the water table | 64.0 | 64.1 |
| Desert encroachment linked to reduced rainfall | 75.7 | 75.4 |
| Global warming raises vector-borne disease rates | 83.3 | 83.1 |

| Thematic item | Ijebu-Ode % agree | Atisbo % agree |
|---|---|---|
| Emissions increase distribution of disease vectors | 83.3 | 83.1 |
| Warming favours habitation of harmful vectors | 89.7 | 89.4 |

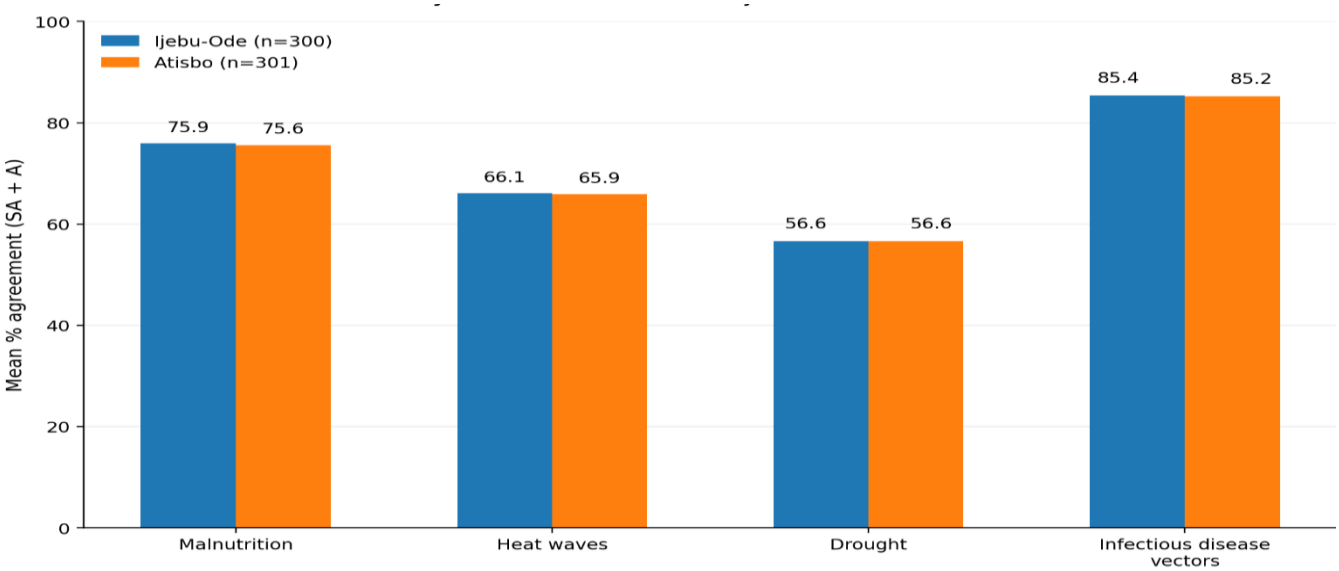


Table 4 and Figure 2 present the chi-square test results for each hypothesis at both sites.

Table 4: Chi-square summary (df = 3, critical value = 7.82, α = 0.05)

| Hypothesis | $\chi^2$ (Ijebu-Ode) | $\chi^2$ (Atisbo) | Decision (both sites) |
|---|---|---|---|
| Malnutrition | 102.98 | 102.98 | Reject Ho — significant |
| Heat waves | 10.07 | 10.07 | Reject Ho — significant |
| Drought | 59.19 | 58.85 | Reject Ho — significant |
| Infectious disease vectors | 184.91 | 184.91 | Reject Ho — significant |

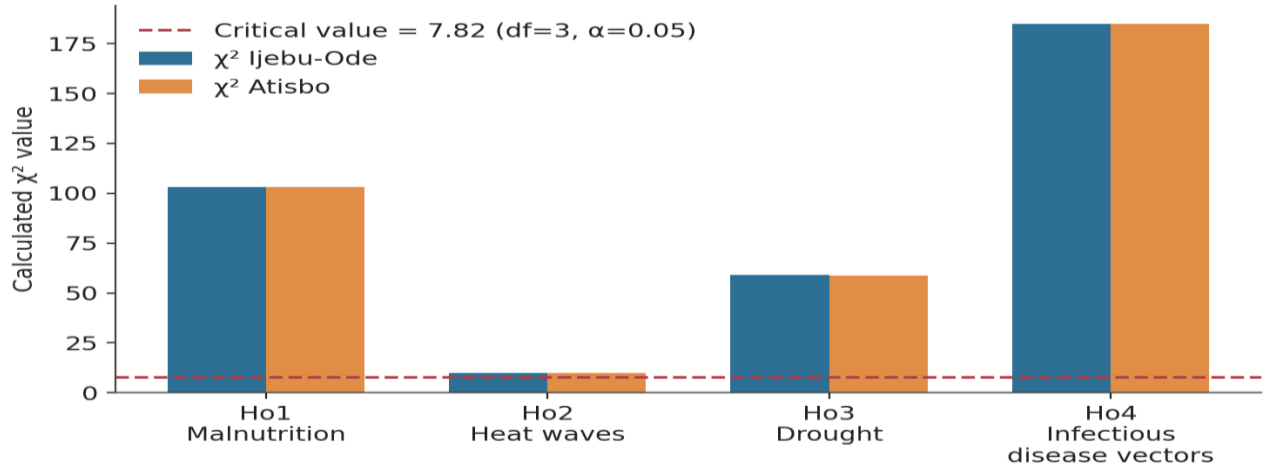


Figure 2: Calculated $\chi^2$ values by hypothesis against the critical value, Ijebu-Ode vs. Atisbo.

At both sites, the calculated $\chi^2$ value exceeded the critical value of 7.82 for all four hypotheses, so all four null hypotheses were rejected. That every hypothesis reached the same statistical conclusion at both a peri-urban and a rural LGA is itself the key comparative finding: it indicates a shared, cross-site pattern of climate-health perception across South-West Nigeria rather than a site-specific artefact.

The rejection of the malnutrition hypothesis at both sites is consistent with projections that malnutrition would rise with climate change, mediated through drought-driven reductions in dietary diversity and consumption [8]. The heat-wave finding aligns with the documented association between hotter days and nights and short-term increases in morbidity among susceptible groups [9], though this domain produced the smallest $\chi^2$ and the lowest agreement at both sites, suggesting heat-wave attribution is the least settled of the four perceptions among lay respondents. For drought, the gap between low agreement that drought is globally traceable to warming (≈30%) and high agreement with its local manifestations replicated closely across both LGAs, consistent with evidence that the health effects of drought are strongly linked to local climate and environmental conditions [5]. The infectious-disease-vector domain (Table 3, Figure 1) produced the strongest agreement and largest $\chi^2$ (Table 4, Figure 2) at both sites, consistent with the well-documented shift in the range of vector-borne diseases such as malaria under a warming climate [6, 7].

This pattern sits within a wider, worsening regional picture. Africa is projected to bear a disproportionate share of climate-driven health burden even under moderate warming scenarios,

with malaria transmission zones expected to expand across West Africa in the coming decades [7, 10]. Climate-linked child malnutrition has already been documented as compounding conflict-related nutrition crises across the Sub-Saharan region [11, 12], and biodiversity loss associated with warming carries its own direct ethical and health implications for children [13].

Food security modelling for Sub-Saharan Africa similarly projects worsening outcomes without adaptation investment [14], a picture corroborated by recent regional food-insecurity monitoring [15] and by UNICEF's documentation of severe child food poverty linked jointly to conflict and climate stress in Nigeria [16]. Continent-wide climate monitoring confirms that 2021 ranked among Africa's warmest years on record [10], and mental health outcomes are increasingly recognised as a further, less visible consequence of this warming trend [17].

Nigeria's own national vulnerability assessment and WHO/UNFCCC climate-health country profile both identify the same four domains — food security, heat, water stress and vector-borne disease — as the country's priority climate-health risks (Table 3) [18, 19], while broader air-quality deterioration linked to climate change compounds the respiratory burden already evident in the Eke and Onafalujo Nigerian findings [20]. Regional health leadership has explicitly called for urgent, coordinated African climate action on exactly these grounds [21].

## CONCLUSION

This comparative study met its objective of testing whether perceived health effects of global warming are shared across a peri-urban and a rural LGA in South-West Nigeria. Residents of both Ijebu-Ode and Atisbo significantly perceive malnutrition, heat waves, drought and infectious disease vectors as health effects of global warming, and the near-identical statistical outcomes and agreement proportions across the two sites indicate that these perceptions reflect a broader regional reality rather than isolated local concerns. It is recommended that Nigeria and other industrialising nations reduce reliance on fossil fuels that generate heat-trapping emissions; that state and federal governments pursue and domesticate binding emissions-reduction commitments; that primary health care facilities in both peri-urban and rural LGAs be strengthened to absorb the additional burden of climate-sensitive illness; that health policy explicitly target malaria, meningitis, cholera and pneumonia for climate-adjusted surveillance; and that future research pool data from multiple LGAs within a single concurrent survey design to permit formal statistical testing of regional versus local variation in climate-health perception.

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## APPENDIX A

## SURVEY INSTRUMENT

The following structured questionnaire was administered, in identical form, to respondents in Ijebu-Ode LGA and Atisbo LGA.

**Section A: Demographic Data**

1. Sex: Male ( ) Female ( )
2. Age: 21–30 yrs ( ) 31–40 yrs ( ) 41–50 yrs ( ) 51–60 yrs ( ) 61+ yrs ( )
3. Marital status: Single ( ) Married ( ) Widowed ( ) Divorced ( )

**Section B: Perceived Health Effects of Global Warming**

Please indicate your level of agreement with each statement: Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD).

***Malnutrition***

4. Global warming has contributed to malnutrition. SA ( ) A ( ) D ( ) SD ( )
5. Drought reduces dietary variety/consumption. SA ( ) A ( ) D ( ) SD ( )
6. Global warming reduces farm/food-crop output. SA ( ) A ( ) D ( ) SD ( )

***Heat Waves***

7. Frequent hot weather is due to global warming. SA ( ) A ( ) D ( ) SD ( )
8. Global warming has contributed to heat waves. SA ( ) A ( ) D ( ) SD ( )
9. I have experienced unfavourable climate conditions. SA ( ) A ( ) D ( ) SD ( )

***Drought***

10. Global drought is traceable to global warming. SA ( ) A ( ) D ( ) SD ( )
11. Drought has negatively affected the water table. SA ( ) A ( ) D ( ) SD ( )
12. Desert encroachment is linked to reduced rainfall. SA ( ) A ( ) D ( ) SD ( )

***Infectious Disease Vectors***

13. Global warming raises vector-borne disease rates. SA ( ) A ( ) D ( ) SD ( )
14. Emissions increase the distribution of disease vectors. SA ( ) A ( ) D ( ) SD ( )
15. Warming favours the habitation of harmful vectors. SA ( ) A ( ) D ( ) SD ( )