

Perception on the Environmental Conditions by Adults and the Influence of Physical Education Infrastructure on the Recreational Pursuits of Secondary School Students in Atisbo Local Government Area, Oyo State, Nigeria

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Accepted: August 21, 2026 **Published Online:** August 28, 2026

ABSTRACT

A warm climate and inadequate school recreational facilities are typically studied separately, yet within a single local government area (LGA) they act on the same young population and the same outdoor spaces. This study integrates two community-level datasets from Atisbo LGA, Oyo State: a household survey of 301 adult residents on perceived climate conditions, and a survey of 200 secondary school students across four schools on the influence of physical education (PE) provision on recreational pursuit. Adult respondents significantly perceived increased heat waves and unfavourable climatic conditions ($\chi^2 = 10.07$, $df = 3$, $p < 0.05$). Independently, students reported that recreational centres ($\chi^2 = 82.0$), qualified personnel ($\chi^2 = 27.0$), facilities ($\chi^2 = 25.3$) and equipment ($\chi^2 = 27.0$) each significantly influenced recreational pursuit (all $p < 0.05$). These findings indicate that Atisbo students face a resource-constrained recreational environment, which is exacerbated by exposure to rising ambient temperature. Recreation and physical education policies for Atisbo LGA should therefore be both heat-informed and resource informed, with outdoor sessions scheduled to avoid peak heat hours.

Keywords: Global warming, heat perception, physical education, recreational pursuit, secondary school students, Atisbo LGA.

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 decades or longer [1]. One of its most

immediate and least-studied consequences for young people is heat exposure during outdoor physical activity: paediatric guidance has long recognised that children and adolescents are physiologically more vulnerable to heat stress during exercise than adults [2], and sports-medicine bodies have issued explicit position statements on managing exertional heat illness in youth athletic and recreational settings [3]. Recent evidence has begun to quantify this link directly.

Rising ambient temperature has been shown to reduce preschoolers' outdoor physical activity time [4], and school yard temperature and shade cover have been found to significantly affect children's physical activity levels during recess [5]. Outdoor recreation and school-based physical education depend on two things being available at the same time: adequate infrastructure (centres, personnel, facilities and equipment) and tolerable outdoor conditions. Nigerian research on youth recreation has tended to examine the first condition in isolation [6, 7, 8], while climate research has separately examined community perceptions of warming and heat stress [9]; few studies bring the two together within a single LGA, even though both operate on the same students, the same school compounds and the same outdoor recreational spaces.

Existing Nigerian recreation facility studies illustrate the resourcing side of this picture without reference to climate: Agbabiaka, Doguwa and Ukpung reported that facility availability was the strongest predictor of female students' recreational participation at a northern Nigerian university [6]. Diejomaoh, Akatah and Tayire revealed widespread shortages of sports facilities and equipment across local government areas of Delta State [7], and Adeyemo also reported a facility-driven recreational pattern among Ekiti State tertiary students [8]. On the climate side, Eke and Onafalujo reported that Nigerians already attribute a range of health risks, including heat-related illness, to a changing climate [9]. However they did not examine recreation or youth outdoor activity specifically. Internationally, Koepp et al. [4] and Lanza et al. [5] linked ambient temperature directly to children's outdoor activity levels, but neither was conducted in a Nigerian or West African setting. To the authors' knowledge, no study has combined these two strands - climate perception and recreational-infrastructure adequacy - within a single Nigerian LGA, which is the gap this study addresses.

This study addresses that gap by integrating two independently conducted studies set in Atisbo LGA, Oyo State: a community household survey capturing adult residents' perception of

global warming and heat conditions, and a school-based survey capturing secondary students' recreational pursuit as influenced by the provision of centres, personnel, facilities and equipment. The objective is to determine, first, whether Atisbo residents significantly perceive heat waves as an effect of global warming; second, whether recreational centres, personnel, facilities and equipment significantly influence students' recreational pursuit; and third, what the co-occurrence of these two findings within the same LGA implies for recreation and physical education policies.

MATERIALS AND METHODS

A descriptive survey design was used for both component studies. The community-perception component sampled 301 adult residents across communities of Atisbo LGA. The recreational-pursuit component sampled 200 students, randomly selected without bias, from four secondary schools in the LGA: Baptist Secondary Grammar School, Ago-Are; Christ Comprehensive High School, Ago-Are; Progressive Secondary Grammar School, Tede; and Community Grammar School, Irawo-Owode.

Atisbo LGA lies in the Okeogun zone of Oyo State, South-West Nigeria, centred at approximately 8°30'N, 3°30'E, with its administrative headquarters at Tede [10]. The LGA covers approximately 2,997 km² and is bounded by Orire LGA to the west, the Republic of Benin to the east, Saki East LGA to the north, and Itesiwaju and Iwajowa LGAs to the south. It falls within Oyo State's northern guinea savanna vegetation belt, with an equatorial climate marked by a wet season (April–October) and a dry season (November–March) [10]. The population is predominantly rural and agrarian, comprising the constituent communities of Ago-Are, Tede, Irawo, Sabe, Baasi, Ofiki and Owo.

Both components used a structured, close-ended questionnaire (Strongly Agree, Agree, Disagree, Strongly Disagree) in two sections — demographic data and topic-specific items — face-validated by subject experts, with test-retest reliability of 0.72 obtained from a neighbouring LGA over a two-week interval. Demographic data were analysed with simple percentages. Hypotheses in both components were tested using chi-square (χ^2) at the 0.05 level of significance with 3 degrees of freedom (critical value = 7.82). Because the two datasets were collected from different respondent groups (adults vs. students) using separately administered instruments, they

are analysed as complementary evidence within the same LGA rather than pooled into a single statistical model. The questionnaire used in this study is provided in Appendix A.

RESULTS AND DISCUSSION

Table 1 presents adult residents' agreement with each heat/climate perception item in Atisbo LGA.

Table 1: Adult resident perception of heat/climate conditions in Atisbo LGA (n = 301)

Survey item	SA	A	D+SD	% agree
Frequent hot weather is a result of global warming	100	90	111	63.1
Global warming has significantly contributed to heat waves	94	108	99	67.1
Unfavourable climate conditions have been experienced due to warming	95	108	98	67.4

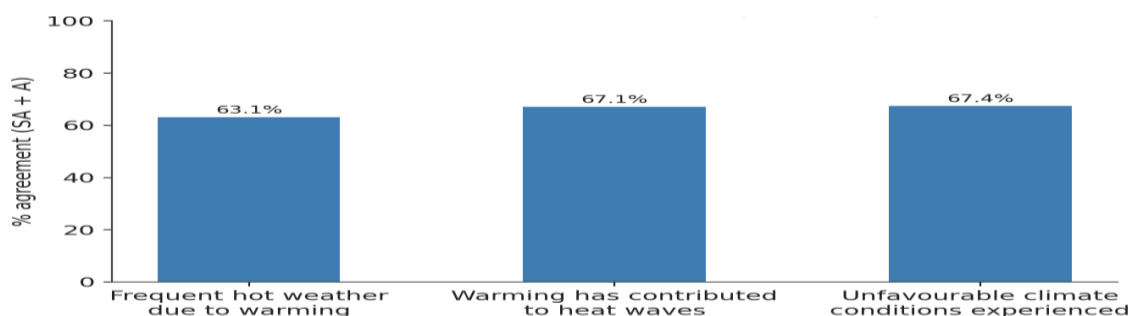


Figure 1: Adult resident agreement with heat/climate perception items, Atisbo LGA (n = 301).

Table 2 reports the chi-square test of the heat-waves hypothesis for Atisbo LGA.

Table 2: Chi-square test - heat waves hypothesis (Atisbo, df = 3, critical value = 7.82)

Hypothesis	χ^2 calculated	χ^2 critical	Decision
Heat waves not a significant perceived effect of global warming	10.07	7.82	Reject Ho — significant

Between 63% and 67% of adult residents agreed with each heat/climate item (Table 1, Figure 1), and the chi-square test (Table 2) confirmed this as a statistically significant pattern of perception rather than a chance distribution of responses.

Table 3 and Figure 2 present the chi-square test results for the four determinants of recreational pursuit among Atisbo secondary school students.

Table 3: Chi-square summary - determinants of recreational pursuit (Atisbo students, n = 200, df = 3, critical value = 7.82)

Determinant	% SA+A	χ^2 calc.	χ^2 crit.	Decision
Provision of recreational centres	80.0	82.0	7.82	Reject Ho — significant
Provision of qualified personnel	60.0	27.0	7.82	Reject Ho — significant
Adequate facilities	55.0	25.3	7.82	Reject Ho — significant
Adequate equipment	62.5	27.0	7.82	Reject Ho — significant

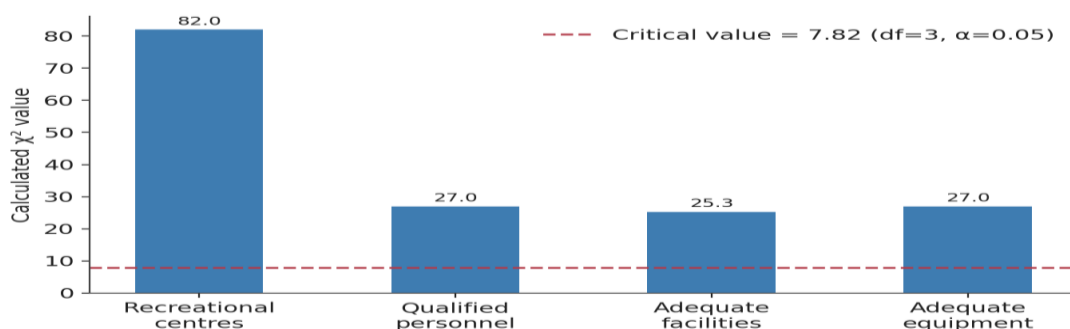


Figure 2: Calculated χ^2 values for determinants of recreational pursuit against the critical value, Atisbo secondary school students (n = 200).

All four hypotheses were rejected (Table 3, Figure 2): recreational centres, qualified personnel, facilities and equipment each significantly influence recreational pursuit among Atisbo secondary school students, with the provision of recreational centres showing the strongest effect ($\chi^2 = 82.0$). The school-based finding replicates a familiar pattern in Nigerian physical-education research: recreational participation tracks the availability of centres, trained staff, facilities and equipment [11-13], and is shaped by how well instructional objectives are matched to the operating environment in which they are delivered [14]. Read alongside the community climate data (Table 1, Figure 1), however, a second layer of constraint becomes visible. Roughly two in three Atisbo residents already perceive more frequent hot weather and heat waves as a significant, statistically confirmed change in their local environment. For a student population whose recreational pursuit is already limited by scarce centres, personnel, facilities and equipment, a warming trend does not operate on a neutral backdrop - it narrows the comfortable hours and conditions within which the

already-limited infrastructure can safely be used, particularly for unshaded outdoor facilities of the kind most schools in the LGA are likely to rely on.

This reading is consistent with a growing international evidence base linking rising temperature directly to reduced youth outdoor activity time [4, 5] and with the mounting number of extreme-heat school-sport days documented across warming climates in recent years [15, 16]. Nigerian studies of recreational-facility availability report similar infrastructural gaps in other states and institutions [6, 7, 8, 17], and attitudinal research suggests that even where facilities exist, awareness and institutional support for recreation remain uneven [18]. Emerging policy responses elsewhere such as state-level rules restricting outdoor physical education during extreme-heat days [19, 20] offer a template that Atisbo LGA could adapt at comparatively low cost relative to full infrastructural investment. The case for treating climate as a recreation-policy variable is reinforced by WHO's own health-argument framing of climate action [21] and by earlier Nigerian evidence that heat-related health risk is already measurable in the country's climate-health burden [9].

Set against six directly comparable prior studies, the present findings (Tables 1 - 3, Figures 1 and 2) extend rather than merely replicate the existing evidence. Koepp et al. found that each 1°C rise in ambient temperature measurably reduced preschoolers' outdoor activity time in a US sample [4], and Lanza et al. similarly linked schoolyard temperature and shade cover to reduced recess activity among US children [5] — both establish the temperature-activity link this study extends to a Nigerian secondary-school population. Agbabiaka, Doguwa and Ukpong [6] and Diejomaoh, Akatah and Tayire [7] each found facility scarcity to be the dominant constraint on Nigerian recreational participation, a pattern this study's $\chi^2 = 82.0$ finding for recreational centres closely mirrors.

Adeyemo [8] reported a similarly facility-driven recreational pattern among Ekiti State tertiary students, while Kampf, Haines and Gambino revealed that renovated recreation centres measurably increased participation in a US collegiate setting [17], together supporting this study's finding that centre provision is the strongest single determinant of recreational pursuit in Atisbo LGA. None of these six studies, however, examined climate perception and recreational-infrastructure adequacy together within the same population, which is the comparative contribution of the present study.

CONCLUSION

This study met its objective of testing, within a single LGA, whether a warming local climate and constrained recreational infrastructure jointly shape secondary school students' opportunity for outdoor recreation. Atisbo residents significantly perceive heat waves as an effect of global warming, and recreational centres, personnel, facilities and equipment all significantly influence students' recreational pursuit; read together, these results indicate that resourcing and climate are complementary, not separate, constraints on youth recreation in the LGA. It is recommended that government provide adequate recreational centres, facilities and equipment to support recreational pursuit in Atisbo LGA; that a recreation agency be established or strengthened to raise recreational awareness among students; that sufficient qualified personnel be appointed to superintend recreational activities in secondary schools; that a national policy on recreation administration be developed to guide recreational pursuit for students; and that school authorities schedule outdoor physical education and recreational sessions to avoid peak-heat hours identified through local climate monitoring.

This study has three main limitations. First, the community-perception and school-based datasets were collected from different respondent groups (adults and students) using separately administered instruments, so the link drawn between rising heat exposure and constrained recreational pursuit is an interpretive synthesis of two independent datasets rather than a finding from a single integrated model with student-level heat-exposure and participation measures.

Second, heat and climate conditions were assessed through resident perception rather than objective meteorological or heat-index data for the specific school compounds studied. Third, the cross-sectional design captures perception and infrastructure adequacy at a single point in time and cannot establish how either is changing over successive years.

Future research should collect heat-exposure and recreational-participation data from the same student respondents, ideally paired with objective heat-index measurements for school compounds, to test directly whether local warming moderates the effect of recreational infrastructure on participation, and should extend this comparative design to other Nigerian LGAs to establish whether the pattern observed in Atisbo generalises regionally.

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APPENDIX A

SURVEY INSTRUMENTS

Two structured instruments were administered: Instrument 1 to adult residents of Atisbo LGA, and Instrument 2 to secondary school students in the four sampled schools.

Instrument 1: Community Heat/Climate Perception Questionnaire

Section A: Demographic Data

1. Sex: Male () Female ()
2. Age range: _____
3. Community of residence: _____

Section B: Heat/Climate Perception (SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree)

4. Frequent hot weather is a result of global warming. SA () A () D () SD ()
5. Global warming has significantly contributed to heat waves. SA () A () D () SD ()
6. Unfavourable climate conditions have been experienced due to warming. SA () A () D () SD ()

Instrument 2: Recreational Pursuit Questionnaire

Section A: Demographic Data

1. Sex: Male () Female ()
2. Class/Level: _____
3. School: _____

Section B: Determinants of Recreational Pursuit (SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree)

4. The provision of recreational centres influences my recreational pursuit. SA () A () D () SD ()
5. The provision of qualified personnel influences my recreational pursuit. SA () A () D () SD ()
6. Adequate facilities influence my recreational pursuit. SA () A () D () SD ()
7. Adequate equipment influences my recreational pursuit. SA () A () D () SD ()