

Relationship Between Outdoor Adventure Education Programs and Environmental Sustainability Behaviors Among Youths in Ondo State, Nigeria

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[Doi:10.19044/esj.2026.v22n7p132](https://doi.org/10.19044/esj.2026.v22n7p132)

Submitted: 05 January 2026

Accepted: 15 March 2026

Published: 31 March 2026

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Cite As:

Ojo, B.D., & Arowosafe, F.C. (2026). *Relationship Between Outdoor Adventure Education Programs and Environmental Sustainability Behaviors Among Youths in Ondo State, Nigeria*. European Scientific Journal, ESJ, 22 (7), 132. <https://doi.org/10.19044/esj.2026.v22n7p132>

Abstract

This study examined the relationship between outdoor adventure education (OAE) programs and environmental sustainability behaviors among 360 youths in Ondo State, Nigeria (63.6% male, 36.4% female; 70.5% aged 18-34; Yoruba, with low-to-middle income and secondary/higher education). Using a correlational survey design and self-report questionnaire data collection across amusement parks, recreation, sports, and tourism, the study revealed a significant positive relationship between participation in these programs and sustainability behaviors among youths. Mean ratings across contexts ranged from 2.76 to 3.04, indicating consistent agreement. Statistical analysis further showed significant correlations between OAE context: amusement park ($r = .660$), recreation ($r = .515$), sports ($r = .832$), tourism ($r = .703$), and environmental sustainability behaviors among youths ($p < .05$). Regression analysis showed these contexts jointly explain 30.2% of variance in sustainability behaviors ($R = .302$, $F = 38.85$, $p < .001$). The findings

recommend integrating environmental education into youth programs across these sectors.

Keywords: OAE programs; Environmental sustainability; Pro-environmental behaviors; Youths; Nigeria; Amusement parks; Sports

Introduction

Outdoor adventure education (OAE) is a pedagogical approach that combines experiential learning and adventure-based activities in natural environments to promote personal growth, environmental awareness, and sustainable behaviors. It often involves structured programs to foster critical life skills such as teamwork, resilience, and problem-solving while developing an understanding of ecological systems and sustainability (Brymer et al., 2019). Outdoor learning has the potential to improve social, emotional, and cognitive development, especially among youth, who are at a critical stage of forming behavioral patterns (Molyneux et al., 2023). Nigeria faces numerous environmental challenges, including deforestation, pollution, urbanization, and biodiversity loss. Urbanization and industrial activities further contribute to air and water pollution, affecting public health and reducing the quality of life in urban and rural areas (Dipeolu et al., 2020).

Furthermore, poor waste management practices, including the improper disposal of plastics and hazardous materials, have contributed to soil and water contamination, posing risks to both human and environmental health (Maingi et al., 2021). These challenges are compounded by a lack of awareness and participation in sustainability practices among youth. This is partly due to insufficient exposure to practical, hands-on environmental education programs that emphasize sustainability (Ngobua *et al.*, 2021). However, observations suggest that many young Nigerians lack the awareness and skills necessary to address environmental challenges effectively (Fyfe-Johnson *et al.*, 2021).

OAE programs have been identified as effective tools for fostering environmental awareness and sustainability behaviors among youth. By engaging in outdoor activities, young participants develop a sense of responsibility for nature and an understanding of the ecological consequences of their actions (Pomohaci et al., 2018). Outdoor education programs, which emphasize experiential learning, have proven effective in embedding these principles among youth (Kuo *et al.*, 2019).

In Nigeria, where over 60% of the population is under 30, the youth demographic holds immense potential for driving sustainability initiatives (Oyeleke & Bakare, 2020). Their active participation in OAE programs has been linked to increased environmental awareness and advocacy for conservation policies. Moreover, youth are not only participants but also

catalysts for change. Their unique perspective allows them to identify and address gaps in existing sustainability strategies (Dipeolu *et al.*, 2020). According to Eigenschenk *et al.* (2019), outdoor settings such as parks, recreation areas, sports fields, and tourism destinations provide unique opportunities for environmental education. Parks, for example, serve as natural laboratories where participants can observe ecosystems and learn about conservation firsthand. Recreational activities like hiking and camping offer experiential learning opportunities that deepen participants' connection to nature.

Sports and tourism also play a crucial role in OAE. Sporting activities such as cycling or kayaking can be designed to emphasize environmental stewardship, teaching participants about the importance of protecting natural resources (Ogunsemere, 2019). Similarly, eco-tourism initiatives allow individuals to explore natural habitats while learning about sustainable practices and the need for conservation (Jamieson & Ostermeyer, 2017). Despite their potential, these platforms are underutilized in Nigeria. Poor maintenance of recreational and sporting facilities, limited funding for parks, and unregulated tourism practices hinder their effectiveness as tools for environmental education (Ngobua *et al.*, 2021).

Research by Wang *et al.* (2023) demonstrates that outdoor activities significantly reduce screen time among adolescents, promoting healthier lifestyles and greater environmental consciousness. Similarly, studies by Ayaga and Okaya (2020) highlight the role of outdoor education in enhancing students' understanding of ecological interdependencies and their commitment to sustainability. In Nigeria, OAE programs have been successfully implemented in schools and community settings, providing youth with practical skills for environmental conservation (Odekunle *et al.*, 2022). These programs emphasize collaborative learning, where participants work together to solve real-world environmental problems, fostering teamwork and a shared sense of responsibility. The integration of sustainability principles into outdoor education programs has also been linked to improved academic performance and social skills among participants. For example, Olajide *et al.* (2017) found that students who participated in outdoor learning activities demonstrated higher levels of environmental literacy and critical thinking. This underscores the potential of outdoor settings to serve as holistic platforms for personal and social development.

OAE programs have garnered increasing attention worldwide due to their multifaceted benefits for personal development, academic growth, and sustainable behaviors. These programs integrate experiential learning in nature, nurturing critical thinking, teamwork, and environmental consciousness, which are instrumental in promoting sustainable behaviors (Brymer *et al.*, 2019).

In Nigeria, the concept of OAE is largely unexplored, despite its potential to address the country's pressing environmental challenges. Youth engagement in structured OAE programs remains limited, with most recreational activities revolving around informal sports or unstructured leisure (Oyeleke & Bakare, 2020). While programs in other nations link outdoor activities with sustainability goals, Nigeria's initiatives rarely incorporate this crucial dimension (Ngobua *et al.*, 2021). This absence is particularly concerning given Nigeria's vulnerability to environmental degradation, deforestation, and climate change (Dipeolu, Ibem, & Fadamiro, 2020).

Despite the growing recognition of outdoor learning as a tool for promoting sustainability, there is a paucity of research on its application and effectiveness in Nigeria. Existing studies predominantly focus on the recreational or health benefits of outdoor activities, neglecting their potential role in fostering environmental behaviors. Furthermore, while international research highlights the transformative role of OAE in shaping pro-environmental attitudes, similar studies in Nigeria remain scarce. The lack of data on Nigerian youth's engagement with nature and its influence on their environmental behaviors limits the development of targeted interventions.

With a significant proportion of the population under 30 years old, engaging youth in environmental education is vital for fostering a generation of sustainability advocates (Jamieson & Ostermeyer, 2017). However, the limited availability of structured outdoor learning opportunities restricts their exposure to nature, reducing their likelihood of adopting pro-environmental practices.

Research Questions

The following research questions are raised in this study:

1. What are participants' perceptions of the relationship between OAE programs in amusement parks and environmental sustainability behaviors among youth?
2. What are participants' perceptions of the relationship between OAE programs in recreation and environmental sustainability behaviors among youth?
3. What are participants' perceptions of the relationship between OAE programs in sports and environmental sustainability behaviors among youth?
4. What are participants' perceptions of the relationship between OAE programs in tourism and environmental sustainability behaviors among youth?

Research Hypotheses (H0):

- **H11:** Participants perceive a positive relationship between OAE programs in amusement parks and environmental sustainability behaviors among youth.
- **H12:** Participants perceive a positive relationship between OAE programs in recreation and environmental sustainability behaviors among youth.
- **H13:** Participants perceive a positive relationship between OAE programs in sports and environmental sustainability behaviors among youth.
- **H14:** Participants perceive a positive relationship between OAE programs in tourism and environmental sustainability behaviors among youth.
- **H15:** Participants perceive relative contribution from all four OAE contexts to environmental sustainability behaviors among youth.
- **H16:** Participants perceive joint contributions from all four OAE contexts to environmental sustainability behaviors among youth.

Methodology

Study Area

Ondo State, located in the southwestern region of Nigeria, has a land area of 15,500 km² and a population exceeding 5 million. The state is characterized by diverse topography, including lowland rainforest zones in the south and central regions and the undulating highlands in the northern parts. Notably, the Idanre Hills are a UNESCO-recognized tourist site (>900 m elevation). Ondo State experiences a tropical rainforest climate, with two distinct seasons: the rainy season (April to October) and the dry season (November to March).

Ondo State has numerous recreational parks, sports complexes, and tourist centers, making it an ideal location for studying OAE programs. Sites like the Idanre Hills Tourist Centre, Manuex Amusement Park, Akure Recreational Club, and FUTA Sports Complex make it a suitable location for studying OAE programs on youth sustainability behaviors.

Ethical Statement

The study “Impact of Outdoor Adventure Education Programs on Environmental Sustainability Behaviors among Youths in Ondo State, Nigeria” was reviewed and approved by the Ethics Committee of the School of Agriculture and Agricultural Technology (SAAT), Federal University of Technology, Akure, Nigeria. All participants were informed about the study's purpose and procedures and provided voluntary informed consent before participating.

Research Design

The research approach used in this study was a descriptive survey to examine the relationship between OAE programs and environmental sustainability behaviors among youth.

Participants and Demographics

The target population comprised youth visitors to 12 purposively selected organizations (three each from amusement parks, recreation, sports, and tourism) in Ondo State. Using Yamane's formula for a finite population (1967) at 5% margin of error, a sample of 360 respondents was drawn via proportionate stratified random sampling (30 per site).

The sample (N=360) comprised 229 males (63.6%) and 131 females (36.4%). The majority (70.5%) were under age 34, with 36.9% aged 18-24 and 33.6% aged 25-34. For this study, youth were identified as individuals aged 18-34 years, consistent with national categorizations of young people in Nigeria. Participants above this age range (29.5%) were also included because they were actively engaged in OAE programs at the selected locations; their responses were retained to reflect the actual population. Most respondents were single (43.1%) or married (39.7%). Income was predominantly low to middle (27.5% earned below #50,000 monthly). Educational attainment was diverse: 26.4% secondary education, 21.4% bachelor's degree, 19.7% diploma/technical, and 14.7% master's or higher. The sample was predominantly Yoruba (65.6%), with Igbo (26.9%) and Hausa (7.5%) minorities, reflecting the state's ethnic composition.

Literature Justification for Design

The descriptive survey design is appropriate for exploratory assessments of experiential program's effects on behaviors, as confirmed by studies on youth environments (Kuo et al., 2019; Eigenschenk et al., 2019). Stratified sampling guarantees representation across OAE contexts (Brymer et al., 2019), while Pearson correlation/regression tests associations for self-reported data (Creswell & Creswell, 2018).

Population, Sample, and Sampling Technique

- **Stage 1:** Four categories of organizations were identified: amusement parks, sports, recreation, and tourism.
- **Stage 2:** To ensure equal representation across OAE contexts, three organizations were selected from each category (a total of 12 organizations), using stratified sampling.
- **Stage 3:** Since the total visitor population of the selected organizations is unknown, a proportionate stratified random sampling technique was used to determine the sample size and ensure fair representation across

all twelve (12) organizations. Using Yamane’s formula for unknown population size, a sample size of 360 respondents was determined (margin of error:5%), with 30 respondents per organization.

Table 1 presents the distribution of 360 respondents across the 12 selected organizations.

Table 1: Distribution of the Sample

S/N	Category	Number of selected organizations	Respondents per organization	Total respondents per category
1-3	Amusement parks	3	30	90
4-6	Sports	3	30	90
7-9	Recreation	3	30	90
10-12	Tourism	3	30	90
Total	All Categories	12	30	360

Research Instrument

The instrument used to gather data for this study was a well-structured questionnaire titled “OAE Programs and Environmental Sustainability Behaviors Questionnaire (OAEPLESBQ)”. Five (5) sections made up the subdivided questionnaire (A, B, C, D, and E). Section A had the respondents' demographic information, including their age, gender, marital status, income, education, and tribe. Section B-E measured the correlation of the relationship between OAE programs in amusement parks, recreation, sports, and tourism, respectively, and environmental sustainability behaviors among youths.

Each portion of the instrument used a four-point scale: Strongly Disagree (SD), Agree (A), Disagree (D), and Strongly Agree (SD).

Validation of the Instrument

The researcher's supervisor examined each item in the study instrument to ensure that it aligned with the research questions and hypotheses, a process known as face and content validity. Prominent academics also verified the questionnaire further. After all necessary modifications were completed, the final version was used to gather data.

Reliability of the Instrument

A pilot test was carried out using a subset of respondents who were not part of the primary research and copies of the questionnaire. Upon retrieval, the administered questionnaires were divided into two groups: even and odd numbers. The OAE was examined using Cronbach’s alpha, which is widely recommended for reliability assessment of multi-item scales in survey research (Creswell & Creswell, 2018). The reliability of the instrument was

assessed and determined by the reliability coefficient to indicate if the instrument was reliable within an acceptable limit. The overall scale yielded a Cronbach’s alpha coefficient of 0.82, indicating acceptable reliability for survey research.

Procedure for Data Collection

To help with the questionnaire distribution, a letter of introduction was submitted, which introduced the researcher to the respondents. The questionnaires were distributed to the respondents with the assistance of six (6) skilled research assistants. To guarantee a high rate of return, the researcher and research assistants collected all 360 copies of the complete questionnaire from the respondents once it was finished. Before being analyzed, the copies of the questionnaire were coded.

Procedure for Data Analysis

The data gathered was subjected to descriptive statistics (frequency counts, percentage, mean, and standard deviation), Pearson’s correlation, and multiple regression. Descriptive statistics (frequency counts and percentages) were used to analyze the demographic data of the respondents; descriptive statistics (mean and standard deviation) were used to analyze the research questions, while Pearson’s correlation and multiple regression were used to inferentially test hypotheses at the 0.05 level of significance, using Statistical Package for Social Science (SPSS) version 26.

Results

This study utilizes self-reported questionnaire data to evaluate participants' perceptions and beliefs about how OAE programs relate to environmental sustainability behaviors. Results are based on subjective associations rather than objective behavioral measures or causal effects.

Research Question 1: What are participants’ perceptions of the relationship between OAE programs in amusement parks and environmental sustainability behaviors among youth?

Table 2 reveals respondents’ mean ratings for the items measuring perceived relationships between OAE programs in amusement parks and sustainability behaviors among youth.

Table 2: Descriptive Analysis of Research Question 1

S/N	Items	SA (Freq. %)	A (Freq. %)	D (Freq. %)	SD (Freq. %)	Mean	Std. Dev.
1	Engaging in outdoor adventure activities helps Nigerian youths develop skills for sustainable living.	130 (36.1%)	95 (26.4%)	77 (21.4%)	58 (16.1%)	2.82	1.09

2	National park-based education programs significantly influence youths' attitudes toward waste management and recycling.	125 (34.7%)	99 (27.5%)	78 (21.7%)	58 (16.1%)	2.81	1.08
3	Hands-on learning experiences in Amusement parks improve youths' understanding of climate change and its impacts.	123 (34.2%)	101 (28.1%)	80 (22.2%)	56 (15.6%)	2.81	1.07
4	Participation in outdoor adventure activities fosters a sense of responsibility for protecting natural resources.	122 (33.9%)	100 (27.8%)	82 (22.8%)	56 (15.6%)	2.80	1.07
5	OAE programs encourage Nigerian youths to adopt eco-friendly practices in their daily lives.	126 (35.0%)	98 (27.2%)	75 (20.8%)	61 (16.9%)	2.80	1.09
6	Exposure to nature through adventure programs strengthens youths' commitment to biodiversity conservation.	120 (33.3%)	102 (28.3%)	79 (21.9%)	59 (16.4%)	2.79	1.08
7	Implementation of OAE in Amusement parks increases youths' advocacy for environmental policies.	119 (33.1%)	103 (28.6%)	81 (22.5%)	57 (15.8%)	2.79	1.07
8	Amusement parks provide an ideal setting for experiential learning that promotes sustainable environmental behaviors.	118 (32.8%)	104 (28.9%)	78 (21.7%)	60 (16.7%)	2.78	1.08
9	Outdoor adventure programs create lifelong environmental stewardship among participants.	121 (33.6%)	97 (26.9%)	79 (21.9%)	63 (17.5%)	2.77	1.10
10	OAE programs in Amusement parks enhance youths' awareness of environmental conservation.	115 (31.9%)	105 (29.2%)	80 (22.2%)	60 (16.7%)	2.76	1.07
Average Mean						2.79	1.08

Decision rule: It has been adjudged that a criterion mean score of 2.50 and above is significant.

Note. SA = Strongly agree; A = Agree; D = Disagree; SD = Strongly disagree

Table 2 reveals the descriptive analysis of respondents' self-reported perceptions of the relationship between OAE programs in amusement parks and environmental sustainability behaviors among youths. The result showed that most respondents strongly agreed across most of the items, with mean Result showed that most respondents strongly agreed and agreed across most of the items, with mean scores ranging from 2.76 to 2.82. For instance, respondents affirmed that engaging in outdoor adventure activities helps Nigerian youths develop skills for sustainable living ($\bar{x} = 2.82$) and that national park-based education programs significantly influence attitudes toward waste management and recycling ($\bar{x} = 2.81$). Similarly, hands-on learning experiences in amusement parks were perceived to improve understanding of climate change and its impacts ($\bar{x} = 2.81$).

These consistently high mean values, above the set criterion of 2.50, indicate that respondents perceive a strong relationship between OAE programs in amusement parks and the development of long-term environmental sustainability behaviors among youths.

Research Question 2: What are participants’ perceptions of the relationship between OAE programs in recreation and environmental sustainability behaviors among youth?

Table 3 reveals respondents’ mean ratings for the items measuring perceived relationships between OAE programs in recreation and sustainability behaviors among youth.

Table 3: Descriptive Analysis of Research Question 2

S/N	Items	SA (Freq. %)	A (Freq. %)	D (Freq. %)	SD (Freq. %)	Mean	Std. Dev.
11	Implementing OAE in recreational spaces cultivates environmental stewardship among Nigerian youths.	148 (41.1%)	122 (33.9%)	52 (14.4%)	38 (10.6%)	3.06	0.99
12	Recreational adventure programs promote eco-friendly habits such as reducing waste and minimizing pollution.	147 (40.8%)	121 (33.6%)	55 (15.3%)	37 (10.3%)	3.05	0.99
13	OAE programs in recreational settings help instill a culture of environmental responsibility among Nigerian youths.	145 (40.3%)	123 (34.2%)	53 (14.7%)	39 (10.8%)	3.04	0.98
14	Engaging in outdoor recreation activities increases youths’ awareness of the need for environmental conservation.	141 (39.2%)	129 (35.8%)	54 (15.0%)	36 (10.0%)	3.04	0.97
15	Implementing outdoor education programs in recreational spaces enhances youths’ understanding of the importance of biodiversity.	143 (39.7%)	125 (34.7%)	56 (15.6%)	36 (10.0%)	3.04	0.98
16	Recreational outdoor programs improve youths’ attitudes toward responsible land and water use.	144 (40.0%)	124 (34.4%)	54 (15.0%)	38 (10.6%)	3.04	0.98
17	Outdoor adventure experiences in recreational areas encourage Nigerian youths to engage in environmental advocacy.	137 (38.1%)	133 (36.9%)	53 (14.7%)	37 (10.3%)	3.03	0.97
18	Participation in outdoor recreation activities strengthens commitment to sustainable tourism practices.	142 (39.4%)	126 (35.0%)	54 (15.0%)	38 (10.6%)	3.03	0.98
19	Adventure-based recreational education fosters teamwork and leadership in addressing environmental challenges.	139 (38.6%)	127 (35.3%)	56 (15.6%)	38 (10.6%)	3.02	0.98
20	Participation in recreational adventure activities fosters a deeper connection with nature, leading to more sustainable behaviors.	139 (38.6%)	127 (35.3%)	55 (15.3%)	39 (10.8%)	3.02	0.97
Average Mean						3.04	0.98

Decision rule: It has been adjudged that a criterion mean score of 2.50 and above is significant.

Note. SA = Strongly agree; A = Agree; D = Disagree; SD = Strongly disagree

Table 3 shows the descriptive analysis of responses on the relationship between OAE programs in recreational spaces and environmental sustainability behaviors among Nigerian youths. The result indicates that most respondents agreed that OAE programs in recreation enhance environmental consciousness. Specifically, most participants agreed that these programs help instill a culture of environmental responsibility ($\bar{x} = 3.04$); foster a deeper connection with nature, which leads to sustainable behaviors ($\bar{x} = 3.02$); increase awareness of the need for conservation ($\bar{x} = 3.04$); and promote eco-friendly habits like waste reduction and pollution control ($\bar{x} = 3.05$).

Further, respondents acknowledged that outdoor educational programs improve understanding of biodiversity ($\bar{x} = 3.04$); encourage environmental advocacy ($\bar{x} = 3.03$); and strengthen attitudes toward responsible land and water use ($\bar{x} = 3.04$). Adventure-based recreation was also seen as fostering teamwork and leadership for addressing environmental challenges ($\bar{x} = 3.02$). Youths reported enhanced commitment to sustainable tourism practices ($\bar{x} = 3.03$) and long-term environmental stewardship ($\bar{x} = 3.06$). Hence, the average mean score of 3.04, which is above the decision benchmark of 2.50, suggests that OAE programs in recreational settings have a significant positive relationship with promoting environmental sustainability behaviors among Nigerian youths.

Research Question 3: What are participants’ perceptions of the relationship between OAE programs in sports and environmental sustainability behaviors among youth?

Table 4 reveals respondents’ mean ratings for the items measuring perceived relationships between OAE programs in sports and sustainability behaviors among youth.

Table 4: Descriptive Analysis of Research Question 3

S/N	Items	SA (Freq. %)	A (Freq. %)	D (Freq. %)	SD (Freq. %)	Mean	Std. Dev.
21	Integrating environmental education into outdoor sports programs increases awareness of climate change and its impact on recreational spaces.	109 (30.3%)	119 (33.1%)	81 (22.5%)	51 (14.2%)	2.79	1.04
22	OAE programs in sports help Nigerian youths develop a sense of responsibility toward environmental conservation.	103 (28.6%)	127 (35.3%)	75 (20.8%)	55 (15.3%)	2.77	1.04
23	Participation in outdoor sports activities encourages youths to adopt sustainable practices such as waste reduction and proper disposal.	97 (26.9%)	131 (36.4%)	79 (21.9%)	53 (14.7%)	2.76	1.03
24	Engaging in outdoor sports enhances youths’ appreciation for nature and	101 (28.1%)	123 (34.2%)	85 (23.6%)	51 (14.2%)	2.76	1.03

	motivates them to protect natural resources.						
25	Implementing outdoor education in sports programs fosters a commitment to environmental stewardship.	107 (29.7%)	113 (31.4%)	89 (24.7%)	51 (14.2%)	2.76	1.03
26	Outdoor sports activities provide opportunities for practical learning about biodiversity and ecosystem preservation.	105 (29.2%)	117 (32.5%)	83 (23.1%)	55 (15.3%)	2.75	1.04
27	Exposure to sustainable outdoor sports programs influences Nigerian youths to advocate for green policies and conservation initiatives.	103 (28.6%)	121 (33.6%)	81 (22.5%)	55 (15.3%)	2.75	1.04
28	Adventure-based sports activities encourage participants to minimize their ecological footprint by using eco-friendly equipment and practices.	99 (27.5%)	121 (33.6%)	87 (24.2%)	53 (14.7%)	2.74	1.03
29	OAE in sports instills ethical values related to environmental sustainability and responsible recreation.	99 (27.5%)	125 (34.7%)	79 (21.9%)	57 (15.8%)	2.74	1.04
30	Outdoor adventure sports promote teamwork and leadership in addressing environmental challenges within communities.	95 (26.4%)	125 (34.7%)	83 (23.1%)	57 (15.8%)	2.72	1.05
Average Mean						2.76	1.037

Decision rule: It has been adjudged that a criterion mean score of 2.50 and above is significant.

Note. SA = Strongly agree; A = Agree; D = Disagree; SD = Strongly disagree

Table 4 shows the descriptive analysis of the relationship between OAE programs in sports and environmental sustainability behaviors among Nigerian youths. Results reveal that most of the respondents agreed that OAE fosters responsible environmental behavior.

For example, many participants affirmed that such programs help Nigerian youths develop a sense of responsibility toward environmental conservation ($\bar{x} = 2.77$). Participation in outdoor sports was also perceived to encourage sustainable practices like waste reduction and proper disposal ($\bar{x} = 2.76$). Respondents agreed that integrating environmental education into sports activities increases awareness of climate change and its effect on recreational spaces ($\bar{x} = 2.79$). Similarly, outdoor sports were acknowledged for promoting teamwork and leadership in addressing environmental challenges within communities ($\bar{x} = 2.72$), and for enhancing youths' appreciation for nature ($\bar{x} = 2.76$). Other responses pointed out the role of adventure-based sports in encouraging ecological responsibility using eco-friendly equipment ($\bar{x} = 2.74$) and fostering long-term environmental stewardship ($\bar{x} = 2.76$).

With an average mean score of 2.76, which is above the criterion mean of 2.50, the result suggests that respondents generally perceive a positive relationship between OAE programs and long-term environmental sustainability behaviors among youth.

Research Question 4: What are participants’ perceptions of the relationship between OAE programs in tourism and environmental sustainability behaviors among youth?

Table 5 reveals respondents’ mean ratings for the items measuring perceived relationships between OAE programs in tourism and sustainability behaviors among youth.

Table 5: Descriptive Analysis of Research Question 4

S/ N	Items	SA (Freq. %)	A (Freq. %)	D (Freq. %)	SD (Freq. %)	Mean	Std. Dev.
31	Participation in eco-tourism activities through outdoor education fosters responsible tourism behaviors, such as reducing waste and respecting wildlife.	111 (30.8%)	121 (33.6%)	75 (20.8%)	53 (14.7%)	2.81	1.03
32	Participation in outdoor adventure tourism helps youths recognize the impact of human activities on fragile ecosystems.	112 (31.1%)	117 (32.5%)	77 (21.4%)	54 (15.0%)	2.80	1.03
33	Implementing OAE in tourism cultivates environmentally responsible behaviors among Nigerian youths.	109 (30.3%)	120 (33.3%)	77 (21.4%)	54 (15.0%)	2.80	1.03
34	Outdoor adventure tourism programs encourage local communities to adopt conservation efforts and eco-friendly tourism policies.	113 (31.4%)	115 (31.9%)	77 (21.4%)	55 (15.3%)	2.79	1.05
35	Exposure to sustainable tourism practices through outdoor education influences youths advocating for environmental protection in their communities.	108 (30.0%)	120 (33.3%)	77 (21.4%)	55 (15.3%)	2.78	1.04
36	Adventure tourism programs provide hands-on learning experiences that strengthen youths’ understanding of sustainable resource management.	110 (30.6%)	116 (32.2%)	79 (21.9%)	55 (15.3%)	2.78	1.04
37	Outdoor education programs in tourism encourage the use of sustainable materials and eco-friendly infrastructure in tourism activities.	108 (30.0%)	119 (33.1%)	79 (21.9%)	54 (15.0%)	2.78	1.03
38	OAE programs in tourism help Nigerian youths develop a deeper appreciation for natural landscapes and biodiversity.	109 (30.3%)	117 (32.5%)	79 (21.9%)	55 (15.3%)	2.78	1.04
39	Adventure-based tourism programs teach youths sustainable practices, such as minimizing their carbon footprint while traveling.	107 (29.7%)	119 (33.1%)	79 (21.9%)	55 (15.3%)	2.77	1.04
40	OAE in tourism promotes ethical travel habits, such as respecting local cultures and protecting natural heritage sites.	106 (29.4%)	118 (32.8%)	81 (22.5%)	55 (15.3%)	2.76	1.04
Average Mean						2.79	1.037

Decision rule: It has been adjudged that criterion mean score of 2.50 and above is significant.

Note. SA = Strongly agree; A = Agree; D = Disagree; SD = Strongly disagree

Table 5 shows the descriptive analysis of the relationship between OAE programs in tourism and environmental sustainability behaviors among Nigerian youths. The result revealed that a significant number of respondents affirmed the impact of outdoor tourism-based education on fostering sustainable behaviors. Many agreed that OAE helps Nigerian youths develop a deeper appreciation for natural landscapes and biodiversity ($\bar{x} = 2.78$). Similarly, participation in eco-tourism activities was seen to foster responsible tourism behaviors such as reducing waste and respecting wildlife ($\bar{x} = 2.81$). Adventure-based tourism programs were also recognized for teaching youths' sustainable practices like minimizing their carbon footprint while traveling ($\bar{x} = 2.77$). Additionally, outdoor adventure tourism programs were perceived as encouraging both local communities and youths to adopt conservation efforts and eco-friendly policies ($\bar{x} = 2.79$). Exposure to sustainable tourism practices was noted to influence advocacy for environmental protection ($\bar{x} = 2.78$), while OAE was seen as promoting ethical travel habits ($\bar{x} = 2.76$).

Respondents further acknowledged that adventure tourism programs offer hands-on learning experiences that enhance understanding of sustainable resource management ($\bar{x} = 2.78$) and help youths recognize the impact of human activities on fragile ecosystems ($\bar{x} = 2.80$). Outdoor education programs were also credited for encouraging the use of sustainable materials in tourism activities ($\bar{x} = 2.78$) and for cultivating long-term environmentally responsible behaviours ($\bar{x} = 2.80$).

Hypothesis Testing

Hypotheses 1-4: Correlation Analysis

Pearson correlation analysis examined relationships between each OAE context and environmental sustainability behaviors (Table 6). Table 6 reveals Pearson correlation coefficients between each OAE program and environmental sustainability behaviors among youth.

Table 6: Pearson Correlation Analysis of OAE Contexts and Environmental Sustainability

OAE Context	r	p	Decision
Amusement Parks	.660	.011	Reject H0 ₁
Recreation	.515	.005	Reject H0 ₂
Sports	.832	.012	Reject H0 ₃
Tourism	.703	.001	Reject H0 ₄

All four OAE contexts showed statistically significant positive correlations with environmental sustainability behaviors. Sports demonstrated the strongest correlation ($r = .832$), followed by tourism ($r = .703$), amusement parks ($r = .660$), and recreation ($r = .515$). All correlations were significant at $p < .05$. This implies that each of the outdoor activities (amusement parks, recreation, sports, and tourism) plays a significant role in helping youths act in ways that protect the environment.

Hypotheses 5-6: Multiple Regression Analysis

Table 7 reveals multiple regression results on the relative and joint contributions of all four OAE programs.

Table 7: Multiple Regression Analysis: Relative Contributions of OAE Contexts

Predictor	B	SE	t-value	p
Amusement Parks	.405	.062	6.532	.001
Recreation	0.297	.055	5.400	.020
Sports	0.552	.060	9.200	.000
Tourism	0.493	.058	8.186	.003
Constant	3.322	.145	22.928	.000

Note: $R^2=.299$; $F(4,355) = 38.85$; $p < .001$

Regression Model Summary Analysis

R	R ²	Adjusted R ²	F	p-value	St. Error
.547	.299	.293	34.258	.000	.64521

The regression model was statistically significant ($F = 34.258$; $p < .000$) and explained 29.9% of variance in environmental sustainability behaviors ($R^2=.299$). Sports had the largest standardized contribution ($\beta=.552$), tourism ($\beta=.493$), amusement parks ($\beta=.405$), and recreation ($\beta=.297$). All predictors were statistically significant at $p < .05$, showing that each OAE context independently and jointly contributes to environmental sustainability behaviors.

Discussion

The study showed that youths perceive a strong relationship between OAE programs in amusement parks and the development of environmental sustainability behaviors among youths, i.e., engaging in outdoor adventure activities helps Nigerian youths develop skills for sustainable living. Given the self-report design, the results suggest perceived relationships between OAE contests and sustainability beliefs, which warrant longitudinal studies to assess actual behavioral change. This finding aligns with the study of Kuo *et al.* (2019), who asserted that OAE programs integrated into recreational activities promote a deeper connection to nature, resulting in enduring pro-environmental attitudes and behaviors among young people. Similarly, this finding is supported by the research of Oyeleke and Bakare (2020), who observed that in the Nigerian context, youths exposed to outdoor educational experiences within recreational spaces tend to develop stronger environmental advocacy behaviors and demonstrate more conscious efforts toward sustainable living compared to their peers who lack such exposure. The study revealed that respondents generally perceive a positive relationship between OAE programs and environmental sustainability behaviors among young people.

The study showed that respondents generally believe OAE programs in tourism positively shape environmental sustainability behaviors among Nigerian youths, i.e., participation in eco-tourism activities through outdoor education fosters responsible tourism behaviors, such as reducing waste and respecting wildlife. This finding aligns with the study by Jamieson and Ostermeyer (2017), who asserted that eco-tourism, as an outdoor educational tool, is highly effective in nurturing environmentally responsible behaviors among young tourists, particularly through structured programs that emphasize respect for wildlife and waste reduction during nature-based excursions.

Findings showed significant relative contributions of all four OAE contexts to environmental sustainability behaviors. This finding aligns with the study of Hanna *et al.* (2019), who asserted that outdoor adventure tourism offers more than just physical experiences; it facilitates human reconnections with nature, which in turn nurtures pro-environmental attitudes and sustainable behaviors. Through direct engagement in amusement park settings, youths not only enjoy recreational exposure but also develop a deeper ecological consciousness that influences their commitment to environmental stewardship. Similarly, Said *et al.* (2024) supported this view by emphasizing the importance of embedding sustainability into everyday experiences, including recreational and leisure activities. Their findings highlight that when environmental awareness is integrated into public interactions — like those in amusement parks — it encourages responsible behaviors aligned with ecological preservation. Additionally, the work of Faiza and Rohani (2024) lends weight to this result, as they argued that fostering environmental values in leisure and work environments contributes to sustained pro-environmental behaviors.

Moreover, the findings revealed that there is a significant relationship between OAE programs in recreation and environmental sustainability behaviors among youth. This finding aligns with the study of Tennakoon *et al.* (2024), who highlighted that active participation in environmental sustainability practices — especially when integrated into recreation — enhances individual commitment to conservation principles. Their systematic review showed that environmental knowledge gained through interactive and enjoyable contexts leads to more durable pro-environmental attitudes. Similarly, Sand and Gross (2019) supported this assertion by demonstrating that adventure recreation, such as hiking, diving, or kayaking, exposes participants to the fragile state of natural ecosystems, thereby cultivating a deeper sense of environmental responsibility. Moreover, Snyder (2019) also agreed with this perspective, asserting that outdoor education programs, especially those linked to leisure and recreational environments, actively foster environmental consciousness and behavior change.

Furthermore, the findings from the study also showed that there is a significant relationship between OAE programs in sports and environmental sustainability behaviors among youth. This finding aligns with the study of Spencer *et al.* (2019), who asserted that outdoor education programs combined with physically engaging activities, such as hiking and team sports in natural environments, foster both environmental knowledge and sustainable behavioral practices. Their research revealed that embedding environmental lessons within active sporting experiences helps participants appreciate nature while simultaneously reinforcing conservation habits. Similarly, this finding agrees with the conclusions of Hanna *et al.* (2019), who maintained that outdoor adventure tourism, including physically intensive activities, plays a significant role in reawakening human-nature relationships and instilling pro-environmental attitudes. Furthermore, Reid and Kampman (2020) supported this finding by highlighting that outdoor sports and eco-tourism activities, particularly when rooted in community-led conservation principles, can significantly influence sustainable behaviors among participants. Their work found that such activities offer youths real-life perspectives on biodiversity conservation, resource protection, and ecological integrity, thereby embedding long-lasting behavioral change.

It was observed that there is a significant relationship between OAE programs in tourism and environmental sustainability behaviors among youths. This finding aligns with the study of Sand and Gross (2019), who asserted that outdoor adventure tourism programs directly immerse participants in the environmental realities of sensitive ecosystems, enabling them to witness both beauty and vulnerability firsthand, thereby nurturing pro-environmental behaviors. Likewise, Hanna *et al.* (2019) highlighted that outdoor adventure tourism not only reconnects individuals with nature but also enhances their awareness of human impact on the environment, fostering behaviors supportive of sustainability goals. This process is especially impactful among youths, whose experiences during tourism-based education shape their worldview and future choices regarding ecological conservation. Moreover, this finding aligns with Reid and Kampman (2020), who noted that tourism-centered outdoor education programs, particularly those involving eco-tourism principles, empower both local communities and visitors to become active custodians of the environment.

Findings from the study indicated that there is a significant relative contribution of OAE programs in amusement parks, creation, sports, and tourism, and the dependent variable (environmental sustainability behaviors) among youth. This finding aligns with the study of Brymer *et al.* (2019), who asserted that OAE programs foster a strong sense of environmental stewardship by connecting individuals to nature through direct experiences. Their research emphasized that structured outdoor activities, whether through

sports, tourism, or recreational engagements, allow young people to build emotional bonds with nature, which in turn cultivates pro-environmental attitudes and long-lasting sustainability behaviors. Similarly, this finding agrees with the submission of Hanna *et al.* (2019), who argued that outdoor education activities such as guided ecological tours, wilderness challenges, and nature-based sports contribute significantly to the development of responsible environmental actions among participants. Additionally, the finding is supported by the work of Goudie (2019), who emphasized that outdoor recreation and tourism serve as platforms for environmental literacy, offering participants opportunities to practice sustainable behaviors through hands-on activities such as wildlife monitoring and habitat restoration.

This finding aligns with the study of Hanna *et al.* (2019), who asserted that OAE programs foster environmental stewardship among young people by promoting hands-on experiences in ecological conservation activities. According to their research, participants engaged in outdoor learning, particularly through structured recreation and nature-based sports, were more inclined to develop pro-environmental attitudes and long-lasting ecological responsibility. Similarly, this finding agrees with the submission of Kuo *et al.* (2019), who emphasized that outdoor adventure activities such as sports, tourism, and recreational programs play a critical role in shaping sustainable behaviors by offering immersive experiences that build a strong connection with the natural world. Their study further suggested that exposure to nature-based activities not only enhances environmental literacy but also encourages deliberate action towards the protection and conservation of ecosystems. Furthermore, this finding corroborates the assertion of Goudie (2019), who reported that outdoor adventure programs — including those set in amusement parks, wilderness areas, and recreation centers — significantly contribute to the internalization of sustainable behaviors.

Conclusion

This study shows that youths perceive a positive correlation between participation in OAE programs and their environmental sustainability behaviors across amusement parks, recreation, sports, and tourism contexts. Based on the participants' responses, engaging in outdoor activities, whether in amusement parks, recreational spaces, sports events, or tourism, plays a significant role in shaping how young people think and act toward nature. Youths who take part in these outdoor programs develop useful habits like reducing waste, protecting wildlife, and conserving natural resources. The study also showed that these outdoor experiences not only teach about the environment but also encourage personal responsibility in taking care of it. The study concludes that when OAE is well-structured, it gives young people the chance to experience nature first-hand, which leads to stronger

environmental values. High self-reported agreement ratings suggest that participants believe OAE programs support their environmental awareness, pro-environmental attitudes, and sustainability-related practices, although actual behaviors were not directly observed. Whether it is through sports, recreation, tourism, or amusement park activities, the process of learning outdoors helps youths develop the right mindset and daily habits to live in harmony with nature. The study also revealed that the joint and individual contributions of these activities make a meaningful difference in promoting sustainable behaviors. In summary, OAE programs are an effective way of teaching Nigerian youths how to act in ways that will protect the environment now and in the future. If schools, communities, and government agencies continue to invest in these programs, the benefits for Nigeria's environment and young population will be long-lasting. OAE programs have the potential to promote sustainability perceptions among youths in Ondo State, but to achieve broader adoption, cultural, socioeconomic, and infrastructure constraints must be addressed to prevent overreliance on experiential exposure alone.

Limitations

While significant correlations exist ($r=0.515-0.832$), cultural norms (e.g., as the primarily Yoruba sample (65.6%) indicates, Yoruba emphasis on communal resources use may hinder adoption of individual sustainability behaviors. Personal backgrounds, including low-middle income (majority $< \#50,000/\text{month}$) and different levels of education, could limit practical implementation despite positive perceptions. Infrastructure constraints, such as poor maintenance of parks and sports facilities in Nigeria, impact the sustainability of outdoor educational programs (Ngobua et al., 2021). The data are based on self-reported perceptions, which are subject to social desirability bias and may not accurately reflect participants' actual environmental behaviors. These limitations highlight the need for future longitudinal and mixed-methods research that incorporates objective behavioral indicators alongside self-report measures. Considering these factors, behavioral persistence should be monitored in future continuous investigations.

Recommendations

Based on the above findings, it is therefore recommended that:

1. Environmental education should be built into all amusement park programs for young visitors in Nigeria.
2. Recreational centers should be encouraged to offer eco-friendly outdoor activities and workshops for youths regularly.
3. Sports organizations should design sports-based environmental education sessions as part of their youth sports programs.

4. Eco-tourism operators should always include environmental conservation lessons in every youth tour package.
5. Amusement park management should partner with environmental NGOs to host monthly youth-focused nature conservation events.
6. Schools should include recreation-based environmental clubs and organize regular field trips to nature parks.
7. Sports coaches and physical education teachers should include environmental topics in their training sessions.
8. Tourism activities teach environmental responsibility; local tourism boards should promote youth eco-camps that mix tourism and conservation learning.
9. Policymakers should promote a combined approach by linking parks, sports, recreation, and tourism programs to a single youth environmental education framework.
10. Schools and community groups should organize joint outdoor education camps that mix sports, recreation, amusement, and tourism for Nigerian youths.

Suggestions for Further Studies

Future research should focus on how OAE programs can be designed to fit the unique cultural, social, and economic backgrounds of different groups of Nigerian youths. While this study looked at general relationships between outdoor programs and sustainability behaviors, future studies could investigate how factors like age, gender, region, and level of education affect these behaviors. It would also be useful to explore the role of teachers, parents, and community leaders in reinforcing the lessons learned through outdoor education. Researchers could also carry out studies to check if the behaviors taught through these outdoor programs remain consistent as youths grow older. In addition, more studies could compare the experiences of Nigerian youths with those from other countries to learn from global best practices on outdoor education and environmental sustainability.

Acknowledgements

This study complied with ethical principles for research involving human participation. All participants were adults, participation was voluntary, and informed consent and confidentiality were ensured. This research received no specific grant from any funding agency in the public, commercial, or NGO sectors. We acknowledge the research assistants who assisted with data collection and the participating organizations in Ondo State, Nigeria, for their cooperation.

Conflict of Interest: The authors reported no conflict of interest.

Data Availability: All data are included in the content of the paper.

Funding Statement: The authors did not obtain any funding for this research.

Declaration for Human Participants: This study has been approved by the Ethics Committee of the School of Agriculture and Agricultural Technology, Federal University of Technology, Akure, Nigeria, and the principles of the Helsinki Declaration were followed.

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