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Abstract

Tourism destinations globally are pursuing product diversification to enhance competitiveness and meet evolving traveler preferences. Adventure tourism has emerged as a significant growth sector, offering unique experiences that combine physical challenges with environmental and cultural engagement. The tourism industry in Kenya faces significant challenges in optimizing adventure tourism's contribution to sustainable development. While several studies have explored various tourism aspects, there remains a significant gap in understanding how adventure tourism products contribute to sustainable development in Nakuru County, particularly regarding types of adventure tourism products. Thus, the study examined the effect of types of adventure tourism products on sustainable tourism development. The theoretical framework was grounded in Weaver's Model and Diffusion of Innovation Theory, supported through a correlational research design. The target population comprised 507,751 individuals including adventure tourists at four key adventure sites (Lake Nakuru National Park, Hell's Gate National Park, Menengai Crater, Mt. Longonot National Park) and seven key stakeholder groups in Nakuru County. Using stratified random sampling, 400 respondents were targeted and 378 complete responses were received, achieving a 94.5% response rate. The findings revealed a significant positive relationship between types of adventure tourism products and sustainable tourism development, with a correlation coefficient of $r=.643$ (significant at $p=0.000$). The regression analysis confirmed this relationship, with types of adventure tourism products ($\beta=0.315$, $t=9.398$, $p=0.000$) showing a significant positive effect on sustainable tourism development. The study recommends that adventure tourism operators should improve the structure and definition of their adventure products, with clear safety protocols and cultural sensitivity, while tourism authorities should establish comprehensive product development guidelines. Future research should explore additional variables beyond adventure tourism products and conduct comparative studies in other counties to identify region-specific versus universal factors in adventure tourism's contribution to sustainable development.

Keywords: *Adventure tourism, sustainable development, Nakuru County, Kenya*

1.0 Background to the Study

Tourism is a significant economic force and contributor to sustainable development. Sustainable tourism is important because it not only preserves the environment and cultural assets for future generations, but also supports local economies by creating jobs, enhancing community livelihoods, and fostering environmental conservation efforts (Malara et al., 2022). Globally, adventure tourism has gained recognition as a vital component of sustainable development strategies. Cavallo, Joseph and Howard, (2020) in Italy and China revealed varying interests in sustainable tourism among young travelers. Carvache-Franco et al. (2022) in Ecuador identified five key motivational factors for adventure tourists. Furthermore, Ivasciuc and Ispas, (2023) in Romania argued that intrinsic motivation drives sustainable mountain tourism. Malara et al. (2022) in Iran proposed a 9Cs model for sustainable adventure tourism marketing, incorporating customer focus, cost considerations, convenience factors, communication strategies, coordination mechanisms, credibility building, capability development, compatibility assessment, and concern for environmental sustainability. Community empowerment and strategic marketing are essential to maximize tourism's contribution to sustainable development.

Regionally, African countries have begun exploring adventure tourism's role in sustainable development. Bartis and Madlwabinga (2020) in South Africa found Gauteng Province tourists were the largest group visiting Lesotho, motivated by scenery and culture. Musakwa et al., (2020) in Zimbabwe found collaboration improved biodiversity conservation in parks. Additionally, Kimaro et al., (2019) in Tanzania argued social entrepreneurship in tourism can empower communities and advance SDGs. These studies demonstrate that effective collaboration and innovative approaches are essential for achieving sustainable tourism outcomes across the African continent. Mwango and Phiri (2022) in Zambia found effective sustainable marketing strategies influences tourism. In Kenya, adventure tourism presents significant opportunities for sustainable development. Weru et al. (2024) found that adventure activities like theme park adventures and wildlife viewing significantly influence sustainable tourism development. Mshai (2022) identified that adventure-related pull factors strongly motivate domestic tourists in coastal regions. Research on marketing adventure tourism by Wahome and Gathungu (2021) highlighted untapped opportunities in promoting sustainable adventure experiences.

Types of adventure tourism products encompass various categories that contribute to sustainable tourism development, as evidenced by research in different contexts. Malara et al. (2022) noted that key adventure tourism products include trekking and hiking activities, which when properly structured promote environmental preservation while meeting tourist expectations. (Al POP et al., (2021) emphasized that adventure tourism products are pivotal for strategic development and marketing in Nakuru County. Cavagnaro et al. (2021) highlighted how well-defined products contribute to sustainable practices by offering engaging experiences that support local economies and preserve natural resources. Thus, the current study sought to examine various types of adventure tourism product that influence sustainable tourism development in Nakuru County, Kenya. The Kenya National Bureau of Statistics ((Kenya National Bureau of Statistics, 2024) reported declining visitor numbers, including a reduction in visitors to Lake Nakuru National Park from 233,000 in 2019 to 185,100 in 2022, while Hell's Gate National Park saw a decline from 165,600 visitors in 2019 to 73,700 in 2021. Additionally, existing literature reveals a knowledge gap, marketing and stakeholder collaboration can collectively contribute to sustainability.

1.1 Statement of the Problem

Tourism represents a critical economic sector for Kenya, contributing significantly to foreign exchange earnings, employment creation, and regional development. Kenya has previously relied on wildlife safari and beach tourism as her core products and services which do not meet the ever-changing demands of consumer preferences and experiences (Government of Kenya, 2025). There are unexploited and underdeveloped products including sports, adventure, culture and heritage, health tourism, ecotourism, community-based tourism, agro tourism, and entertainment among others ((Tourism Regulatory Authority, 2023). Adventure tourism is increasingly becoming popular among youths and independent travelers looking for challenging and unique experiences (Government of Kenya, 2025). To harness the adventure tourism potential, the National Government will support development of infrastructure along adventure circuits, profile and promote adventure tourism in the country, promote safety and security measures for tourists, and support development of adventure tourism products in conjunction with host communities and other stakeholders (Government of Kenya, 2025). Many tourism development efforts have concentrated on traditional attractions such as wildlife safaris and coastal tourism, limiting understanding of how emerging tourism products contribute to sustainable development. While government policy recognizes adventure tourism's potential, significant knowledge gaps remain regarding how adventure tourism products influence sustainability outcomes ((Wahome & Gathungu, 2021). The focus on established attractions has resulted in insufficient research attention to adventure tourism's contribution to sustainable development. This knowledge gap is particularly pronounced in regional contexts like Nakuru County (Thukia et al., 2022).

1.2 Objective of the Study

To examine various types of adventure tourism product that influence sustainable tourism development in Nakuru County, Kenya.

1.3 Research Hypothesis

H₀: Types of adventure tourism product has no significant effect on sustainable tourism development in Nakuru County, Kenya.

1.4 Conceptual Framework

The summary of the conceptual framework is presented in Figure 1

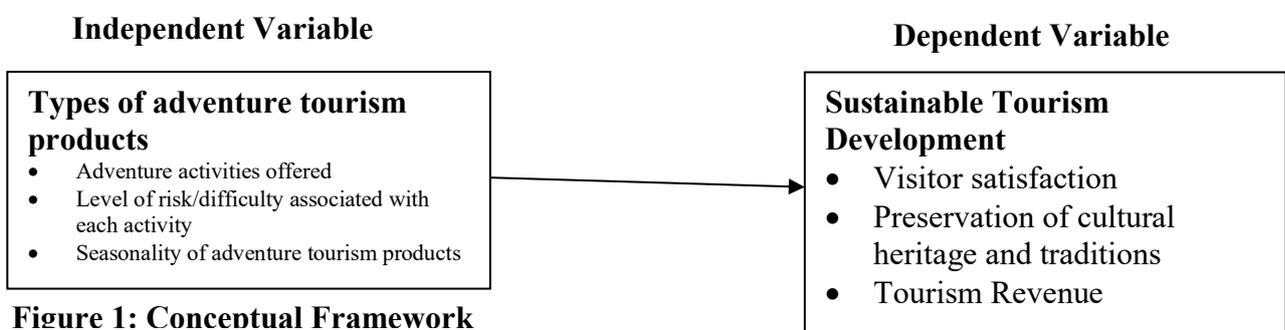


Figure 1: Conceptual Framework

2.0 Literature Review

The literature review is presented in sections.

2.1 Sustainable Tourism Development

Sustainable tourism development represents a paradigmatic approach to tourism planning and management that seeks to balance economic viability, environmental protection, and social equity while ensuring long-term industry sustainability. United Nations (2015) establish that

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sustainable tourism development aligns directly with the United Nations Sustainable Development Goals, particularly SDGs 8 (Decent Work and Economic Growth), 11 (Sustainable Cities and Communities), 12 (Responsible Consumption and Production), 14 (Life Below Water), and 15 (Life on Land), which provide a global framework for sustainable tourism implementation. Kimaro et al. (2019) demonstrate that sustainable tourism development is grounded in the triple bottom line approach, which emphasizes the simultaneous achievement of economic prosperity, environmental conservation, and social well-being while ensuring intergenerational equity. The theoretical foundation of sustainable tourism development rests on the principle of intergenerational equity, ensuring that current tourism activities do not compromise the ability of future generations to meet their own needs.

Jani (2021) establish that this principle requires tourism destinations to maintain the integrity of natural ecosystems, preserve cultural heritage, and generate equitable economic benefits for local communities while minimizing environmental impacts. Research demonstrates that sustainable tourism development encompasses three interconnected dimensions that must be simultaneously addressed for genuine sustainability achievement. Chauke et al. (2022) emphasize that environmental sustainability requires tourism activities to minimize negative impacts on natural resources, biodiversity, and ecosystem services while promoting conservation efforts through tourism revenue generation and visitor education programs. Social sustainability focuses on preserving cultural heritage, ensuring community participation in tourism development, and maintaining social cohesion while respecting local customs and traditions. Thukia et al. (2022) demonstrate that social sustainability involves community empowerment through tourism development, cultural preservation through authentic tourism experiences, and social equity through fair benefit distribution among community members. Economic sustainability involves generating viable long-term economic benefits for destinations while ensuring equitable distribution of tourism revenues among stakeholders and supporting local economic development.

Eshaer Ac et al., (2023) establish that economic sustainability requires tourism activities to generate sufficient revenue to support conservation efforts, community development, and infrastructure maintenance while creating employment opportunities for local populations. The operationalization of sustainable tourism development requires measurable indicators that capture its multidimensional nature, with international research establishing three core measurement categories that effectively assess sustainability outcomes in tourism contexts. Visitor satisfaction serves as a critical sustainability indicator when properly contextualized within sustainable tourism development framework. Job et al., (2020) demonstrate that visitor satisfaction with sustainable tourism practices, including environmental conservation experiences and authentic cultural interactions, indicates the viability of sustainability-oriented tourism products and creates positive feedback loops for sustainability initiatives. Cultural heritage preservation serves as both a sustainability outcome and process indicator, ensuring that tourism development respects and enhances rather than commodifies or degrades local cultural assets.

Wahome and Gathungu, (2021) demonstrate that effective cultural preservation involves community participation in tourism activities, maintenance of traditional practices, and protection of cultural sites while generating economic benefits for cultural practitioners. Bartis and Madlwabinga (2020) establish that cultural heritage preservation through tourism requires authentic representation of local cultures, community control over cultural tourism development, and equitable benefit distribution to cultural heritage custodians. Bora et al. (2024) establish that sustainable tourism development requires economically viable tourism operations that generate revenues supporting conservation efforts, community development,

and long-term destination competitiveness while demonstrating equitable benefit distribution and contributing to local economic development rather than solely benefiting external operators. In Kenya's tourism context, sustainable tourism development has been operationalized through comprehensive measurement approaches that integrate these three dimensions of visitor satisfaction, cultural heritage preservation, and tourism revenue generation. Juma and Khademi-Vidra (2019) demonstrate that successful sustainable tourism development in Kenya requires simultaneous achievement of visitor satisfaction with authentic experiences, effective cultural heritage preservation through community involvement, and measurable economic benefits supporting conservation and local development. Mwamburi (2020) validates these measurement approaches in forest tourism contexts, demonstrating their applicability to diverse Kenyan tourism environments from coastal areas to highland forests.

2.2 Types of Adventure Tourism Product and Sustainable Tourism Development

Adventure tourism products encompass diverse categories of tourism offerings that combine physical activities, risk elements, natural environment interaction, and cultural experiences to create memorable experiences for tourists while contributing to destination sustainability. Rojo-Ramos (2020) demonstrate that trekking tourism products in Spain contribute to sustainable tourism development through environmental preservation while meeting tourist expectations, establishing that well-structured adventure tourism activities promote conservation awareness and responsible visitor behavior. Carvache-Franco et al. (2022) establish that adventure tourism products addressing key motivational factors including relaxation, learning opportunities, social connections, biosecurity measures, and competence development contribute more effectively to sustainable tourism development by creating meaningful experiences that generate long-term visitor loyalty and conservation support. Their research demonstrates that adventure tourism products differ from conventional tourism offerings through their emphasis on active participation, skill development, and direct interaction with natural environment

Chauke et al. (2022) demonstrate that adventure tourism products incorporating traditional cultural elements create sustainable economic opportunities for community members while preserving cultural heritage for future generations, with research showing that culturally integrated adventure tourism products generate higher visitor satisfaction and longer-term economic benefits compared to purely activity-based offerings. Bob and Gounden (2024) demonstrate that socio-economic factors significantly influence tourism participation pattern. Melese and Belda (2021) examined determinants of tourism product development in Southeast Ethiopia from marketing perspectives, demonstrating that adventure tourism products require substantial local human resources including specialized guides, safety personnel, equipment handlers, and cultural interpreters, creating direct employment opportunities that support community economic development. Their research shows that adventure tourism products often require locally sourced equipment, food supplies, and services, creating indirect economic benefits through supply chain integration with local businesses and producers.

Kyriakaki and Kleinaki (2021) establish that adventure tourism products designed with local community input and cultural sensitivity requirements contribute more effectively to sustainable tourism development by ensuring cultural authenticity, community ownership, and equitable benefit distribution among stakeholders. Al POP et al. (2021) establish that adventure tourism products incorporating motivational factors that encourage environmental learning and cultural engagement create stronger visitor commitment to destination sustainability objectives, demonstrating that well-designed products balance challenge levels with participant skills while creating optimal experience conditions. Weru et al. (2024) reveal that theme park

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adventures, wildlife viewing, and nature walks form significant adventure tourism products that contribute to sustainable tourism development by diversifying visitor experiences, extending length of stay, and creating additional revenue streams for tourism destinations. Their research demonstrates that these adventure products enhance visitor satisfaction through active engagement while supporting conservation funding through increased tourism revenue generation and visitor education about environmental protection.

Mwamburi (2020) emphasizes forest-based adventures such as canopy walks, bird watching, and botanical tours as important product offerings that contribute to sustainable tourism development in Taita-Taveta County, showing how these activities generate income for local communities while promoting forest conservation and environmental education among visitors. Cavagnaro et al. (2021) establish that adventure tourism products designed to address young travelers' self-transcendence values and sustainability motivations create stronger connections between tourism experiences and conservation outcomes.

2.3 Theoretical Framework

The theoretical framework for examining types of adventure tourism products and their influence on sustainable tourism development primarily draws from Weaver's Model and Diffusion of Innovation Theory. Weaver's Model, developed by David Bruce Weaver in 2000, provides the foundational framework for understanding how tourism destinations evolve along two critical dimensions: the level of intentionality in sustainability planning and the degree of sustainability actually achieved. This model directly supports the examination of adventure tourism products by offering a structured approach to assess how deliberately designed and implemented adventure tourism offerings contribute to measurable sustainability outcomes. The model's four-category classification system (circumstantial alternative tourism, deliberate alternative tourism, unsustainable mass tourism, and sustainable mass tourism) enables researchers to evaluate where specific adventure tourism products fall within the sustainability spectrum and whether their design reflects intentional sustainability planning or merely coincidental outcomes.

Diffusion of innovation theory, originally developed by Everett M. Rogers in 1962, provides additional theoretical grounding for understanding how adventure tourism products gain acceptance and spread through tourist markets. The theory's emphasis on innovation attributes - relative advantage, compatibility, trialability, observability, and perceived complexity - directly applies to adventure tourism product development and adoption. Adventure tourism products must demonstrate clear advantages over conventional tourism offerings, align with tourist values and expectations, allow for trial experiences, provide visible benefits, and maintain appropriate complexity levels to facilitate adoption across different tourist segments. Together, these theories explain how well-designed adventure tourism products that intentionally incorporate sustainability principles while meeting innovation adoption criteria can effectively contribute to sustainable tourism development outcomes through both deliberate planning and market acceptance mechanisms.

3.0 Research Methodology

The study employed a correlational research design to examine relationships between adventure tourism products and sustainable tourism development in Nakuru County, Kenya. The research targeted a population of 507,751 individuals across four key adventure sites (Lake Nakuru National Park, Hell's Gate National Park, Menengai Crater, and Mt. Longonot National Park) plus seven stakeholder categories including tour companies, adventure sport providers, county tourism officials, KWS officials, NEMA officials, environmental NGOs, and community conservation groups. Using Yamane's formula with a 95% confidence level, the

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study calculated a sample size of 400 respondents, comprising 393 adventure tourists selected through stratified random sampling across the four sites, and 7 stakeholder representatives selected through census sampling to ensure complete coverage of all relevant stakeholder categories.

Data collection utilized structured questionnaires for adventure tourists and interview guides for stakeholders, with research assistants strategically positioned at equipment rental stations, briefing areas, and rest stops during peak hours (9am-4pm) to minimize disruption to tourism activities. The instruments underwent rigorous validation through pre-testing with 47 respondents (40 tourists and 7 stakeholders), achieving strong reliability coefficients above 0.7 for all variables (adventure tourism products: 0.972, motivators: 0.868, marketing: 0.943, stakeholder collaboration: 0.919, sustainable development: 0.894). Factor analysis confirmed construct validity with all factor loadings exceeding the 0.4 threshold, while content validity was established through expert review and participant feedback during pre-testing. The study achieved a 94.5% response rate, with data analyzed using descriptive statistics, correlation analysis, and regression modeling to examine the relationships between variables.

4.0 Findings and Discussions

The chapter examines the findings and discusses them in a well-organized manner that corresponds to its objectives. The findings are displayed through charts, narratives, and tables to improve comprehension.

4.1 Response Rate

The sample size for this study comprised 393 adventure tourists from five key adventure sites and 7 stakeholder representatives from various tourism-related organizations, totaling 400 respondents. The study achieved different response rates for quantitative and qualitative data collection methods. For quantitative data collection using questionnaires, the study targeted 393 adventure tourists distributed across Lake Nakuru National Park (128), Hell's Gate National Park (113), Menengai Crater (60) and Mt. Longonot National Park (56). Out of the 393 targeted adventure tourists, 371 properly completed questionnaires were received, representing a quantitative response rate of 94.40%. For qualitative data collection using interview schedules, all 7 stakeholder representatives participated, achieving a 100% response rate for interviews. The combined analysis was based on 378 total responses (371 questionnaires + 7 interviews), representing an overall response rate of 94.50%. The summary of the response rates is presented in Table 1.

Table 1: Response Rate

Category	Sample Size	Questionnaire Response	Interview Response	Total Response	Response Percentage
Lake Nakuru National Park	164	151	-	151	92.07
Hell's Gate National Park	113	109	-	109	96.46
Menengai Crater	60	57	-	57	95.00
Mt. Longonot National Park	56	54	-	54	96.43
Subtotal Questionnaires	393	371	-	371	94.40
Tour Companies	1	-	1	1	100
Adventure Sport Providers	1	-	1	1	100
County Tourism Department	1	-	1	1	100
KWS Officials	1	-	1	1	100
NEMA Officials	1	-	1	1	100
Environmental NGOs	1	-	1	1	100
Community Conservation Groups	1	-	1	1	100
Subtotal Interviews	7	-	7	7	100
Total	400	371	7	378	94.50

Table 1 reveals a high response rate across all respondent categories. All stakeholder representatives (tour companies, adventure sport providers, county tourism department, KWS officials, NEMA officials, environmental NGOs, and community conservation groups) demonstrated perfect participation with a 100% response rate. Among adventure tourists, Mt. Longonot National Park showed a strong response rate at 96.43%, with 54 out of 56 sampled individuals responding. This was closely followed by Hell's Gate National Park with a 96.46% response rate (109 out of 113) and Menengai Crater with 95.00% (57 out of 60). Lake Nakuru National Park achieved a 92.07% response rate with 151 out of 164 participants completing the survey. The overall response rate of 94.50% reflects a high level of participation, which enhances the reliability of the survey results and increases confidence in the findings, as supported by Babbie (2014) who argues that response rates above 70% significantly reduce non-response bias and enhance the credibility of survey findings. This aligns with Dillman et al. (2016) who demonstrate that high response rates strengthen the generalizability of research results and reduce the likelihood of systematic bias. The strong response rate also suggests that the research topic is highly relevant to adventure tourists and tourism stakeholders in the region.

4.2 Descriptive Statistics

The objective of the study was to examine various types of adventure tourism products that influence sustainable tourism development in Nakuru County, Kenya. Table 2 presents the descriptive statistics on types of adventure tourism products.

Table 2: Descriptive Statistics of Types of Products

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
Adventure tourism activities are well-structured and clearly defined in this adventure site.	22.60%	60.40%	5.40%	9.40%	2.20%	2.08	0.92
Different levels of difficulty are provided for tourists depending on their experience.	29.10%	46.10%	5.10%	14.60%	5.10%	2.20	1.16
The adventure products offered are unique and appeal to a broad range of tourists.	22.60%	49.10%	10.20%	12.90%	5.10%	2.29	1.11
Adventure products are available all year round and not limited by seasonality.	22.90%	50.10%	5.40%	18.90%	2.70%	2.28	1.10
There are proper safety measures in place for all adventure tourism activities.	29.60%	58.00%	1.60%	5.90%	4.90%	1.98	0.99
Adventure products are designed to enhance tourists' engagement with nature.	14.80%	65.00%	4.00%	10.80%	5.40%	2.27	1.02
The adventure activities here promote environmental conservation.	33.70%	45.30%	7.80%	10.00%	3.20%	2.04	1.05
Adventure tourism products are customized to suit the preferences of different tourists.	35.00%	47.70%	2.40%	11.30%	3.50%	2.01	1.07
Adventure tourism products are culturally sensitive and promote local heritage.	27.80%	54.40%	6.70%	8.60%	2.40%	2.03	0.95
The variety of adventure activities available increases tourist satisfaction.	18.30%	58.00%	5.40%	11.90%	6.50%	2.30	1.10
There is clear communication about the risks involved in each adventure activity.	33.70%	46.90%	6.20%	12.10%	1.10%	2.00	0.99
Adventure tourism products in this adventure site contribute to local economic development.	13.20%	61.50%	4.90%	14.30%	6.20%	2.39	1.08
Mean						2.16	1.05

The study found that 83.0% (22.60%+60.40%) of respondents disagreed that adventure tourism activities are well-structured and clearly defined in their adventure site, while only 11.60% agreed with this statement, with 5.40% remaining neutral. The mean score for this item was 2.08 with a standard deviation of 0.92. This suggests that the majority of adventure tourists in Nakuru County perceive significant gaps in how adventure activities are structured and defined. Besides, 75.20% of respondents disagreed that different levels of difficulty are provided for tourists depending on their experience, while only 19.70% agreed with this statement, with 5.10% remaining neutral. The mean score was 2.20 with a standard deviation of 1.16. This indicates a perceived lack of differentiated adventure experiences catering to various skill levels. Moreover, 71.70% of respondents disagreed that the adventure products offered are

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unique and appeal to a broad range of tourists, while only 18.00% agreed with this statement, with 10.20% remaining neutral.

The mean score was 2.29 with a standard deviation of 1.11. This reveals a perceived lack of product uniqueness and broad appeal. In addition, 73.00% of respondents disagreed that adventure products are available all year round and not limited by seasonality, while only 21.60% agreed with this statement, with 5.40% remaining neutral. The mean score was 2.28 with a standard deviation of 1.10. This suggests limited year-round availability of adventure tourism products. Also, 87.60% of respondents disagreed that there are proper safety measures in place for all adventure tourism activities, while only 10.80% agreed with this statement, with 1.60% remaining neutral. The mean score was 1.98 with a standard deviation of 0.99. This reflects the perceived absence of adequate safety protocols across adventure sites in Nakuru County. Furthermore, 79.80% of respondents disagreed that adventure products are designed to enhance tourists' engagement with nature, while only 16.20% agreed with this statement, with 4.00% remaining neutral. The mean score was 2.27 with a standard deviation of 1.02. This indicates a perceived disconnect between adventure activities and natural environment engagement. Likewise, 79.00% of respondents disagreed that the adventure activities promote environmental conservation, while only 13.20% agreed, with 7.80% neutral. The mean score was 2.04 with a standard deviation of 1.05.

In addition, 82.70% of respondents disagreed that adventure tourism products are customized to suit the preferences of different tourists, while 14.80% agreed, with 2.40% neutral. The mean score was 2.01 with a standard deviation of 1.07. This shows perceived deficiencies in product customization for diverse tourist preferences. Additionally, 82.20% of respondents disagreed that adventure tourism products are culturally sensitive and promote local heritage, while only 11.00% agreed with this statement, with 6.70% remaining neutral. The mean score was 2.03 with a standard deviation of 0.95. This indicates that adventure products are not perceived as effectively incorporating or respecting local cultural elements. Moreover, 76.30% of respondents disagreed that the variety of adventure activities available increases tourist satisfaction, while only 18.40% agreed with this statement, with 5.40% remaining neutral. The mean score was 2.30 with a standard deviation of 1.10. This suggests perceived limitations in the range and diversity of adventure offerings that could enhance visitor experiences.

Also, 80.60% of respondents disagreed that there is clear communication about the risks involved in each adventure activity, while only 13.20% agreed with this statement, with 6.20% remaining neutral. The mean score was 2.00 with a standard deviation of 0.99. This reflects perceived inadequacies in risk communication, potentially affecting visitor safety and satisfaction. Lastly, 74.70% of respondents disagreed that adventure tourism products in the adventure site contribute to local economic development, while only 20.50% agreed with this statement, with 4.90% remaining neutral. The mean score was 2.39 with a standard deviation of 1.08. This suggests that adventure tourism is not widely perceived as making significant economic contributions to local communities. The qualitative findings from open-ended questions and stakeholder interviews provided deeper context to these quantitative results. When asked about what types of adventure tourism products influence sustainable tourism development in Nakuru County, respondents provided a wide range of activities that contrasted somewhat with the quantitative findings.

Nature-based activities were most frequently mentioned, with "hiking at Menengai Crater," "cycling tours in Hell's Gate National Park," "rock climbing at Fischer's Tower," and "bird watching at Lake Nakuru National Park" being the most common responses. One respondent (Tourist 045) elaborated: *"Hiking at Menengai Crater allows tourists to appreciate natural landscapes while having minimal environmental impact."* Another respondent (Tourist 128)

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noted: *"Cycling in Hell's Gate National Park reduces carbon footprint compared to motorized tourism activities."* Water-based activities featured prominently, including "boat safaris on Lake Naivasha" and "fishing with local communities on Lake Naivasha."

A respondent (Tourist 201) explained: *"Boat safaris on Lake Naivasha can be sustainable when operators follow proper environmental guidelines and educate tourists about lake conservation."* Wildlife-focused adventures were highlighted, including "game drives in Soysambu Conservancy," "nature walks in Crescent Island Game Sanctuary," and "engaging in responsible wildlife tracking." One participant (Tourist 167) stated: *"Game drives when conducted responsibly with proper guidelines can generate revenue for conservation efforts while educating visitors."*

Cultural tourism elements were mentioned by several respondents, including "cultural tours with local Maasai communities," "participating in local dance and music workshops," and "learning traditional crafts from local artisans." A respondent (Tourist 089) noted: *"Cultural tours with local Maasai communities provide direct economic benefits to local people while preserving cultural heritage."* Educational and conservation-oriented activities were emphasized, including "participation in tree planting initiatives," "educational tours about local flora and fauna," "volunteering with wildlife conservation projects," and "participating in local environmental education programs."

One respondent (Tourist 312) stressed: *"Participating in tree planting initiatives helps offset the environmental impact of tourism while educating visitors about conservation."* Geothermal and geological attractions were mentioned, including "visits to geothermal sites within Hell's Gate," "exploring caves within the Rift Valley," "exploring the Njoro River Cave," and "exploring the Elementaita Badlands." A participant (Tourist 254) explained: *"Exploring the Olkaria Geothermal Spa helps tourists understand renewable energy while enjoying a unique adventure experience."*

Agricultural and rural tourism options were noted, including "engaging in agro-tourism activities," "learning about sustainable poultry farming practices," "learning about sustainable dairy farming practices," and "engaging in sustainable tea and coffee farm tours." One respondent (Tourist 193) commented: *"Agro-tourism activities help diversify income for local farmers while educating visitors about sustainable agriculture."* In stakeholder interviews, TC emphasized: *"Well-preserved forest areas and nature trails exist, but they need better structuring and signage to guide adventure tourists properly."* KWS stated: *"We need to create adaptive adventure programs for persons with disabilities and various skill levels to make our activities more inclusive."* NEMA noted: *"Digital safety training modules for tourists before undertaking high-risk activities are urgently needed but largely absent."* CCG added: *"Learning local crafts or dances during adventure camps would make our offerings more unique and culturally significant."*

The dependent variable in the study was sustainable tourism development in Nakuru County, with a focus on visitor satisfaction, preservation of cultural heritage, and tourism revenue. Table 3 presents the descriptive statistics on sustainable tourism development.

Table 3: Descriptive Statistics of Sustainable Tourism Development

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
The adventure tourism activities at this adventure site provide a high level of visitor satisfaction.	13.20%	65.20%	3.00%	12.70%	5.90%	2.33	1.05
Adventure tourism activities are well-organized and meet the expectations of tourists.	26.40%	41.20%	5.90%	20.80%	5.70%	2.38	1.23
Tourists are satisfied with the safety measures provided during adventure activities.	15.60%	53.60%	8.10%	12.40%	10.20%	2.48	1.20
The adventure site actively promotes and preserves the local culture and traditions through its adventure tourism activities.	23.70%	56.30%	5.10%	8.60%	6.20%	2.17	1.08
Adventure tourism at this adventure site helps to sustain local cultural practices and heritage.	32.60%	51.50%	1.90%	8.60%	5.40%	2.03	1.09
The adventure site integrates cultural experiences into its adventure tourism products, enhancing visitor appreciation.	32.30%	38.50%	4.60%	14.30%	10.20%	2.32	1.07
Adventure tourism activities contribute significantly to the adventure site's tourism revenue.	20.50%	53.10%	3.20%	13.20%	10.00%	2.39	1.23
Revenue from adventure tourism activities is used to support conservation efforts and local development.	27.00%	47.40%	3.80%	17.80%	4.00%	2.25	1.15
The adventure site's adventure tourism products attract repeat visitors, contributing to sustained tourism revenue.	40.70%	34.50%	6.70%	13.50%	4.60%	2.07	1.19
Adventure tourism activities at this adventure site contribute to the economic development of the surrounding community.	8.60%	65.80%	3.50%	10.50%	11.60%	2.41	1.01
The adventure site's focus on sustainability and eco-friendly tourism increases tourist satisfaction and revenue.	21.00%	62.80%	4.90%	10.00%	1.30%	2.08	0.88
The adventure tourism experiences at this adventure site promote long-term sustainable development in the region.	31.50%	54.70%	5.10%	4.60%	4.00%	1.95	0.96
Mean						2.24	1.10

The study found that 78.40% (13.20%+65.20%) of respondents disagreed that the adventure tourism activities at the adventure site provide a high level of visitor satisfaction, while only 18.60% agreed with this statement, with 3.00% remaining neutral. The mean score for this item was 2.33 with a standard deviation of 1.05. This suggests that the majority of adventure tourists in Nakuru County do not perceive the current adventure tourism activities as providing satisfactory experiences. Additionally, 67.60% of respondents disagreed that adventure tourism activities are well-organized and meet the expectations of tourists, while only 26.50% agreed with this statement, with 5.90% remaining neutral. The mean score was 2.38 with a standard deviation of 1.23. This indicates that most respondents perceive significant gaps between their expectations and the actual adventure tourism experiences offered. Moreover, 69.20% of respondents disagreed that tourists are satisfied with the safety measures provided during adventure activities, while only 22.60% agreed with this statement, with 8.10% remaining neutral. The mean score was 2.48 with a standard deviation of 1.20. This reveals a perceived lack of adequate safety measures, potentially affecting visitor satisfaction and overall tourism sustainability.

Furthermore, 80.00% of respondents disagreed that the adventure site actively promotes and preserves the local culture and traditions through its adventure tourism activities, while only 14.80% agreed with this statement, with 5.10% remaining neutral. The mean score was 2.17 with a standard deviation of 1.08. This suggests that cultural preservation is not perceived as a significant component of adventure tourism operations. Also, 84.10% of respondents disagreed that adventure tourism at the adventure site helps to sustain local cultural practices and heritage, while only 14.00% agreed with this statement, with 1.90% remaining neutral. The mean score was 2.03 with a standard deviation of 1.09. This reflects a perceived disconnection between

adventure tourism and cultural heritage preservation. In addition, 70.80% of respondents disagreed that the adventure site integrates cultural experiences into its adventure tourism products, enhancing visitor appreciation, while only 24.50% agreed with this statement, with 4.60% remaining neutral. The mean score was 2.32 with a standard deviation of 1.07. This indicates perceived deficiencies in cultural integration within adventure tourism offerings.

Furthermore, 73.60% of respondents disagreed that adventure tourism activities contribute significantly to the adventure site's tourism revenue, while only 23.20% agreed with this statement, with 3.20% remaining neutral. The mean score was 2.39 with a standard deviation of 1.23. This suggests that adventure tourism is not perceived as a major revenue generator for tourism sites. Similarly, 74.40% of respondents disagreed that revenue from adventure tourism activities is used to support conservation efforts and local development, while only 21.80% agreed with this statement, with 3.80% remaining neutral. The mean score was 2.25 with a standard deviation of 1.15. This indicates a perceived failure to channel tourism revenue toward conservation and community development. Additionally, 75.20% of respondents disagreed that the adventure site's adventure tourism products attract repeat visitors, contributing to sustained tourism revenue, while only 18.10% agreed with this statement, with 6.70% remaining neutral. The mean score was 2.07 with a standard deviation of 1.19. This suggests a perceived lack of visitor loyalty that could support long-term tourism sustainability.

Also, 74.40% of respondents disagreed that adventure tourism activities at the adventure site contribute to the economic development of the surrounding community, while only 22.10% agreed with this statement, with 3.50% remaining neutral. The mean score was 2.41 with a standard deviation of 1.01. This reflects a perceived failure to leverage adventure tourism for local economic benefits. Moreover, 83.80% of respondents disagreed that the adventure site's focus on sustainability and eco-friendly tourism increases tourist satisfaction and revenue, while only 11.30% agreed with this statement, with 4.90% remaining neutral. The mean score was 2.08 with a standard deviation of 0.88. This indicates that sustainability initiatives are not perceived as effectively enhancing visitor satisfaction or financial performance. Lastly, 86.20% of respondents disagreed that the adventure tourism experiences at the adventure site promote long-term sustainable development in the region, while only 8.60% agreed with this statement, with 5.10% remaining neutral. The mean score was 1.95 with a standard deviation of 0.96. This suggests a perceived failure of adventure tourism to contribute to broader sustainable development goals.

The qualitative findings from open-ended questions and stakeholder interviews provided deeper context to these quantitative results. When asked about how adventure tourism products have contributed to sustainable tourism development in terms of visitor satisfaction, cultural preservation, and tourism revenue, respondents provided insights that sometimes contrasted with the quantitative findings. Several respondents mentioned community partnership initiatives, including "partnering with local communities," "involving local guides," and "supporting local suppliers." One respondent (Tourist 086) elaborated: *"When adventure tours involve local guides who share indigenous knowledge, it enhances visitor satisfaction while preserving cultural knowledge and providing income to community members."*

Another (Tourist 214) noted: *"Partnerships with local communities have helped develop unique adventure experiences that feel more authentic to visitors, though these partnerships need strengthening."* Cultural preservation efforts were highlighted by multiple respondents, who mentioned "supporting traditional dance performances," "creating cultural immersion tours," "selling handmade crafts," "supporting cultural festivals," and "training staff in local languages." A respondent (Tourist 167) explained: *"Supporting traditional dance performances as part of adventure packages helps preserve cultural practices while enriching*

the tourist experience, but these cultural elements are often treated as add-ons rather than integral components."

Another (Tourist 295) stated: *"Selling handmade crafts at adventure sites provides direct income to artisans while preserving traditional skills, though the quality and authenticity of offerings varies significantly."* Educational components were noted by several respondents, including "providing guided nature walks," "educating visitors on local history," and "local wildlife documentary screenings." One participant (Tourist 132) commented: *"Guided nature walks that include information about local ecology and conservation efforts enhance visitor satisfaction while promoting environmental awareness, though the quality of interpretation is inconsistent."* Another (Tourist 248) mentioned: *"Educating visitors on local history and cultural significance of landscapes deepens their appreciation and connection to the destination, potentially encouraging more respectful behavior."*

Sustainable tourism practices were referenced through "encouraging responsible wildlife viewing" and "promoting local cuisine." A respondent (Tourist 359) noted: *"Guidelines for responsible wildlife viewing help protect natural resources while still providing satisfying visitor experiences, though enforcement is sometimes lacking."* Another (Tourist 173) stated: *"Promoting local cuisine at adventure sites supports local food producers and preserves culinary traditions, but many sites still rely heavily on imported food products."* Cultural exchange opportunities were mentioned through "offering cultural exchange programs."

One respondent (Tourist 301) explained: *"Cultural exchange programs that allow tourists to learn from and interact meaningfully with local communities create memorable experiences while promoting cultural understanding, though these programs remain limited in scope and availability."* In stakeholder interviews, TC emphasized: *"Adventure tourism has potential to diversify Nakuru's tourism economy beyond traditional safaris, creating new revenue streams, but we haven't fully developed or marketed these opportunities."* CTP noted: *"Family bonding through safe adventure experiences can increase visitor satisfaction and encourage longer stays, but safety concerns continue to limit this potential."*

CCG stated: *"Adventure tourism could provide hands-on learning opportunities for students in tourism, building local capacity while enhancing service quality, but educational partnerships remain underdeveloped."* KWS added: *"Revenue-sharing models that benefit local people would strengthen connections between conservation, community development, and tourism, but implementation has been fragmented."* ASP commented: *"Visitor feedback systems could help improve adventure products and increase satisfaction, but most operators lack systematic approaches to collecting and using visitor input for service improvement."*

NEMA observed: *"Environmental impact assessments for adventure activities could ensure sustainability while maintaining visitor appeal, but regulatory frameworks for such assessments are underdeveloped."* NGO emphasized: *"Long-term monitoring of tourism impacts on local communities and ecosystems is essential for sustainable development, but resources and capacity for such monitoring remain limited across most adventure tourism operations."*

4.3 Inferential Analysis

The inferential analysis included correlation and regression analysis. Correlation analysis was conducted to examine the association between each independent variable and the dependent variable (sustainable tourism development). The results are presented separately for each research objective to facilitate clear understanding and potential journal publication extraction.

Table 4 presents the correlation analysis of Types of Adventure Tourism Products and Sustainable Tourism Development.

Table 4: Correlation Analysis of Types of Adventure Tourism Products and Sustainable Tourism Development

Variables	Sustainable Tourism Development	Types of Adventure Tourism Product
Sustainable Tourism Development	1.000	
Types of Adventure Tourism Product	.643**	1.000
Sig. (2-tailed)	0.000	

The correlation analysis revealed that types of adventure tourism products were positively and significantly associated with sustainable tourism development ($r = .643, p = 0.000$). This strong positive correlation indicates that well-structured, unique, and diverse adventure tourism products are directly linked to more effective sustainable tourism outcomes in Nakuru County. This finding aligns with Rojo-Ramos (2020) who found that well-structured trekking tourism activities positively influenced sustainable tourism development through environmental preservation while meeting tourist expectations. The regressions of coefficients results are presented in Table 5.

Table 5: Regressions of Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.203	0.083		2.434	0.015
Types of adventure tourism product	0.315	0.034	0.344	9.398	0.000

$$Y = 0.203 + 0.315X$$

Where: Y = Sustainable Tourism Development; X_1 = Types of adventure tourism product

Based on the regression results presented in Table 5, types of adventure tourism product was found to have a positive and statistically significant relationship with sustainable tourism development ($B = 0.315, p = 0.000$). This implies a one-unit increase in the quality and diversity of adventure tourism products is predicted to increase sustainable tourism development by 0.315 units, holding all other factors constant. This finding aligns with Rojo-Ramos (2020) research which demonstrated how well-structured adventure activities directly influence sustainable tourism outcomes, with their analysis showing that properly designed trekking tourism activities promote environmental preservation while meeting tourist expectations. The regression results in Table 5 reveal that types of adventure tourism product has a positive and statistically significant effect on sustainable tourism development ($\beta = 0.315, t = 9.398, p = 0.000$). Since the p-value is less than 0.05, the null hypothesis is rejected. Hence, types of adventure tourism product has a significant effect on sustainable tourism development in Nakuru County, Kenya.

5.0 Conclusion

The study concludes that the combined influence of types of adventure tourism products, adventure tourism motivators, marketing adventure tourism, and stakeholder collaboration

explains 64.7% of the variation in sustainable tourism development in Nakuru County, demonstrating the multidimensional nature of sustainable tourism implementation challenges. These four determinants interact and reinforce each other, with weaknesses in one area often exacerbating challenges in others: poorly structured adventure products undermine marketing effectiveness; limited understanding of tourist motivations constrains product development; ineffective marketing reduces visibility and participation; and weak stakeholder collaboration impedes comprehensive implementation.

6.0 Recommendations

Based on the findings regarding types of adventure tourism products, the County Government of Nakuru should develop comprehensive guidelines for adventure tourism product development, focusing on safety standards, environmental integration, cultural sensitivity, and inclusivity. These guidelines should be enforced through a certification system that ensures compliance with sustainability criteria. The Tourism Regulatory Authority should establish minimum safety standards for all adventure activities and should require regular safety audits for adventure tourism operators. In addition, the study recommends that adventure tourism operators should invest in improving the structure and definition of their adventure products, developing clear activity descriptions, safety protocols, difficulty ratings, and sustainability components that enhance visitor satisfaction while supporting environmental and cultural conservation. Tour companies should implement standardized safety procedures that should be clearly communicated to all participants before activities begin. Adventure tourism providers should develop different product tiers that should accommodate varying skill levels and physical abilities, ensuring inclusivity and broader market appeal. Operators should integrate educational components into their adventure activities, which should enhance environmental awareness and cultural appreciation among participants. Site managers should conduct regular environmental impact assessments of their adventure activities and should modify operations as needed to minimize negative impacts.

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