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Influence of beach attributes on recreationists' beach preferences: Evidence from Mombasa, Kenya

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Abstract

Purpose: This study examines how beach attributes influence preferences among resident recreationists in Mombasa County, Kenya, and explores how recreationists' characteristics moderate these preferences.

Methodology/approach: A survey of 77 frequent beachgoers (visiting ≥3 times weekly) was conducted at four beaches using enumerator-administered questionnaires. Descriptive statistics profiled demographics, exploratory factor analysis assessed environmental attitudes, conjoint analysis evaluated beach profile preferences (cleanliness, safety, congestion), and binary logistic regression examined moderating effects of demographics and attitudes.

Results/findings: Clean, litter-free, patrolled, and uncrowded beaches were strongly preferred. Heavy litter and the absence of patrols significantly detracted from appeal, while congestion moderately reduced preferences. Gender significantly moderated the influence of congestion, highlighting differing valuations between male and female recreationists. These findings underscore the need for targeted management strategies to enhance beach experiences.

Conclusion: The study reveals that extreme levels of key beach attributes-cleanliness, patrolling frequency, and congestion-significantly influence recreationists' preferences.

Limitations: The cross-sectional design limits insights into the evolution of preferences over time. Longitudinal studies are recommended to assess how environmental education, management changes, and societal norms influence preferences. Additionally, the context-specific findings suggest a need for comparative studies across diverse regions.

Contribution: This study contributes empirical evidence on resident beach preferences, an often-overlooked segment in tourism research. By applying conjoint analysis, it provides nuanced insights into how varying levels of cleanliness, safety, and congestion shape preferences, offering actionable guidance for beach management and policy.

Keywords: *Beach Tourism, Conjoint Analysis, Recreationists Preferences*

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1. Introduction

Beach tourism involves spending leisure time or holidays at the shoreline for relaxation and participation in recreational activities. Houngbeme, Igue, and Cloquet (2021) highlighted that beaches serve as natural, cultural, and aesthetically appealing spaces, offering opportunities for activities such

as sunbathing, swimming, walking, exercising, beach sports, yoga, meditation, and other physical pursuits. Beaches are shorelines that extend from the mean low water level on the foreshore to the backshore vegetation, cliffs, and dunes. Coastal and Marine Tourism (C&MT) plays a crucial role in the global tourism industry, accounting for half of all tourism revenues—USD 4.6 trillion or 5.2% of the global gross value added. Experts recognize C&MT as the fastest-growing segment of international tourism, with beach recreation emerging as one of its most rapidly expanding components (Attri, 2018; Dodds & Holmes, 2019).Thus, beach tourism is a key economic driver and a critical area for sustainable development within the broader context of coastal and marine tourism.

Global beach tourism is witnessing robust growth, fueled by rising disposable income, more leisure time, and a growing preference for coastal destinations (AMR, 2023). The market is expected to reach $357 billion by 2032, with a compound annual growth rate (CAGR) of 5% (AMR, 2023). Urban coastal beaches are becoming increasingly popular because of their accessibility, unique blend of natural beauty, and urban amenities. As a result, they play a vital role in enhancing the economic and social vitality of coastal cities, such as Mombasa in Kenya, contributing significantly to both local economies and tourism industries.

Mombasa, Kenya's leading tourist destination, accounts for over 50% of the country's tourism bed capacity (Akama & Kieti, 2007).Coastal tourism, a critical component of Kenya’s economy, attracts 65% of visitors, with Mombasa as the primary hub for coastal and marine tourism (Bitok, 2019). The coastline, stretching from Nyali to Mtwapa in Kilifi County, features four public beaches: Nyali, Jomo Kenyatta, Mombasa, and Shanzu Beach. These beaches vary in terms of safety, facilities, sand quality, aesthetics, cleanliness, and recreational use. Although beach tourism is a major attraction, there are limited high-resolution data on the factors driving demand for beach recreation among residents. This gap underscores the need for detailed research on resident preferences.

The ecosystem structure of beaches varies, leading to distinct biogeographical characteristics. Barbosa de Araújo and da Costa (2008),in their analysis of studies conducted between 1997 and 2007, identified several natural attributes used to categorize beaches. These include sea-front topography, sand color, habitat diversity, marine debris accumulation, and the presence of jellyfish species. In contrast, anthropogenic factors such as beach cleanliness, water quality, safety, accessibility, public recreational facilities, hospitality amenities, and beach congestion also vary significantly. These factors are frequently regarded as important beach characteristics by researchers (Botero, Tamayo, Zielinski, & Anfuso, 2021; Tudor & Williams, 2006; Williams, Rangel-Buitrago, Pranzini, & Anfuso, 2018).The concept of utility, introduced by Marshall (1890), forms the foundation for understanding consumer preferences for commodities, including tourist experiences such as beach recreation. Kucukusta and Guillet (2014) define consumer preference as individual tastes assessed based on the utility assigned to various bundles of commodities. Lancaster (1966) expanded on this idea by linking utility, consumer preferences, and the characteristics of goods. Researchers generally agree that variations in shoreline ecosystems, in terms of geophysical and ecological characteristics, lead to differences in beach attributes, such as usage, cleanliness, and security. Dodds and Holmes (2019) emphasized that these differences may significantly influence recreationists' experiences and preferences for specific beaches.

However, most studies on coastal and marine tourism (Dodds & Holmes, 2019; Houngbeme et al., 2021) primarily examine the preferences of international tourists and non-resident holidaymakers. This focus has created an empirical gap in understanding the preferences and choices of domestic recreationists, who likely represent the majority of beach-goers. Consequently, there is limited understanding of the specific values that local beachgoers place on beach attributes, such as cleanliness, safety, and congestion. This gap has practical implications, as beach managers lack the necessary insights to prioritize the characteristics that matter most to domestic users. By focusing on the preferences of domestic recreationists, this study addresses this gap, offering a fresh perspective beyond tourist-centric analyses.

Recent studies on tourist preferences for beach attributes have predominantly focused on the presence or absence of specific features, often neglecting variations within these attributes, such as differing

levels of cleanliness or congestion (Boto-García & Leoni, 2023; Oh, Draper, & Dixon, 2009). Furthermore, these studies have not explored the trade-offs beach users make between varying levels of attributes. This methodological limitation hinders a comprehensive understanding of how tourists select the beaches. To address this gap, the current study employs conjoint analysis to investigate how varying levels and combinations of three key beach attributes—congestion, cleanliness, and safety—influence recreationists' preferences. This approach provides a nuanced understanding of decision-making processes, offering valuable insights into beach management and tourism policy development.

This study examines the influence of beach attributes—cleanliness, safety, and usage levels—on the preferences of resident recreationists in Mombasa County, Kenya. It also evaluates the moderating effects of demographic factors and environmental attitudes. Following the introduction, the literature review section explores the theoretical foundations, including consumer preference theories, and reviews empirical studies on key beach attributes. Based on this, hypotheses were formulated regarding the relationships between these attributes and preferences. The paper then outlines the research design, data collection methods, and analysis techniques, followed by a discussion of the results. Finally, this study concludes with recommendations for beach management, policy development, and sustainable tourism practices in Mombasa.

2. Literature Review

2.1 Theoretical Review

2.1.1 Consumer Utility Theory

Marshall (1890) posited that rational consumers allocate their income toward goods and services that maximize their satisfaction(Marshall, 1890). His theory defines consumer satisfaction in terms of measurable utility and suggests that individuals make choices based on preferences constrained by the prices of commodities and their income levels (Levin & Milgrom, 2020). According to this framework, the total utility of a composite commodity, such as a beach experience, is the sum of the utilities derived from its individual components, including the beach, transportation, safety, and other services enjoyed during the visit (Levin & Milgrom, 2020; Marcin, 1993). In line with utility theory, this study treats the beach recreation experience as a composite commodity, where consumers assign utility to its various attributes.

2.1.2 Lancaster's Goods Characteristics Theory

Building on Consumer Utility Theory, Lancaster (1966) introduced an alternative approach, positing that consumers are motivated not by the goods themselves but by the utility derived from the attributes of those goods (Kucukusta & Guillet, 2014). Similar to the neoclassical consumer utility theory, Lancaster's characteristics theory assumes that rational consumers seek to maximize utility within a budget constraint. However, it diverges by deconstructing goods into distinct attributes (Lancaster, 1966). Consumers then make choices based on the utility derived from these attributes. Studies have emphasized the importance of tourism product attributes in shaping the preferences of tourists. For instance, Ranasinghe, Kumudulali, and Ranaweera (2019) demonstrate that park attributes significantly influence visitor preferences and satisfaction in Sri Lankan parks. In this study, Lancaster's model was applied to examine beach recreationists' preferences for specific beach attributes when selecting their preferred beach.

2.2 Empirical Review and Hypothesis Development

2.2.1 Beach Attributes and Beach Recreationists' Preferences

The literature suggests that beach attributes, such as cleanliness, significantly influence recreationists' beach choices and satisfaction. Studies have demonstrated that beach cleanliness affects user preferences across diverse locations (Oh et al., 2009; JM Penn, 2013; Tudor & Williams, 2006). For example, Mensah (2021) found that sanitation and security were critical factors influencing overall satisfaction in a survey of 497 visitors to Ghana's Kokrobite Beach. However, these studies reveal inconsistent findings regarding the direction of cleanliness' impact, suggesting that its influence may vary by user segment and location (Mensah, 2021; Tudor & Williams, 2006). Building on this empirical evidence, this study hypothesizes that beach attributes, particularly cleanliness, defined by levels of litter, significantly affect resident beach recreationists' satisfaction during their visits and engagement

in activities. This hypothesis aligns with Lancaster's characteristics theory (1971), which emphasizes the role of attributes in shaping consumer satisfaction with products or services.

H_1: *Beach cleanliness significantly influenced resident beach recreationists' preference for beaches in Mombasa County, Kenya.*

A secure beach environment is essential for personal well-being and a positive beach experience, enabling recreationists to engage in activities such as swimming without fear.. Research underscores the crucial role of beach safety in influencing the preferences of beach users. For example, Mensah (2021) highlighted the importance of security and cleanliness in enhancing satisfaction at Ghana's Kokrobite Beach. Similarly, Das and Bhattacharya (2021) found that factors such as beach scenery, amenities, beach typology, and security shape tourists' perceptions and overall experience in West Bengal, India. They specifically emphasized the significance of beachgoers' perceptions of safety and security when choosing beaches for recreational activity. Based on this evidence, this study hypothesizes that beach safety, as measured by the frequency of beach patrols, significantly impacts the preferences of resident beach recreationists in Mombasa County.

H_2: *Beach safety significantly influences resident beach recreationists' preference for beaches in Mombasa County, Kenya*

Beach congestion, representing disutility, can negatively influence preferences by diminishing the overall utility of a beach visit. In crowded settings, recreationists may experience discomfort, limited space, and reduced privacy, leading to lower satisfaction levels (Lopez-del-Pino & Grisolía, 2018). Studies indicate that high congestion levels can deter visitors, as the adverse effects of overcrowding often outweigh the benefits of other beach attributes (JM Penn, 2013). For instance, Jerrod Penn, Hu, Cox, and Kozloff (2016) found that while congestion was less influential in determining beach choice, residents exhibited a lower willingness to pay (WTP) for beach activities due to overcrowding. Additionally, the trade-off between overcrowding and other desirable attributes such as cleanliness and safety can further shape beach preferences (Dodds & Holmes, 2019). Building on this evidence, the study hypothesizes that beach usage levels, measured by congestion, significantly influence the preferences of resident beach recreationists in Mombasa County.

H_3: *Beach usage level significantly influenced resident beach recreationists' preference for beaches in Mombasa County, Kenya.*

2.2.2 Beach Recreationists' Attributes and Beach Preferences

Studies by JM Penn (2013) and Li and Hudson (2016) identified recreationists' demographics as direct determinants of beach preferences. In contrast, Wolch and Zhang (2004) and (de Oliveira, Chamorro-Mera, & Lourenço, 2013) emphasize the direct influence of recreationists' environmental attitudes on beach choices. Collectively, these findings highlight how demographics, such as gender, shape preferences to align with individual needs. For instance, males may favor vibrant and active beach environments, whereas females may prefer serene and peaceful settings. Furthermore, environmental attitudes, which encompass beliefs and values related to nature, significantly influence beach preferences. Individuals with strong environmental consciousness tend to prioritize clean and ecologically sustainable beaches (de Oliveira et al., 2013; Li & Hudson, 2016; Wolch & Zhang, 2004). To examine the role of demographics and environmental attitudes in Mombasa County, Kenya, the study hypothesizes that resident beach recreationists' demographics and environmental attitudes significantly moderate the influence of beach attributes on their preferences for beaches in the study area.

H_4: *The demographics and environmental attitudes of resident Beach recreationists significantly moderated the influence of beach attributes on recreationists' beach preference in Mombasa County, Kenya.*

The reviewed literature suggests that beach attributes such as cleanliness, safety, and congestion significantly influence beach recreationists' preferences. This aligns with Lancaster (1966) Goods Characteristics Theory, which posits that consumers derive satisfaction from specific attributes of a product or service rather than the product itself. Studies by JM Penn (2013)and Mensah (2021) demonstrated that cleanliness, safety, and beach usage levels (congestion) shape beachgoers'

satisfaction and decision-making. These findings support the Consumer Utility Theory, emphasizing the subjective nature of satisfaction based on individual evaluations of the utility derived from beach attributes. Additionally, the studies indicate that preferences vary based on user demographics and environmental attitudes, further highlighting the dynamic and personal nature of these preferences. Consequently, this study hypothesizes that beach attributes and individual characteristics significantly influence the preferences of resident beach recreationists in Mombasa County, Kenya. Figure 1. presents a conceptual diagram of the hypothesized relationships between the study variables.

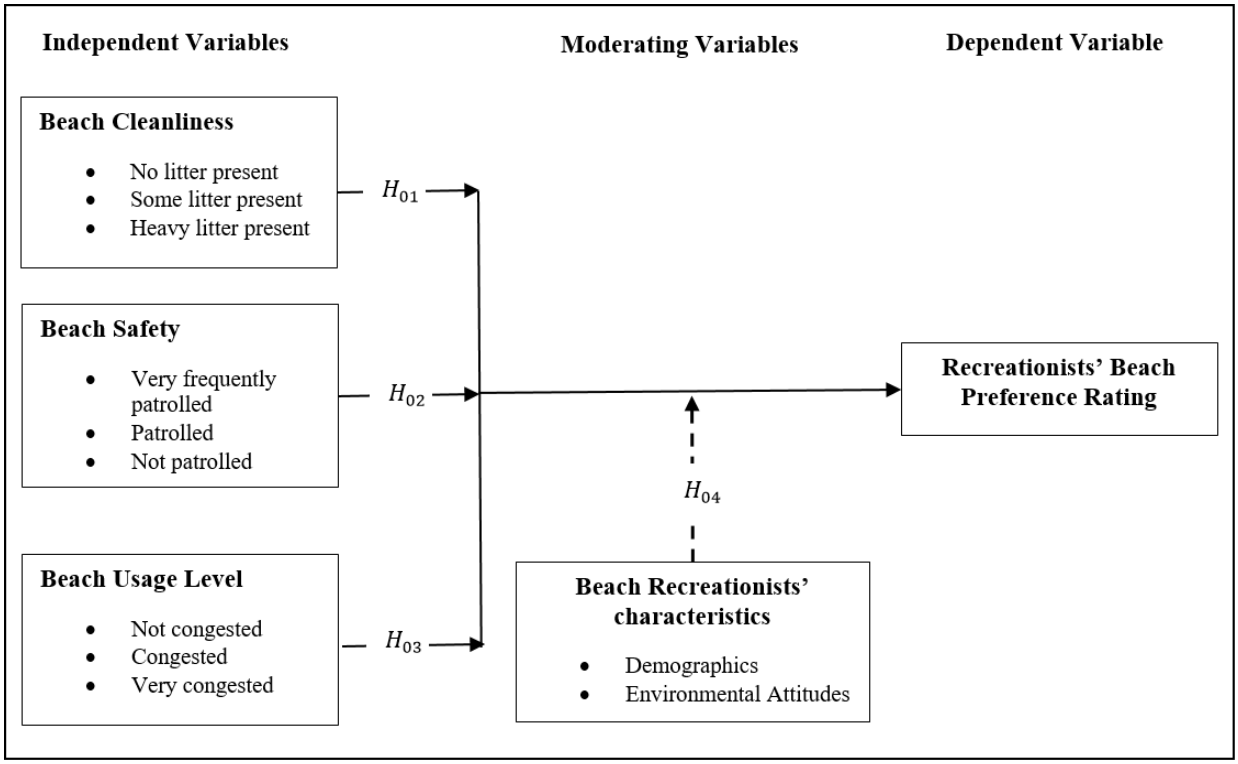

Figure 1. Conceptual Framework: Beach Attributes and Recreationists' Beach Preferences in Mombasa

3. Research Methodology

3.1 Sampling and Data Collection

The study employed a survey design to collect data from a cross-section of adult resident beach recreationists in Mombasa County who visit the beach for leisure at least three times a week (Mateer et al., 2021). The target population was estimated to be 60,000 residents, representing 5% of the county's total population of 1.2 million. Using the sample size formula for conjoint analysis studies with populations ranging between 50,000 and 100,000, a sample size of n = 81 was determined (Eqn. 1).

$$n = \frac{N\frac{z^2 p(1-p)}{e^2}}{\frac{z^2 p(1-p)}{e^2} + N - 1} \quad \text{(Eqn. 1)}$$

Where: n = Sample size; N = Population size; z = Confidence level; p = Sample proportion; e = Margin of error.

Following Salubre, Bahalla, and Almagro (2024), this study employed simple random sampling to recruit resident beach recreationists from four beaches in Mombasa. This approach proved effective for efficiently and cost-effectively gathering quantitative stated preference data from a population that lacked a readily available sampling frame. In line with Kucukusta and Guillet (2014), data were collected through enumerator-administered questionnaires at the Jomo Kenyatta, Nyali, Bamburi, and

Shanzu Public Beaches on the North Coast. Data collection spanned 14 days, from November 9th to 22nd, 2024, with efforts made to ensure a diverse representation of beachgoers by administering questionnaires on weekdays and weekends.

The questionnaire consisted of closed-ended questions divided into three sections. The first section collected data on respondents' demographics, including age, employment status, and civil status of the respondents. The second section gathered information on the frequency and types of beach recreation activities through multiple choice questions. Following (Kamwendo & Maharaj, 2022), the third section assessed respondents' preferences for beach profiles. These profiles were constructed using three key attributes—cleanliness, safety, and usage level—to evaluate their influence on beach recreationists' preferences in Mombasa County, Kenya. A pilot study was conducted at Shelly Beach in the Likoni area of Mombasa with ten respondents to refine and validate the questionnaire (Uddin, 2020). The attributes and their respective levels are listed in Table 1.

Table 1. Beach Attributes and their Levels

Beach Attribute	Level	Relationship with utility
Beach Cleanliness	No litter present	
	Some litter present	(-/+)
	Heavy litter present	
Beach Safety	Very frequently patrolled	
	Patrolled	(-/+)
	Not Patrolled	
Beach Usage Level	Not congested	
	Congested	(-/+)
	Very congested	

Source: Research Data (2024)

Using the three attributes and their respective levels (Table 3.1), the total number of possible beach profile combinations was calculated as $3 \times 3 \times 3 = 27$ beach profiles. To streamline the respondent assessment, the study employed an orthogonal factorial design using SPSS, generating 21 beach profiles: 16 design profiles and 5 holdout profiles. Surveyed recreationists rated their preferences for these hypothetical profiles, each featuring varying levels of beach attributes, on a 5-point Likert scale (1 = "not at all preferred," 5 = "extremely preferred"). The final section of the questionnaire measured respondents' environmental attitudes using a 5-point Likert scale (Rülke, Rieckmann, Nzau, & Teucher, 2020). To profile beach recreationists, the study utilized the New Ecological Paradigm (NEP) environmental attitude scale proposed by (Gifford & Sussman, 2012)

3.2 Data Analysis

Descriptive statistics were applied to profile beach recreationists based on their demographic attributes, calculating frequency counts and percentages for categories such as gender, civil status, employment, income, and residence. Environmental attitudes were analyzed using exploratory factor analysis (EFA) with principal component analysis (PCA) to identify underlying dimensions (Supheni, Ivada, Novianti, & Wiwin, 2023). The EFA assessed factor loadings (λ), providing insights into the shared environmental perspectives of beachgoers. This study employed conjoint analysis (CA) to evaluate the influence of beach attributes—cleanliness, safety, and usage level—on recreationists' preferences. The validity of the model was assessed using Kendall's tau for the holdout beach profiles, which confirmed the reliability of the estimates. Hypotheses regarding the influence of beach cleanliness (H_{01}), safety (H_{02}), and usage level (H_{03}) on preferences were tested using utility estimates derived from the CA model. Following Tripathi and Siddiqui (2010), the moderating influence of demographic attributes (gender) and environmental attitudes on beach preferences (H_{04}) was examined using binary logistic regression. All analyses were conducted using SPSS (version 20).

4. Results and Discussion

4.1 Demographic Profile and Participation in Beach Recreation

Of the 81 questionnaires distributed, 77 were fully completed and usable for the conjoint analysis, achieving a 95% response rate. The sample size and response rate were deemed sufficient for the study's conjoint analysis requirements. Table 2. presents the descriptive statistics of beach recreationists' demographics.

Table 2. Demographic Profile of the Resident Beach Recreationist in Mombasa

Demographic Characteristics		Frequency	Percentage
Gender	Male	39	50.65
	Female	38	49.35
Civil Status	Single	64	83.12
	Married	8	10.39
	Widowed	5	6.49
Employment Status	Employed	16	20.78
	Unemployed	5	6.49
	Student	52	67.53
	Self-Employed	2	2.60
	Retired	2	2.60

Source: Research Data (2024)

The demographic profile (Table 4.1) reveals that 51% of participants were male and 49% female, reflecting a balanced gender representation consistent with Mombasa's population (Kenya National Bureau of Statistics. Most recreationists (83%) were unmarried, and 68% were students, indicating a predominantly young and single demographic with ample time for active beach activities. These findings align with Mensah (2021) study at Kokrobite Beach, Ghana, where 70% of users were under 30 years of age and 73% were unmarried. Regarding beach visit frequency, 66% of respondents visited the beach less than twice a week, while 30% were avid beachgoers visiting three to five times weekly. This frequent exposure suggests that they are well-acquainted with beach attributes, providing valuable insights for the conjoint analysis. Similarly, JM Penn (2013), in a Hawaiian study, used visit frequency as a criterion for participant suitability in beach attribute choice experiments.

Respondents identified multiple beaches visited in the past three months, revealing variations in their popularity (Figure 2). Nyali and Mombasa beaches recorded the highest number of visits compared to Shanzu and Jomo Kenyatta Beach. These results provide a basis for investigating whether this variation in popularity reflects differences in perceived beach attributes, with recreationists favoring beaches that offer ideal cleanliness, sufficient security, and manageable congestion.

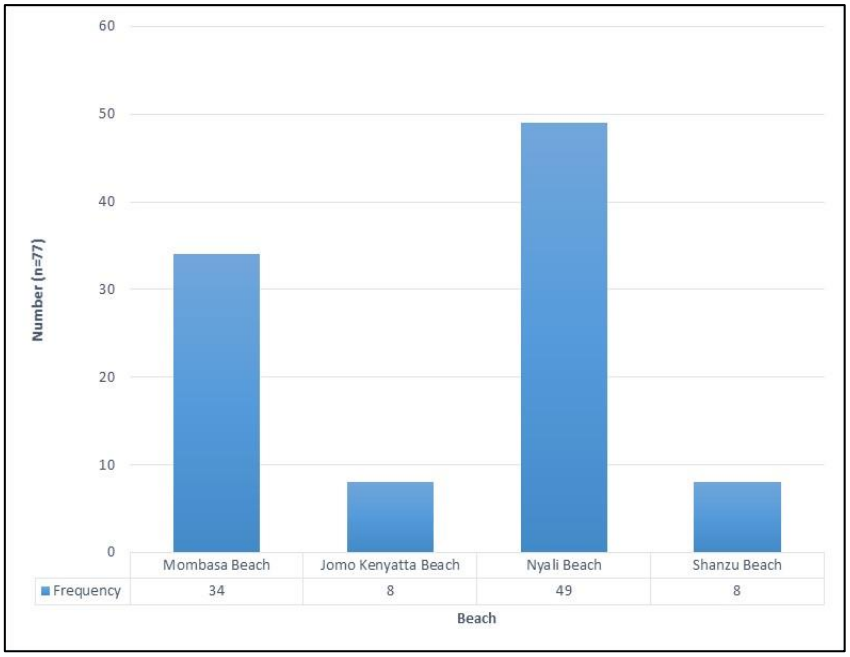

Figure 2. Frequency of Beaches Visited in Mombasa
Source: Research Data (2024)

4.2 Beach Recreationist Environmental Attitudes

The results of the exploratory factor analysis (EFA) revealed the underlying structure of beach recreationists' environmental attitudes and were used to construct a scale for profiling respondents' psychographics. Table 3. presents the factor loadings from the EFA. Based on Gifford and Sussman (2012) New Ecological Paradigm (NEP) scale, the findings are presented in Table 3. illustrates the spectrum of environmental attitudes, ranging from ecocentrism to indifference. The first factor, labeled Environmental Concern, reflects emotional attachment to environmental issues. The second factor, Interconnectedness with Nature, highlights awareness of human-nature interdependence. The third factor, Dependence on Nature, emphasizes human reliance on nature for survival. The fourth factor, Skepticism towards Environmental Issues, indicates doubt about environmental matters. Profiling revealed that 51% of beach recreationists expressed environmental concern, 43% showed indifference, and 14% were skeptical. These diverse attitudes align with the tourism literature, which suggests that tourists' environmental attitudes influence their behavior and destination choices (Liu, Zhao, & Jang, 2021).

Table 3. Factor Loading for Beach Recreationists' Environmental Attitudes

Statement	**Factor Loading**			
	1	**2**	**3**	**4**
It saddens me to see natural environments cleared for development	.649			
Science and technology will eventually not solve our environmental problems	.608			
Being out in nature is a great stress reducer for me	.592			
I am worried that loss of biodiversity can lead to reduction of human benefits	.543			
I can enjoy spending time in natural settings	.444			
One of the most important reasons to conserve is to preserve nature		-.700		
Environmental degradation denies future generation enjoyment of the natural resources		.688		

Human are as much a part of the ecosystem as other animals	.538		
It bothers me that humans are running out of their supply of natural resources	-.504		
I do not feel that humans are dependent on nature to survive		-.727	
We need to preserve resources to maintain a high quality of life		.715	
We need to keep beaches clean is so that people have a place to enjoy		.488	
The most important reason for conservation is human survival		.460	
Most environmental threats have been exaggerated			.746
It seems to me that most conservationists are pessimistic and paranoid			.683
I find it hard to get too concerned about environmental issues			.516

Source: Research Data (2024)

4.3 Conjoint Analysis Model Estimation and Diagnostics

Following Tripathi and Siddiqui (2010), the analysis estimated a linear additive utility model, where the dependent variable was the i^{th} recreationist's preference rating of the j^{th} beach profile, and the independent variables were the l^{th} level of the k^{th} attribute present in the j^{th} beach profile. Equation 2 reflects the resulting model estimated using the ordinary least squares (OLS) regression algorithm:

$$y_{ij} = \sum_{k=1}^{k} \sum_{l=1}^{L_k} \beta_{ikl} \cdot x_{jkl} + \varepsilon_{ij} \quad \text{Eqn. 2}$$

Where:

y_{ij} = the utility provided by the j^{th} beach recreation profile to a representative beach recreationist - i;

$i =$ The number of beach recreationalists;$i = 1,2,\cdots,77$;

$j =$ The number of profiles;$j = 1,\cdots,21$;

$K =$ The number of attributes; $k = 1,\cdots,3$;

L_k = The number of levels of the k^{th} attribute,$L_k = 1,\cdots,3$;

x_{jkl} = 1, if the l^{th} level of the k^{th} attribute is present in the j^{th}beach profile, x_{jkl} = 0, otherwise.

Before estimating the conjoint analysis (CA) model, we assessed pairwise correlations between recreationists' preference scores for the 21 beach profiles using Pearson's correlation. The analysis revealed weak to moderate correlations ((|r|≤.54, p<.01), indicating no risk of multicollinearity. Furthermore, the CA model results showed strong positive correlations between observed and estimated preferences, with Pearson's R = .97 and Kendall's tau = .88, both statistically significant (p < .05). These high correlations suggest that the model accurately captured respondents' preferences based on the presented attribute levels. Additionally, Kendall's tau for the holdout sample (τ = .800, p = 0.03) further confirmed the reliability and generalizability of estimated preferences. Overall, these findings demonstrate the validity and robustness of the conjoint analysis methodology in predicting preferences in the study context. Table 4. presents the linear additive utility model results (Eqn2), showing how beach attribute levels influence recreationists' preferences for beach profiles. These results were used to test the study hypotheses.

Table 4. Influence of Beach Attributes on Recreationists' Preferences in Mombasa County

Beach Attribute	Level	Utility Estimate	Std. Error	t-stat	p-value

Beach Cleanliness	No litter present	.733	.072	10.20	< 0.01
	Some litter present	.005	.084	0.06	0.95
	Heavy litter present	-.738	.084	-8.77	< 0.01
Beach Security	Very frequently patrolled	.172	.072	2.40	0.02
	Patrolled	.125	.084	1.49	0.14
	Not patrolled	-.297	.084	-3.53	<0.01
Beach usage Level	Not congested	.337	.072	4.69	< 0.01
	Congested	-.217	.084	-2.58	0.01
	Very congested	-.120	.084	-1.42	0.16

Source: Research Data (2024)

4.4 Hypothesis Tests

4.4.1 The Influence of Beach Cleanliness on Resident Beach Recreationists' Preferences

The analysis of part-worth utilities for beach cleanliness (Table 4) reveals significant findings: the absence of litter ($\beta_{11} = 0.73, t_{74} = 10.20, p < .01$) and the presence of heavy litter ($\beta_{13} = -0.74, t_{74} = -8.77, p < .01$) both significantly influenced beach recreationists' preferences (α = .05). However, the study found insufficient evidence to reject the null hypothesis for the presence of some litter, indicating no significant influence on preferences (α = .05). Figure 4.2 illustrates the average utility estimates for the three levels of beach cleanliness rated by the recreationists in Mombasa.

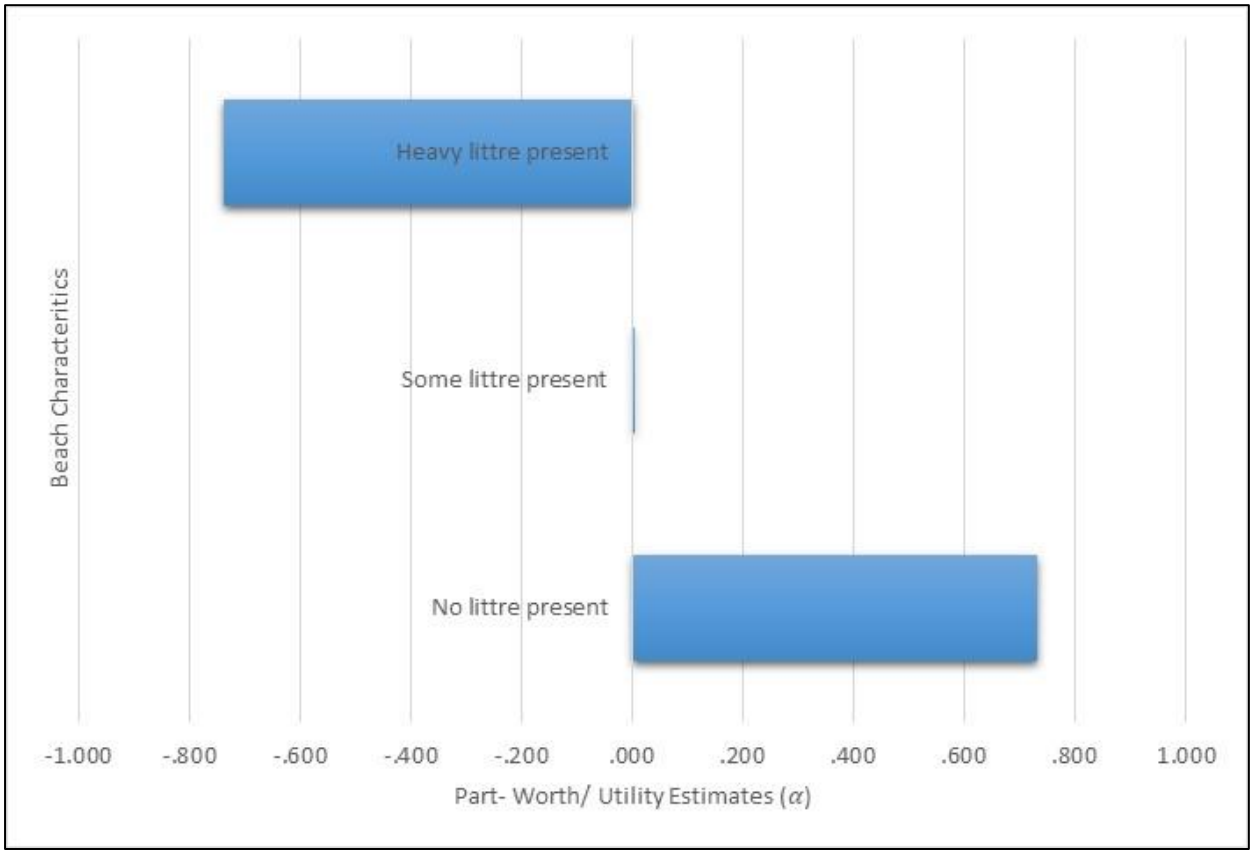

Figure 3. Utility Estimates for Levels of Beach Cleanliness
Source: Research Data (2024)

The heavy presence of litter emerged as the most influential factor in beach recreationists' preferences, negatively predicting higher ratings (β_{13} = -0.74, *SE* = 0.08). In contrast, the absence of litter positively predicted preferences (β_{11} = 0.73, *SE* = 0.07) (Figure 4.2). These findings confirm that cleanliness, particularly the presence or absence of litter, significantly shapes recreationists' preferences. These

results align with Mensah (2021) findings, which demonstrated that beach sanitation significantly influenced visitors' evaluations and overall satisfaction at Kokrobite Beach in Accra.

4.4.2 The Influence of Beach Safety on Resident Beach Recreationists' Preferences

The results in Table 4. reject the null hypothesis that beach safety has no significant influence on beach preference. The part-worth estimates for a very frequently patrolled beach ($\beta_{21} = 0.17, t_{74} = 2.50, p < .05$) and an unpatrolled beach ($\beta_{23} = -0.28, t_{74} = -3.53, p < .01$) were significantly different from zero. However, insufficient evidence was found to reject the null hypothesis for the presence of some patrol ($\beta_{22} = 0.13, t_{74} = 1.49, p = .14ns$). Figure 4.3 illustrates the average utility estimates for the three beach security levels rated by the Mombasa beach recreationists.

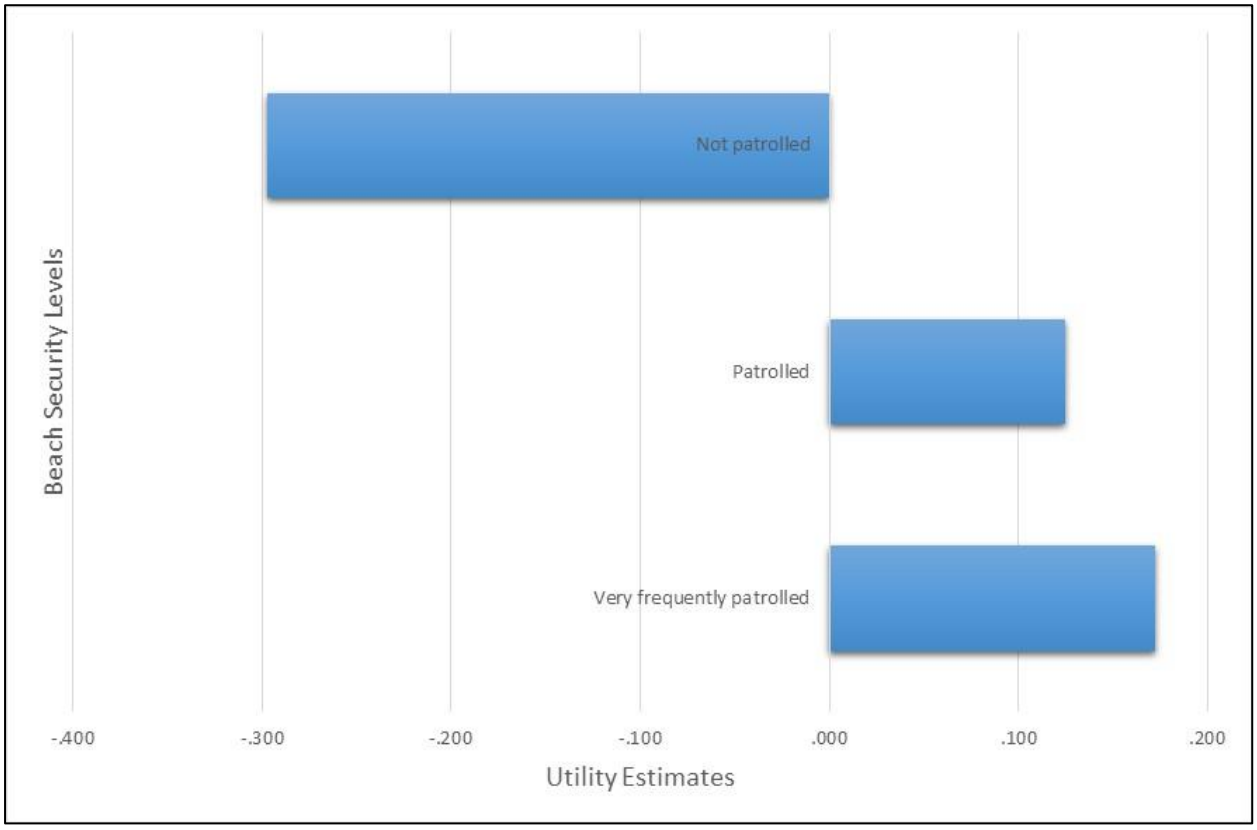

Figure 4. Utility Estimates for Levels of Beach Safety
Source: Research Data (2024)

Figure 4. confirms that perceived inadequate security, indicated by a lack of patrols, was the most significant deterrent for beach preferences among Mombasa's resident recreationists. Figure 4 shows that the absence of patrols negatively affected beach utility for recreation (β_{23} = -0.28, *SE* = 0.08), whereas frequent patrols positively influenced preferences (β_{21} = 0.13, *SE* = 0.08). These results underscore the importance of security in shaping beachgoers' satisfaction and choices. These findings align with Das and Bhattacharya (2021), who identified security as a critical factor in beach walkability and emphasized the need for increased patrols to enhance safety and improve recreational experiences.

4.4.3 The Influence of Beach Usage Level on Resident Beach Recreationists' Preferences

The study found sufficient evidence to reject the null hypothesis regarding the influence of beach congestion on recreationists' preferences. The absence of congestion ($\beta_{31} = 0.34, t_{74} = 4.69, p = .01$) and moderate congestion ($\beta_{32} = -0.22, t_{74} = -2.58, p < .05$) significantly influenced preferences, while very congested beaches did not ($p > .05$) (Table 4). Figure 5. illustrates the average utility estimates for the three levels of beach usage, as rated by Mombasa's beach recreationists.

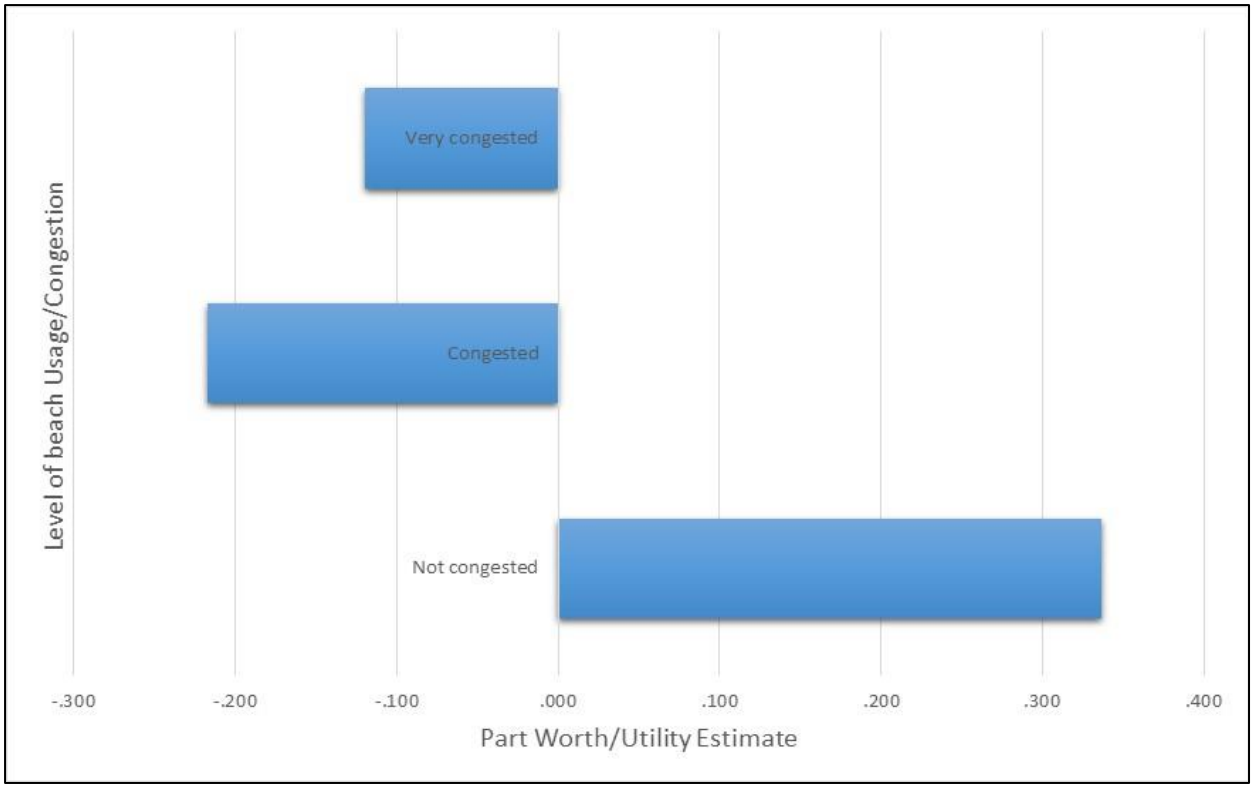

Figure 5. Utility Estimates for Levels of Beach Usage
Source: Research Data (2024)

Figure 5. illustrates that beaches with low congestion significantly enhanced recreationists' preferences, with no congestion contributing to the highest utility (β31 = 0.34, SE = 0.07). In contrast, both moderately (β32 = -0.22, SE = 0.08) and very congested beaches (β33 = -0.12, SE = 0.08) negatively impacted beach preferences. These findings align with Jerrod Penn et al. (2016), who observed that beach congestion influences preferences, noting that residents tend to prefer less crowded beaches and are less willing to pay for beach activities when they are overcrowded. Similarly, tourists favor moderately crowded beaches, underscoring the importance of managing congestion to enhance beachgoer satisfaction and experience.

4.4.4 The Moderating Influence of Beach Recreationists Demographics and Environmental Attitudes and On the Preference of Beach Attributes

The fourth objective was to assess how recreationists' characteristics in Mombasa moderate the influence of beach attributes on their preferences. Binary logistic regression models (Equation 3) were used to examine how these characteristics—including gender and environmental attitude scores (environmental concern, interconnectedness with nature, dependence on nature, and skepticism)—moderated beach preference utility (part-worth) scores for the nine beach attributes.

$$\ln\left(\frac{P(l-1)}{1-P(l-1)}\right) = \beta_0 + \beta_1 g + \beta_2 EA_1 + \beta_3 EA_2 + \beta_4 EA_3 + \beta_5 EA_4 \quad \text{Eqn. 3}$$

Where:
$P(l-1)$ =probability of the beach attribute level (l) being equal to 1;
g = gender (male, female);
EA_1= Environmental attitude index for environmental concern.
EA_2= Environmental attitude index of interconnectedness with nature.
EA_3= Environmental attitude index of dependence on nature;
EA_4= Environmental attitude index for skepticism towards Environmental Issues
β_0 = the intercept term;
β_1 to β_5 = the coefficients associated with the independent variables.

The results of the binary logistic regression models are shown in Table 5. The findings indicate that most beach attribute preferences were not significantly influenced by gender or environmental attitudes, with seven of the nine models being insignificant. However, two models—preferences for congested beaches ($\chi^2(5) = 12.54, p > .05$) and very congested beaches ($\chi^2(5) = 17.17, p < .01$)—yielded significant results. Model 8 revealed that men were 2.81 times more likely to prefer more congested beaches (Exp(β) = 2.81, Wald = 4.07, $p < .05$), suggesting that men favor vibrant, social beach environments, whereas women prefer quieter, less congested settings. Model 9 showed that individuals concerned about the environment were 0.33 times less likely to prefer very congested beaches (Exp(β) = 0.33, Wald = 4.19, $p < .05$), indicating a preference for quieter, more ecologically preserved beaches. Conversely, individuals who felt interconnected with nature were more likely to prefer very congested beaches (Exp(β) = 6.22, Wald = 10.59, $p < .01$), suggesting that they valued socialization and community in highly populated beach settings.

The findings from the binary logistic regression models in this study suggest distinct preferences for beach environments based on gender and attitude toward the environment. The preference for more congested beaches among males aligns with previous research, such as that of Jerrod Penn et al. (2016), who found that men often preferred busier beaches with greater opportunities for social interactions. Similarly, Das and Bhattacharya (2021) highlighted the social appeal of crowded beaches, noting that men tend to prioritize vibrant beach environments over more serene settings.

In contrast, the results indicate that individuals concerned about the environment were less likely to prefer highly congested beaches, suggesting a preference for quieter, more ecologically preserved spaces. This finding aligns with Liu et al. (2021), who demonstrated that environmentally conscious individuals often avoid crowded areas to minimize their ecological footprint and preserve natural settings.

However, individuals who felt interconnected with nature preferred very congested beaches. This result contrasts with typical findings in beach studies, where a connection to nature generally correlates with a preference for less crowded environments (Jerrod Penn et al., 2016). This suggests that some individuals who feel connected to nature may still value the social and communal aspects of crowded spaces, viewing the beach as a venue for both personal connection with nature and social interaction. This is consistent with the research by Kil, Holland, and Stein (2014), who found that social and environmental motivations can coexist in leisure choices.

Table 5. Results of Logistic Regression Models For Beach Attribute Levels

Model No.	**Independent Variables ($Exp\ (\beta)(Wald)$)**						**Omnibus Test for model Coefficients**
	Constant	**Gender**	**Environmental concern**	**Interconnectedness with Nature**	**Dependence on Nature**	**Skepticism towards Environmental Issues**	**Chi-square (*p*-value)**
1. No litter present	- 1.02 (3.28)	1.04 (0.01)	0.80 (0.214)	0.43 (2.89)	0.94 (0.015)	0.89 (0.06)	3.47 (0.63)
2. Some litter present	- 0.32 (0.37)	1.21 (0.16)	2.50 (3.71) *	0.85 (0.12)	1.16 (0.10)	0.8 (2.1)	4.40 (0.49)

3. Heavy litter present	- 0.83 (2.44)	0.72 (0.48)	1.69 (1.21)	1.84 (1.34)	1.44 (0.60)	1.00 (0.00)	3.71 (0.59)
4. V. Freq. patrolled	- 0.05 (0.01)	1.41 (0.50)	1.22 (0.16)	0.84(0.13)	1.08(0.03)	0.34(4.77)*	6.23(0.28)
5. Patrolled	- 0.44 (0.66)	0.61 (1.05)	2.54 (3.63)	2.08 (2.11)	1.30 (0.30)	0.55 (1.42)	6.83 (0.23)
6. Not patrolled	-0.27 (0.26)	1.24 (0.90)	0.49 (2.20)	1.12 (0.06)	0.89 (0.06)	2.76 (4.11)*	6.40 (0.27)
7. Not congested	0.57 (1.12)	0.84 (0.13)	1.54 (0.81)	0.)41 (3.32)	0.58 (1.29)	1.29 (0.26)	6.03 (0.30)
8. Congested	-0.18 (0.10)	2.81 (4.07)*	0.48 (2.10)	0.61 (0.91)	2.13 (2.17)	0.59 (2.94)	12.54 (0.03)*
9. Very congested	- 0.57 (0.99)	0.93 (0.02)	0.33(4.19)*	6.22 (10.59)**	0.76 (0.27)	0.74 (0.28)	17.17 (<0.01)**

*Significant at the 0.05 level, ** Significant at the 0.01 level

5. Conclusion

This study aimed to analyze the influence of beach attributes on the preferences of resident recreationists in Mombasa County, Kenya. Specifically, it examined the impact of attributes such as cleanliness, safety, and usage levels on beach preference. Additionally, this study explored how recreationists' gender and environmental attitudes moderated the relationship between beach attributes and preferences.

The findings support the conclusion that specific beach attributes, particularly at extreme levels, significantly influence recreationists' preference ratings for different beach profiles. Key attributes, such as cleanliness, frequency of patrolling, and congestion levels, were found to have a notable impact on preferences. A litter-free beach was strongly preferred, whereas the presence of heavy litter significantly reduced preferences. Frequent patrolling positively influenced the preferences, whereas the absence of patrols diminished them. Noncongested beaches were rated more favorably, whereas higher congestion levels slightly lowered preference ratings.

Although recreationist attributes such as gender and environmental attitudes generally did not alter the influence of beach attributes on preference ratings, gender significantly moderated the impact of beach congestion. This suggests that male and female recreationists may value congestion levels differently. Overall, the findings indicate a preference for clean, patrolled, and uncrowded beach environments, with gender-based differences in the importance of these attributes.

5.1 Originality

This study contributes novel empirical evidence on the factors influencing beach recreation demand among residents, a segment often overlooked in the existing tourism literature. By focusing on local beachgoers, this study provides insights into the specific values they place on critical beach attributes such as cleanliness, safety, and congestion. Additionally, this study addresses a key methodological gap in previous research, which has typically modeled the presence or absence of beach features. By utilizing conjoint analysis, this study extends beyond this approach to capture how varying levels of beach attributes influence recreationists' preferences. This innovative methodology enabled the

examination of the implicit trade-offs that beach users make when choosing between different beach profiles.

The findings not only enhance the understanding of local beach preferences but also offer actionable insights for beach managers and policymakers seeking to improve beach experiences and attract a broader range of visitors to the beach.

5.2 Limitations

The study's cross-sectional design enabled the analysis of recreationists' preferences at a specific point in time but limited the ability to capture the dynamic nature of these preferences over time. To address this limitation, future research should adopt a longitudinal approach. Such studies would provide valuable insights into how preferences evolve as beach attributes change owing to management interventions. Additionally, a longitudinal design would allow researchers to examine how exposure to environmental education, events, and shifting societal norms influences beach recreationists' attitudes and, subsequently, their preferences and choices regarding beach recreation.

Furthermore, the study's findings underscore the importance of contextual factors in understanding beach recreationists' preferences. To enhance the generalizability of the findings, comparative studies should be conducted in different geographical contexts with varying levels of beach development and conservation efforts. This approach would enable researchers to investigate whether the observed preferences hold true in diverse settings and whether regional or cultural factors play a role in shaping beach recreationists' preferences.

5.3 Recommendations

Based on these findings, this study offers the following recommendations for practical applications. Public entities, such as the Kenya Wildlife Service and the County Government of Mombasa, should design targeted environmental awareness campaigns to promote ecocentric values and responsible beach behavior and foster a culture of conservation. Additionally, the importance of beach safety and congestion management should be addressed through increased patrol and enhanced safety measures. Effective congestion control can be achieved by improving access to less crowded beach areas and implementing designated areas.

Finally, this study provides valuable insights into visitor preferences, suggesting that beach areas should prioritize cleanliness, frequent patrols, and controlled congestion. By collaborating to create well-maintained, safe, and less congested environments, stakeholders can enhance visitor satisfaction, leading to increased repeat visits and benefiting the local tourism industry.

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