# Journal of Tourism & Hospitality

# Comparing Tourists' Travel Cost and Consumer Surplus to Estimate the Recreational Values of Kuakata Sea Beach in Bangladesh

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**ABSTRACT**

This research examines the recreational values of Kuakata Sea Beach in Bangladesh through the application of the Individual Travel Cost Method (ITCM). The tourism industry, a key driver of global economic growth, has experienced significant expansion in Bangladesh, driven by its coastal areas and cultural diversities. Despite its potential, the country encounters difficulties in sustainable tourism development. Recognizing the need to understand the economic and cultural worth of this natural treasure, we employ the TCM to evaluate both the economic importance and intangible elements of recreation. By conducting 211 on-site questionnaires and using a linear regression model, we analyzed socio-economic attributes, travel patterns, and factors impacting the frequency of visits. The regression analysis underscores the significant impact of income and gender on visitors' behaviour at Kuakata Sea Beach, indicating a positive correlation between increased income levels and a greater frequency of visits among males. Furthermore, the economic analysis shows a substantial individual consumer surplus of BDT 1775 and a total consumer surplus of BDT 20,41,25,000 for Kuakata Sea Beach. However, visitor feedback also highlights concerns that demand consideration, such as road management, accommodation quality, and facility inadequacies. This study not only contributes to environmental economics but also offers valuable insights for policymakers, conservationists, and local communities to oversee and improve the attractiveness of Kuakata Sea Beach, guaranteeing its preservation and advantages for the well-being of future generations effectively and sustainably.

**Keywords:** Recreational values; Kuakata sea beach; Tourism; Individual travel cost method

## INTRODUCTION

Tourism is a vital industry that contributes significantly to a country's economic growth, job creation, and global recognition. According to Oxford Economics and World Travel & Tourism Council (WTTC) reports, the travel and tourism sector supports over 307 million jobs worldwide and constitutes 10.4% of the global GDP [1]. In Bangladesh, tourism's direct contribution to the country's GDP was $5.3 billion in 2016, making up 2.2% of the total GDP. The industry is forecasted to continue growing, reaching $10.2 billion or 2.1% of total GDP by 2027. Developing countries like Bangladesh can benefit significantly from tourism due to its coastal areas, natural beauty, and cultural diversities. Bangladesh, with its approximately 170 million populations, boasts a significant youth demographic, with a median age of 26 years [2]. This youthful population presents promising opportunities for the country's tourism industry, indicating a positive trajectory for future developments [3]. Bangladesh's tourism sector has experienced rapid growth in the last two decades but has yet to achieve the same level of success as its neighboring countries. Bangladesh's tourism sector faces challenges in sustainable development due to inadequate infrastructure, unsatisfactory accommodation, and poor transportation links [4].

The success of the sector relies on marketing promotion tools like advertising, personal selling, sales promotion, and public relations. Key threats include construction, visitor trespassing, wildlife disruption, improper waste disposal, and noise pollution [5]. Bangladesh, a South Asian country with natural variations like hilly areas, sea beaches, mangrove forests, and historical sites, has significant potential for world tourism. Despite seasonal tourism, there is potential for year-round domestic tourism. Bangladesh boasts the world's longest unbroken sea beach, a 580 km coastline, a 200 nm exclusive economic zone, and 12 nm terrestrial zones [6]. With its vast coastal and marine resources, Bangladesh has the potential for substantial growth in coastal and marine tourism. The

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country's most significant sea beaches are Cox's Bazaar Sea Beach and Kuakata Sea Beach. Kuakata, also known as 'Sagor Konnya' (Daughter of the Sea), is located at the southernmost tip of Bangladesh in the Patuakhali district [7]. Situated 320 kilometers south of Dhaka and 70 kilometers from the Patuakhali district headquarters, Kuakata boasts a unique feature it is one of the few places in the world where both sunrise and sunset can be viewed from the same spot. This phenomenon is also found in Japan.

The 30 km long and 6 km wide sandy beach gently slopes into the Bay of Bengal and is a sanctuary for migratory winter birds [8-12]. It holds religious significance for both Hindu and Buddhist communities, with devotees gathering during festivals like 'Rush Purnima' and 'Maghi Purnima'. Kuakata features a 100-year-old Buddhist Temple housing one of South Asia's largest Gautama Buddha statues and two wells dating back 200 years [13-17]. The beach offers a serene natural setting characterized by forested shorelines, colourful sailboats, fishing activities, cliffs, and surfing waves in the Bay of Bengal. Kuakata is a virgin beach that exhibits diverse attractions throughout the day, making it a visual delight for visitors. Kuakata Sea Beach serves as an essential hub for recreational activities, becoming a cherished destination for travelers yearning for a retreat from the bustle of daily life. Understanding the true value of these natural treasures, both in economic and cultural terms, is of paramount importance. In this context, the Travel Cost Method (TCM) emerges as a powerful tool for unravelling the intricacies of recreational values. The travel cost method is a non-market valuation procedure that values recreational sites by analyzing consumption behavior in related markets. It assumes weak complementarity between the site and consumption expenditure, implying that the marginal utility of visitation is zero when consumption expenditure falls to zero [18-20]. The method has been widely accepted and considered a success story of non-market valuation techniques. In our study examining the costs that visitors incur to travel to Kuakata, along with their expenditure patterns and the inherent value they place on the experiences gained, this method offers a nuanced understanding of the economic significance of the beach. Additionally, it also allows us to explore the intangible aspects of recreation, like the emotional connections, the cultural significance, and the well-being benefits that visitors usually derive from their experiences when they visit Kuakata Sea Beach.

This research attempts to delve into the depths of Kuakata Sea Beach's recreational values by using the Travel Cost Method as a means to quantify and qualify the economic and social worth of this natural haven [21]. By doing this, we not only contribute to the academic discourse surrounding environmental economics but also provide valuable insights for policymakers, conservationists, and local communities alike [22]. Through this investigation, we aim to underscore the importance of preserving and cherishing Kuakata Sea Beach for the generations to come, ensuring that its beauty and benefits endure in the face of a rapidly changing globalized world. The Bangladesh government is recognizing the tourism industry as a potential economic growth driver, with the World Travel and Tourism Council predicting a 6.5% increase to BDT 935.5 billion by 2024 [23]. Bangladesh has the potential for ecotourism, highlighting the country's natural beauty, historical sites, beaches, tribal communities, resorts, forests, and diverse wildlife. The Bangladesh Parjatan Corporation (BPC) aims to grow the travel industry and provide administration to local and international travellers. Consequently, a precise valuation of these tourism services is very critical for the appropriate authority before

tailoring policies that accelerate the development process of the country [24].

The Travel Cost Method (TCM) is an economic valuation technique used to assess environmental services, such as natural beauty used as tourist attractions [25]. TCM uses consumer demand theory, which deduces a person's value to the environment from the costs incurred to the location visited. Consumer surplus is a central issue in TCM, and estimating it requires knowing the relationship between the number of visits and the amount of costs. The TCM is a consumer-oriented approach used to assess environmental amenities in recreational areas, nature reserves, and other natural areas. It assumes that tourists must visit a site if they can use the services provided by the site. The money spent by getting to the site represents the travel cost the tourist is willing to pay for being on the site and using the services. TCM is considered the oldest method for assessing environmental amenities, developed by Harold Hotelling in 1947. The model was extended by Clawson and Knetch, who used the price of substitutes and the quality of evaluated destinations. TCM includes the zonal model and the individual model developed a single-site model derived from these models.

Tourism expenditures are crucial for economic growth, impacting both destinations and travelers. Economic impact studies in travel and tourism aim to determine the effects of specific activities on the income, wealth, and employment of residents in a specific geographic area [26]. Key determinants of tourist spending levels include socio-economic factors like income, education, travel party size, and visit motivation. Additionally, travel-specific factors such as accommodation type, season, length of stay, and destination features significantly impact demand and expenditure patterns. Notably, first-time travelers tend to spend more than repeat visitors, reflecting distinct spending behaviors based on experience and travel history. Using the individual trip cost method, a study calculates the recreational value of Ghaleh Rudkhan Forest Park in northern Iran [27-30]. Factors such as travel expenses, income, distance, family size, and visitor's age were influential in evaluating recreational values. The Kilim Karst Geoforest Park is a vital conservation area containing limestone formations, mangrove forests, beaches, wetlands, and islands, and is under threat from development. The study assessed its economic benefits using the Travel Cost Method and consumer surplus adjustment techniques.

The TCM has been widely utilized in various studies across different countries to assess the economic value of outdoor recreational activities. It is a valuable valuation tool for estimating consumer surplus in recreational sites or environmental attributes, but it requires careful technical and data requirements. It uses to estimate the recreational value of Yulong Snow Mountain, China's most developed glacier tourist attraction, by analyzing first-hand information from field surveys and calculating the travel costs of visitors. Additionally, a travel cost analysis was conducted on Australian tourists to the Wet Tropics of Queensland World Heritage Area to determine consumer surplus value. The Contingent Valuation Method (CVM) estimates economic values for ecosystem and environmental services by directly asking people to state their willingness to pay for a specific service [31]. The TCM estimates economic use values for recreation sites by estimating people's willingness to pay based on the number of trips at different travel costs. However, in developing countries like India, the CVM may only sometimes provide accurate valuations due to the parallel economy. TCM is preferable for single-cultural experiences due

to simplicity and cost efficiency, while CVM is recommended for bundles. The TCM is a revealed preference method that focuses on the economic assessment of non-marketed resources like cultural heritage. It assumes that demand for a recreational site is inversely related to travel costs and can consider various parameters such as fuel, entrance fees, travel time, rent, and socio-economic variables.

Tourism is a dynamic and profitable sector for the global economy, particularly in developing countries like Bangladesh. The country offers numerous natural, cultural, historical, archaeological, religious, and man-made tourist destinations, allowing visitors to experience unique cultures, traditions, food habits, wildlife, and various activities. The tourism industry plays a significant role in Bangladesh's GDP growth by creating new employment opportunities, alleviating poverty, enhancing local community participation, earning foreign currency, improving economic standards, and making people economically and socially stable. However, there are several recommendations for the growth of the tourism industry in Bangladesh. These include infrastructure development, proper maintenance of communication systems, updating tourism policies, ensuring proper utilization of budgets, addressing security issues at the tourism ministry, involving local communities in tourism-related activities, creating public awareness, creating destination activities, planning promotional activities globally, incorporating both private and public sectors, encouraging participation from both male and female workers, providing accurate information, creating distinct foreign zones, and ensuring calm, enjoyable tourist spots [32].

Bangladesh's abundant water resources, including rivers, canals, lakes, ponds, and beaches, make it an ideal location for water-based tourism activities. The development of water tourism in Bangladesh could create a new form of tourism that benefits society, economy, environment, and culture. Factors influencing individuals' willingness to pay for environmentally sound tourism management include nominal amount bid, income, and education, while experience, travel costs, income, age, and perception influence visit frequency. Kuakata, a significant natural and tourist area, faces significant development deficiencies, including inadequate living standards, education, healthcare, and support for fishermen and farmers. The study highlights the need for comprehensive development plans, including improved transportation, power sectors, and beach facilities, to harness the area's potential sustainably [33].

## MATERIALS AND METHODS

The Kuakata Sea Beach, situated in the southwestern part of Bangladesh, presents a unique geographical location that makes it a compelling subject for economic analysis. Nestled between the Bay of Bengal and the vast expanse of the Kuakata Sea, this coastal enclave provides a rich tapestry for researchers exploring economic dynamics. Its coordinates are situated around 21.82° N latitude and 90.12° E longitude. The elevation, relatively low and harmoniously blending with the coastal landscape, adds to its significance as a potential economic hub.

Beyond its geographical features, the Kuakata Sea Beach holds substantial cultural and tourist importance, forming an integral part of the local identity. The fusion of cultural elements with the natural beauty of the beach creates a distinct attraction for both domestic and international tourists. Pilgrims and vacationers alike are drawn to the beach for its spiritual ambience, earning it the moniker "Daughter of the Sea." This cultural and spiritual

connection intertwines with the economic fabric of the region, impacting tourism patterns and expenditure behaviors.

Furthermore, the facilities available in and around the Kuakata Sea Beach play a vital role in shaping its economic landscape. From accommodation options to transportation infrastructure, the range and quality of facilities directly impact the influx of tourists and, consequently, the economic activities in the area. Analyzing the existing facilities and identifying areas for improvement becomes paramount for stakeholders looking to optimize economic benefits while preserving the natural and cultural essence of this coastal haven. In essence, the economic analysis of Kuakata Sea Beach requires a holistic examination, incorporating its geographical attributes, cultural significance, and the array of facilities contributing to its economic vibrancy.

In conducting a comprehensive economic analysis of Kuakata Sea Beach, the study utilized the TCM to evaluate the consumer surplus of visitors and determine the monetary value associated with recreational activities within the area. The TCM is a well-established methodology for estimating the economic value of non-market goods and services, specifically in the context of recreational spaces. By applying this method, the study aimed to provide a nuanced comprehension of the economic contributions linked to the recreational features of Sea Beach. This involved assessing visitor satisfaction and economic well-being, contributing to a more comprehensive understanding of the beach's role in the local economy.

To gather relevant data, 400 on-site questionnaires were conducted during weekdays, weekends, and holidays in May 2023. Among the 400 respondents, 189 participants were visiting the beach for the first time. Consequently, we used 211 questionnaires for the subsequent analysis. The survey scope was carefully designed to encompass a diverse range of visitor behaviors, spanning both regular weekdays and special days. The questionnaire delved into the socioeconomic characteristics of the visitors, exploring aspects such as gender, age, income, occupation, and education. Additionally, it included inquiries related to the travel costs associated with visiting the sea beach, facilitating a thorough exploration of the economic aspects related to accessing and enjoying the recreational facilities. This multi-dimensional approach in data collection aimed to present a holistic summary of the financial factors that surround Kuakata Sea Beach, with a specific emphasis on the consumer surplus and the economic value of recreation activities.

In this study, a linear regression model was employed to elucidate the economic trends of Kuakata Sea Beach. The regression equation is represented in equation 1.

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + \varepsilon \dots \dots (1)$$

Where y is the visit frequency at Kuakata Sea Beach. $\beta_0$ is the intercept term $\beta_1$ to $\beta_8$ are the coefficients associated with the respective independent variables, $x_1$ to $x_8$ (Gender, Age, Education, Occupation, Income, Alternative sites, Distance, Travel Cost). Gender, occupation and alternative sites are dummy variables while $\varepsilon$ is the error term.

This regression equation encapsulates the quantitative relationships between the visit frequency and diverse socio-economic factors, offering a comprehensive framework for comprehending and interpreting the influence of each variable on the behavior of

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visitors at Kuakata Sea Beach. In the context of analyzing the economic aspects of Kuakata Sea Beach through the individual Travel cost method, we utilize Consumer Surplus (CS) as a crucial measure. To estimate the Consumer Surplus for Kuakata Sea Beach, we employ the following formula presented in equation 2 [25].

$$CS = \frac{q}{-\beta_8} \ldots \ldots (2)$$

Where 'q' signifies the annual average number of visits made by visitors to the beach. The parameter '$\beta_8$' represents the cost coefficient in the demand function.

## RESULTS AND DISCUSSION

The economic analysis of Kuakata Sea Beach elucidates key socio-economic characteristics of its visitors, as outlined in Table 1. On average, individuals who visited Kuakata Sea Beach are roughly 39 years old, with an educational achievement of approximately 15 years. The average income of these visitors is around 47850 Bangladeshi Taka (BDT). The distance covered to reach the beach is approximately 385.67 kilometers. The average travel cost incurred by visitors is 686.49 BDT, whereas hotel expenditures average 881.51 BDT. These findings provide a comprehensive overview of the demographic and economic characteristics of Kuakata Beachgoers, establishing a foundation for further economic assessments and policy considerations in the sphere of tourism development and management.

**Table 1:** Socio-economic characteristics of the Kuakata Sea beach visitors.

| Variables | Average | Standard deviation | Maximum | Minimum |
|---|---|---|---|---|
| Age (Year) | 38.95 | 14.45 | 65 | 13 |
| Educational attainment | 14.95 | 2.73 | 17 | 5 |
| Income (Thousand in BDT) | 47.85 | 31.88 | 77 | 7 |
| Distance (KM) | 385.67 | 220.48 | 1256 | 120 |
| Number of visits | 3.55 | 2.22 | 1 | 7 |

Table 2 illustrates the gender distribution of visitors to Kuakata Sea Beach, offering insights into the demographic composition of the sample. Among the 211 respondents, 160 were male, making up 75.83% of the total, while 51 were female, representing 24.17%. This gender distribution highlights a significant predominance of male visitors to Kuakata Sea Beach (Table 2).

**Table 2:** Gender-based statistics of the respondents.

| Gender | Frequency | Relative Frequency (%) |
|---|---|---|
| Male | 160 | 75.83 |
| Female | 51 | 24.17 |
| Total | 211 | 100 |

Table 3 delineates the distribution of age groups of visitors to Kuakata Sea Beach, providing valuable insights into the demographic composition of the surveyed population. The data reveals that out of the 211 participants, 20 individuals (9.48%) were below 18 years old, 73 individuals (34.60%) fell within the 18-35 age range, 80 individuals (37.91%) were aged between 36 and 54, and 38 individuals (18.01%) were situated in the 55-72 age bracket (Table 3).

**Table 3:** Age distribution of the visitors.

| Age | Frequency | Relative frequency (%) |
|---|---|---|
| <18 | 20 | 9.48 |
| 18-35 | 73 | 34.6 |
| 36-54 | 80 | 37.91 |
| 55-72 | 38 | 18.01 |
| Total | 211 | 100 |

Table 4 provides information on the educational levels of Kuakata Sea Beach visitors, presenting a succinct overview of the surveyed population's educational background. Among the 211 respondents, 1 individual (0.47%) had 1-5 years of education, 23 individuals (10.90%) had 6-10 years, 39 individuals (18.48%) had 11-12 years, 54 individuals (25.59%) had 13-16 years, and 94 individuals (44.55%) had 16 or more years of schooling (Table 4).

**Table 4:** Level of education of the respondents.

| Years of schooling | Frequency | Relative frequency (%) |
|---|---|---|
| 01-05 | 1 | 0.47 |
| 06-10 | 23 | 10.9 |
| 11-12 | 39 | 18.48 |
| 13-16 | 54 | 25.59 |
| 16+ | 94 | 44.55 |
| Total | 211 | 100 |

Table 5 outlines the varied employment statuses of Kuakata Sea Beach visitors, providing a snapshot of the employment status within the surveyed group. Among the 211 respondents, 35 individuals (16.59%) classified themselves as students, 68 individuals (32.23%) were employed, 15 individuals (7.11%) were self-employed, 45 individuals (21.33%) were homemakers, 1 individual (0.47%) was unemployed, and 47 individuals (22.27%) were retired (Table 5).

**Table 5:** Employment status of the visitors.

| Jobs | Frequency | Relative frequency (%) |
|---|---|---|
| Student | 35 | 16.59 |
| Employed | 68 | 32.23 |
| Self employed | 15 | 7.11 |
| Home maker | 45 | 21.33 |
| Unemployed | 1 | 0.47 |
| Retired | 47 | 22.27 |
| Total | 211 | 100 |

In terms of income presented in Table 6, among the 211 respondents presented in Table 6, 44 individuals (20.85%) reported an income of BDT 10,000 or less, 7 individuals (3.32%) had incomes between BDT 11,000 and BDT 20,000, 27 individuals (12.80%) fell within the BDT 21,000 to BDT 30,000 range, 32 individuals (15.17%) had incomes between BDT 31,000 and BDT 40,000, 20 individuals (9.48%) reported incomes between BDT 41,000 and BDT 50,000, and 81 individuals (38.39%) had incomes exceeding BDT 60,000 (Table 6).

**Table 6:** Levels of income of the respondents.

| Income (Thousand in BDT) | Frequency | Relative frequency (%) |
|---|---|---|
| <=10 | 44 | 20.85 |
| 11-20 | 7 | 3.32 |
| 21-30 | 27 | 12.8 |
| 31-40 | 32 | 15.17 |

| | | |
|---|---|---|
| 41-50 | 20 | 9.48 |
| 51-60 | 0 | 0 |
| 60+ | 81 | 38.39 |
| Total | 211 | 100 |

Table 7 outlines the distribution of travel costs for visitors to Kuakata Sea Beach, revealing distinct expenditure patterns. Among the 211 respondents, 69 individuals (32.70%) incurred travel costs ranging from BDT 0 to BDT 500, while 141 individuals (66.82%) spent between BDT 501 and BDT 1000. Only one respondent (0.47%) reported travel costs falling within the range of BDT 1001 to BDT 1500 (Table 7).

**Table 7:** Distribution of travel costs (In Bangladeshi Taka).

| Travel costs (BDT) | Frequency | Relative frequency (%) |
|---|---|---|
| 0-500 | 69 | 32.7 |
| 501-1000 | 141 | 66.82 |
| 1001-1500 | 1 | 0.47 |
| Total | 211 | 100 |

Table 8 displays the travel distances of visitors to Kuakata Sea Beach, indicating that the majority, 145 individuals (68.72%), covered distances ranging from 0 to 500 kilometers. Additionally, 63 individuals (29.86%) traveled distances between 501 and 1000 kilometers, while only 3 individuals (1.42%) ventured beyond 1000 kilometers (Table 8).

**Table 8:** Distribution of distance travelled by the visitors.

| Distance (KM) | Frequency | Relative frequency (%) |
|---|---|---|
| 0-500 | 145 | 68.72 |
| 501-1000 | 63 | 29.86 |
| 1001-1500 | 3 | 1.42 |
| Total | 211 | 100 |

Table 9 outlines the visitation frequency at Kuakata Sea Beach, revealing that out of the 211 respondents, 48.34% participants visited 1-2 times, 13.74% visited 3-4 times, and 37.91% visited the beach four or more times (Table 9).

**Table 9:** Frequency of visits among the respondents.

| Number of visits | Frequency | Relative frequency (%) |
|---|---|---|
| 01-02 | 102 | 48.34 |
| 03-04 | 29 | 13.74 |
| 4+ | 80 | 37.91 |
| Total | 211 | 100 |

Table 10 outlines the frequency of visitors to Kuakata Sea Beach who have also visited another sea beach. 58.29% of the respondents answered affirmatively, indicating that a substantial majority have experienced other seaside destinations, while 41.71% reported not having visited another sea beach (Table 10).

**Table 10:** Whether the respondents have also visitedanother seabeach.

| | Frequency | Relative frequency (%) |
|---|---|---|
| Yes | 123 | 58.29 |
| No | 88 | 41.71 |
| Total | 211 | 100 |

Table 11 provides insights into the length of visitors' stays at Kuakata Sea Beach, indicating that out of the 211 respondents, 23 individuals (10.90%) spent less than a day, 179 individuals (84.83%) stayed for 1-2 days, and 9 individuals (4.27%) opted for 3-5 days. This finding underscores a predominant pattern of short-term stays, with the majority of visitors favoring a 1-2 days, beach experience (Table 11).

**Table 11:** Number of days spent on Kuakata Sea Beach.

| Days | Frequency | Relative frequency (%) |
|---|---|---|
| <1 | 23 | 10.9 |
| 01-02 | 179 | 84.83 |
| 03-05 | 9 | 4.27 |
| Total | 211 | 100 |

Table 12 outlines the main reasons of visitors to Kuakata Sea Beach, revealing that the majority, 83.41% visited for leisure vacations, while 11.37% were there for family gatherings, and 3.32% for business purposes. Only 1.90% visited for other motivations (Table 12).

**Table 12:** Statistics on the diverse purposes of the visit.

| Purpose | Frequency | Relative frequency (%) |
|---|---|---|
| Leisure vacation | 176 | 83.41 |
| Family gathering | 24 | 11.37 |
| Business | 7 | 3.32 |
| Others | 4 | 1.9 |
| Total | 211 | 100 |

Table 13 outlines the accommodation preferences of visitors at Kuakata Sea Beach, with 93.84% opting for hotels or resorts, 0.95% choosing guesthouses or homestays, and 5.21% selecting other accommodation options. The overwhelming preference for hotels or resorts indicates a strong inclination towards well-established lodging facilities among the respondents surveyed (Table 13).

**Table 13:** Types of accommodation used by the visitors.

| Type | Frequency | Relative frequency |
|---|---|---|
| Hotel/resort | 198 | 93.84 |
| Guesthouse/homestay | 2 | 0.95 |
| Others | 11 | 5.21 |
| Total | 211 | 100 |

Table 14 outlines the per-day spending patterns of Kuakata Sea Beach visitors. A significant portion, comprising 48.82% of the respondents, spend less than BDT 1000, while 39.34% fall within BDT 1000-2000, suggesting a prevalent trend of relatively moderate expenditures among the surveyed visitors (Table 14).

**Table 14:** Amount spent per day by the visitors.

| Expenditure | Frequency | Relative frequency |
|---|---|---|
| <1000 | 103 | 48.82 |
| 1000-2000 | 83 | 39.34 |
| 2001-3000 | 17 | 8.06 |
| 3001-4000 | 4 | 1.9 |
| 4001-5000 | 1 | 0.47 |
| >5000 | 3 | 1.42 |
| Total | 211 | 100 |

The linear regression analysis presented in Table 15 provides valuable insights into the factors influencing visitors' behavior at Kuakata Sea Beach. Notably, the income coefficient is statistically

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significant at the 1% level, implying that as income increases, visitors tend to have a positive association with their experiences at the beach. Gender also influences the frequency of visits, with a significant positive coefficient of 0.31 ($p<0.05$) signifying that males exhibit a higher frequency of visits compared to females. Age has a significant but relatively smaller effect on the number of visits. Notably, having visited another beach shows a significant negative impact on the visit frequency, as reflected by the substantial coefficient of -1.61 ($p<0.01$), suggesting that those who have visited other beaches may have different preferences or expectations at Kuakata Sea Beach. Conversely, education and distance both have a positive impact on the frequency of visit, but it is statistically insignificant.

**Table 15:** Results of linear regression model.

| Variables | Coefficients | Variables | Coefficients |
|---|---|---|---|
| Constant | 3.68*** | Income | 0.01*** |
| | (0.6416) | | (0.0045) |
| Gender | 0.31** | Alternative sites | -1.61*** |
| | (0.1436) | | (0.2808) |
| Age | 0.01* | Distance | -0.0003 |
| | (0.0064) | | (0.0002) |
| Education | 0.02 | Travel cost | -0.002*** |
| | (0.0311) | | (0.0003) |
| Occupation | - | Number of observations | 211 |
| Self-employed | 0.09 | F-value | 120.68 |
| | (0.2308) | | - |
| Unemployed | -0.2 | Prob. (F statistics) | 0.00 |
| | (0.8133) | | - |
| Student | 0.2 | R-squared | 0.88 |
| | 0.2 | | - |
| Retired | 1.00*** | Adjusted R-squared | 0.87 |
| | (0.2709) | | - |
| Homemaker | 0.79*** | - | - |
| | (0.2298) | - | - |

**Notes:** *** indicates 1% level of significance; ** indicates 5% level of significance and * indicates 10% level of significance and the magnitude in the parentheses is the standard error.

Moreover, examining the occupation-related coefficients, it is observed that individuals classified as "Retired" display a statistically significant positive correlation with the number of visits, indicating a distinct beach experience for retirees. Additionally, "Homemaker" status is also significantly positive, indicating that individuals in this category tend to contribute positively to their experiences at Kuakata Sea Beach. But the effects of occupation such as self-employed, unemployed and student are statistically insignificant. The overall model performance is robust, evident in the high R-squared value of 0.88, indicating that the included variables collectively explain a substantial proportion of the variation in visitors' behavior at the beach.

In the economic analysis of Kuakata Sea Beach using the travel cost method, the individual Consumer Surplus (CS) was derived by substituting the annual average number of visits (q=3.55) and

the cost coefficient ($\beta_8$=-0.002) into equation 2. The resulting equation, CS=q/(-$\beta_8$) =3.55/(-(-0.002)) =BDT 1775, represents the monetary value of individual consumer surplus. On average, a total of 115,000 visitors visited this place per year [26]. Considering this annual visitation, the Total Consumer Surplus (TCS) for Kuakata Sea Beach was computed as TCS=CS* Total Visitors=1775* 115,000=BDT 20,41,25,000. This significant value provides insight into the overall economic benefit accruing to visitors and the local economy from the presence of tourists at Kuakata Sea Beach (Table 15).

## CONCLUSION

This study, utilizing the individual travel cost method and incorporating visitor perspectives, paints a detailed portrait of the beach's socio-economic landscape. The detailed breakdown of visitors' demographics, coupled with regression analysis insights, provides a nuanced understanding of the factors influencing their behavior. The significant values of both individual and total consumer surplus underscore the economic significance of tourism for both individuals and the local economy. However, visitor feedback highlights notable concerns, including road management issues, shortage of quality hotels, high prices for low-quality food; a lack of essential facilities such as portable dustbins, washroom and changing facilities and instances of harassment by photographers and vendors. Addressing these challenges is paramount for fostering sustainable tourism and improving overall visitor satisfaction at Kuakata Sea Beach. The synthesis of economic data and visitor opinion offers a comprehensive foundation for informed policy decisions aimed at enhancing the beach's appeal and ensuring a positive and memorable experience for all visitors.

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