EVALUATING URBAN GREENSPACE SATISFACTION AND BMI OUTCOMES IN DHAKA'S DHANMONDI LAKE PARK: A STEP TOWARD ACHIEVING SDG 11.7

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ABSTRACT

Greenspaces within the built environment are paramount for people's health and a decent experience in city environments. This research assesses visitor satisfaction and health status in Dhanmondi Lake Park, Dhaka, Bangladesh, following the visionary goal of SDG 11.7 on safe, accessible, and inclusive public spaces. The study hypothesizes a link between frequent park visits and a healthier Body Mass Index (BMI). A mixed-methods approach included a survey of 400 park visitors to assess their satisfaction across seven key dimensions: location, accessibility, environment, facilities, recreation, safety, and maintenance, comprising 29 sub-variables. Participants' height and weight data were measured to calculate Body Mass Index (BMI), and Pearson's correlation coefficient was used to investigate the potential relationship between visit frequency and BMI. Additionally, five Focus Group Discussions (FGDs) and two Key Informant Interviews (KIIs) were conducted with the park management, followed by a SWOT analysis to evaluate the park's strengths, weaknesses, opportunities, and threats. This research established high levels of satisfaction with recreation (4.3), showing that the park meets recreational and aesthetic needs. Participants pointed to maintenance (3.78) and safety (3.9) as areas of concern. Frequent visits showed a strong positive relationship with healthy BMI ($r = 0.934$, $p = 0.006$), suggesting the health benefits of regular engagement. Dhanmondi Lake Park provides the community with an opportunity to engage in physical, recreational, and social activities, contributing to the achievement of SDG 11.7. Findings indicate that well-maintained urban

greenspaces not only enhance visitor satisfaction but also contribute to healthier BMI, offering effective measures for urban planners and policymakers to promote public health and achieve SDG 11.7 in rapidly growing cities.

Keywords: Urban greenspaces, visitor satisfaction, body mass index, sustainable development goal.

INTRODUCTION

Urban green areas significantly improve city living quality through their provision of recreation chances alongside physical exercise spaces and social bonding possibilities. (Edeigba et al., 2024). These spaces are essential foundations that maintain physical and mental well-being, as well as environmental sustainability, with social equity. (Zhang & Qian, 2024). The target specified in SDG 11.7 seeks the creation of safe, accessible, and inclusive greenspaces for achieving sustainable population well-being through urban development plans. (Hsu et al., 2022).

The investigation of Dhanmondi Lake Park serves as an important research study because it focuses on one of Dhaka's most significant urban greenspaces in Bangladesh (Uddin et al., 2023). The high rates of park visitors at Dhanmondi Lake Park create a perfect environment to study visitor satisfaction elements and health outcomes from park interactions. The need to examine how parks like Dhanmondi Lake support well-being has gained increased importance because of growing urbanization concerns and public greenspace shortages in Dhaka. The present study addresses essential knowledge deficiencies about how urban greenspaces in Bangladesh fulfill the global sustainability target SDG 11.7 and benefit physical and mental well-being.

Urban greenspaces positively impact visitor satisfaction, environmental sustainability, and public health. (Rai et al., 2022). Visitor satisfaction grows directly with safety, recreational facilities, and facility maintenance elements of greenspaces (M. I. Hossain et al., 2017). Repeated interaction with natural settings allows people to minimize their stress levels, benefits their personal health, and helps reduce urban pollution rates. (Gidlow et al., 2016). However, there remains a significant gap in research on how these factors specifically relate to the population of Dhaka, Bangladesh, and how visitors' visit frequency correlates with health outcomes such as BMI levels. While studies on urban greenspaces in developed countries are abundant, the application of these findings to rapidly urbanizing cities in the Global South, particularly Bangladesh, remains underexplored.

This research aims to investigate how urban greenspace contributes to Sustainable Development Goal 11.7 by analyzing visitor satisfaction and BMI measures among users of Dhanmondi Lake Park in Dhaka, exploring the relationships between user perceptions, engagement patterns, and health outcomes to better understand how accessible, inclusive, and safe public spaces promote urban well-being. The objectives of this research are: (1) to assess urban greenspace satisfaction across key dimensions: location, accessibility and inclusivity, environment, facilities, recreational settings, safety and security, and maintenance, (2) to examine the relationship between the frequency of park visits and visitors' BMI, (3) to evaluate how urban greenspace contributes to SDG 11.7 through greenspace satisfaction and BMI measures.

LITERATURE REVIEW

Parks, gardens, urban greenery, and natural corridors are central pillars of sustainable, healthy, and equitable cities. They provide the much-needed ecosystem functions, including purification of the air, temperature stabilization, and provision of biodiversity, as well as supporting social interactions and contributing to physical and mental well-being (Edeigba et al., 2024). This is particularly pressing in dynamically urbanizing cities, such as Dhaka, where the green cover is shrinking since more built-up spaces occupy the city (Shammi et al., 2023). SDG 11.7, entitled universal access to safe, inclusive and accessible green and public spaces, aims to have universal access to green and other public spaces under safer, inclusive, and accessible conditions, specifically to women, children, older persons and persons with disabilities by the year 2030 (Hsu et al., 2022). The consideration of an especially pertinent goal in the Global South is increased levels of urbanization and the great demand for high-quality, equitable public spaces (Hyder & Haque, 2022). A reduction in green cover is sharp in Bangladesh and more so in Dhaka, which is why SDG 11.7 shows a poor impact on urban sustainability and the health status of the population (Shammi et al., 2023).

The body of strong evidence proves that when urban greenspaces are accessible, it is linked to better physical health conditions, including obesity, cardiovascular disease, and mortality from other causes (Pimentel Da Silva et al., 2022). Greenspaces promote physical activity, decrease sedentary lifestyle behavior, and offer youth environments with physical exercise and active travel (Han, 2021). According to the results of systematic reviews, the availability and proximity of parks and recreational facilities have been linked strongly to the low body mass index and the increased physical activity of children and adults (Lachowycz & Jones, 2011).

In addition to physical health, the greenspaces have some associations with psychological well-being, reduced stress, and social cohesion (Zhu et al., 2021). Initial contact with nature restores mood, attention, and cognitive process, as well as alleviates signs of anxiety and depressiveness, which is especially relevant in high-density urban living (Olcoń et al., 2023). Greenspaces are also places of being together and holding community events, which is why resilience and vulnerable populations, including the elderly and children, can be supported with the help of greenspaces (Whyte, 2001). Parks are employed in informal social gatherings and religious and cultural festivals, but also as spaces of recreation in South Asian cities (M. I. Hossain et al., 2017).

Research on visitor satisfaction in urban greenspaces is multidimensional, and the relationship between the factors of environmental psychology, satisfaction theory, and urban planning affects visitor satisfaction in urban greenspaces (Lee et al., 2015). Expectations, quality, and alignment of user requirements and park characteristics determine satisfaction (Rai et al., 2022). Among the central factors determining the state of parks, one can distinguish location and its accessibility, quality of the environment and its maintenance, available facilities and recreation opportunities, the level of safety and security, and inclusivity (Hsu et al., 2022). The satisfaction is usually evaluated by systematic surveys with the help of Likert scales, and observational audit, and participatory methods (e.g., focus groups, interviews) help to collect some qualitative information on the topic (Man Rai et al., 2022).

Regardless of the evidence provided worldwide, a very limited number of studies have been conducted to analyze how greenspaces are used by people and their impacts on health in the Global South and more specifically in Bangladesh (Uddin et al., 2023). Dhaka, being one of the fastest-growing megacities of the world, has witnessed a drastic loss in green cover, with a mere 24.5 percent open space area in 2005 compared to the 44.8 percent in 1975 (Shammi et al., 2023). The unplanned growth and development, rapid urbanization, and population increase have resulted in the fragmentation and degradation of greenspaces (M. I. Hossain et al., 2017). A study conducted in Dhaka suggests that parks such as Dhanmondi Lake are crucial to physical activities, socialization, and mental health, yet their maintenance, in particular, can be an issue (Parvin et al., 2019). The study gaps that are highly pronounced include the absence of extensive studies examining the associations between the frequency of visiting and health effects in urban greenspaces.

The methodological demand is convergent, mixed-methods, and the principle of quantitative surveys, objective health variables, and qualitative understandings (Zhang & Qian, 2024). Longitudinal and experimental studies are required to elucidate causal routes and the dose-response of greenspace exposure (Song et al., 2023). With such missing links, the study assesses the satisfaction ratings and health parameters (BMI) of visitors within Dhanmondi Lake Park in Dhaka and directly refers to SDG 11.7. The study becomes valuable since it combined measures of satisfaction, visit frequency, and health in a fast-urbanizing experience, enhancing the existing evidence to support policy on urban management, including greenspaces in Bangladesh and other cities like it.

METHODOLOGY

Study Area

Dhanmondi Lake, located at approximately 23.7455°N latitude and 90.3776°E longitude in the heart of Dhaka, Bangladesh, lies within the Dhanmondi residential area under the jurisdiction of Dhaka South City Corporation (DSCC) (Fatemi, 2014), as shown in Figure 1. Redeveloped in the 1950s from an old river channel into an artificial lake, it now extends roughly 3 kilometers in length and serves as a vital greenspace in one of the most densely populated and urbanized parts of the city. (Dewan et al., 2012). According to records from RAJUK and the Dhaka Metropolitan Development Plan (DMDP), the lake covers a total area of about 37.37 hectares (92.37 acres), including approximately 23.53 hectares (58.15 acres) of waterbody and 13.84 hectares (34.22 acres) of adjacent land comprising parks, walkways, vegetation, and supporting infrastructure. (Parvin et al., 2019). The lake is strategically positioned, providing easy access to residents and visitors, with surrounding roads, public transportation, and key landmarks in close proximity. (Rahman et al., 2020).

Figure 1.

Showing Dhanmondi Lake and its surrounding park area in the Dhanmondi area, situated within the 49th ward of the Dhaka South City Corporation
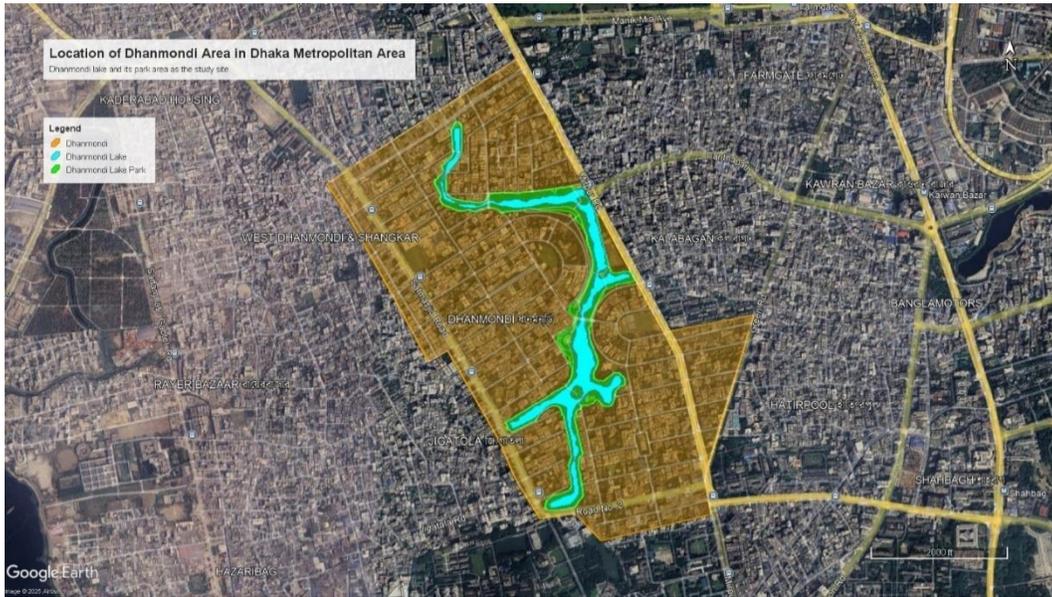
Source. Authors (2024).

Dhanmondi Lake attracts an estimated 3.65 million visitors annually, reflecting its popularity as a centrally located recreational space within Dhaka, frequented daily by thousands of residents and tourists. (Us, 2013). Multiple facilities exist at this location, including seating sections, cafes, and recreational facilities. The high number of visitors at Dhanmondi Lake creates an ideal environment to evaluate how park users feel about their park experience, along with their resulting health benefits. Figure 2 provides a detailed overview of the study area and its location.

Figure 2.

Overview Of Dhanmondi Lake and the Adjacent Park
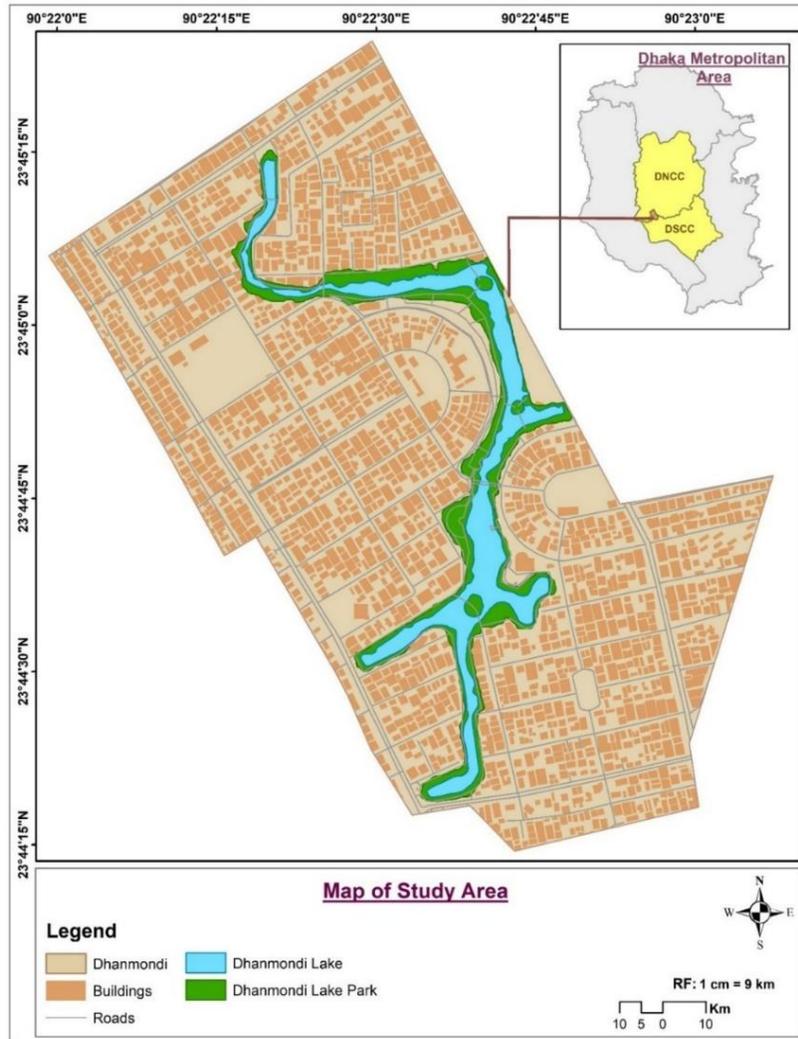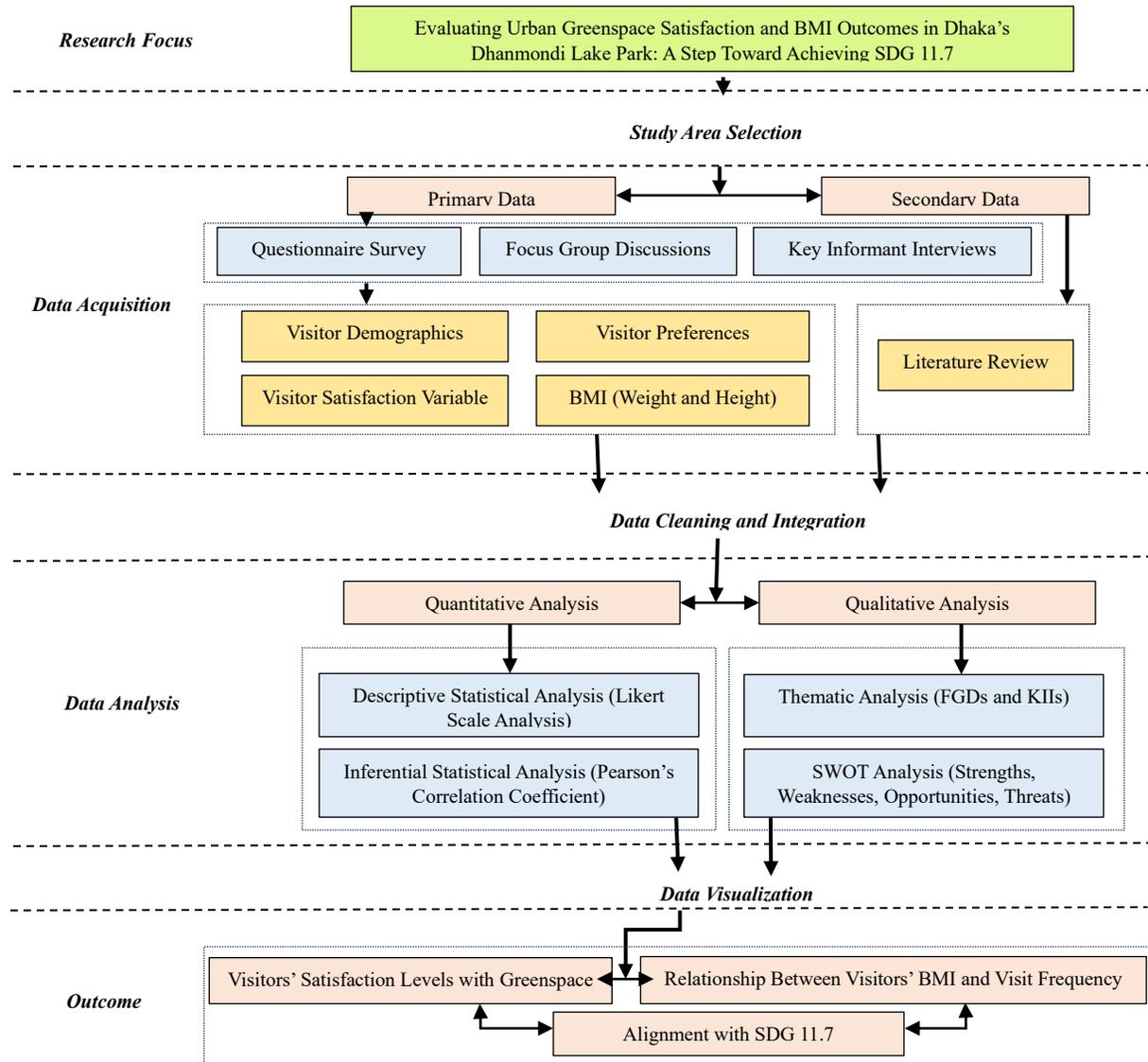

Source. Authors (2024).

Data Acquisition

The research design incorporated mixed methods, as illustrated in Figure 3, combining quantitative and qualitative data measurements collected throughout two months, from March to April 2024.

Figure 3

Methodological Framework Illustrating the Step-By-Step Processes from Data Acquisition to Analysis, Ultimately Showing the Outcomes of This Study.

Source. Authors (2024).

Sample size calculation was used to determine the appropriate number of respondents needed for reliable data analysis. For this study, I conducted a sample size calculation based on the estimated population of Dhanmondi Lake Park visitors. The population of Dhanmondi Lake Park is approximately 10,000 (The Business Standard, 2021). To calculate the sample size with a 5% margin of error and 95% confidence level (*Cochran*, 1977) –

$$\text{Infinite population, } n_0 = \frac{Z^2 * p * (1-p)}{E^2} \qquad (1)$$

Where:

- Z = Z-value corresponding to the confidence level (1.96 for 95%)
- p = Estimated proportion of the population (0.5)
- E = Desired level of precision or margin of error (0.05)

$$\text{Finite population, } n = \frac{n_0}{1+(\frac{n_0-1}{N})} \qquad (2)$$

Where:

- n_0 = 384, calculated infinite population
- N = 10,000, actual population size

The final sample size for the study was 370. A structured questionnaire survey was conducted among 400 park visitors to identify their demographics, preferences, and perceptions of urban greenspace. This ensures that the collected data is representative and valid for drawing meaningful conclusions about visitor satisfaction. The survey aimed to assess satisfaction levels across seven major variables: location, accessibility and inclusivity, environment, facilities, recreational settings, safety and security, and maintenance, and these seven major variables contained twenty-nine sub-variables (M. I. Hossain et al., 2017). These seven major variables were rated on a five-point Likert scale (1 = Very Dissatisfied to 5 = Very Satisfied), as shown in Table 1 (M. I. Hossain et al., 2017). To gain deeper insights, five focus group discussions (FGDs) with regular visitors, fitness enthusiasts, elderly users, and casual visitors, along with two key informant interviews (KIIs) with park management authorities, were conducted to understand the maintenance strategies and challenges of the park.

Table 1

A Five-Point Likert Scale Showing Intervals for Each Category, With 'Satisfaction' As the Response Variable

Response	Likert Scale	Likert Scale Interval	Likert Scale Description
	1	1.00 - 1.79	Very dissatisfied
	2	1.80 - 2.59	Dissatisfied
Satisfaction	3	2.60 - 3.39	Neutral
	4	3.40 - 4.19	Satisfied
	5	4.20 - 5.00	Very Satisfied

In addition to the questionnaire survey, data on height (cm) and weight (kg) were collected using a portable stadiometer and a digital weighing scale to evaluate health outcomes. (Haroun & Ehsanallah, 2024). These measurements were used to calculate Body Mass Index (BMI), categorized according to the WHO's BMI classifications, as shown in Table 2 (Weir & Jan, 2025).

Table 2

Categories Of Weight Based on Different BMI Ranges, According to the World Health Organization's (WHO) BMI Classification

BMI (Body Mass Index)	Weight Category
< 18.5	Underweight
18.5 - 24.9	Normal Weight
25 - 29.9	Overweight
30 - 39.9	Obese - Class I & II
≥ 40	Obese - Class III

Data collection was done systematically at different entry points, pathways, sitting areas, and recreational spots to capture diverse visitor experiences.

DATA ANALYSIS

Data analysis was carried out through descriptive statistics, including Likert scale analysis, to compute mean satisfaction scores for seven key variables. This approach aimed to understand variations in visitor satisfaction, utilizing Microsoft Excel and IBM SPSS Statistics 25. An inferential statistical analysis, Pearson´s Correlation Coefficient, was performed to test the association between visitors' visit frequency and BMI.

$$\text{Pearson´s Correlation Coefficient, } r = \frac{\sum(X_i-\bar{X})(Y_i-\bar{Y})}{\sqrt{\sum(X_i-\bar{X})^2\sum(Y_i-\bar{Y})^2}} \qquad (3)$$

Where:
- r is the Pearson correlation coefficient
- X_i and Y_i are the individual sample points for variables X and Y, respectively
- $\bar{X}$ is the mean of X
- $\bar{Y}$ is the mean of Y
- $\sum$ represents the summation over all data points

This formula calculates the covariance of the two variables, normalized by their standard deviations, producing a value between -1 and 1 (Turney, 2022) -
- $r = 1$ indicates a perfect positive linear relationship
- $r = -1$ indicates a perfect negative linear relationship
- $r = 0$ indicates no linear relationship

BMI (Body Mass Index) measures body fat based on a person's height and weight. It assesses whether a person is underweight, of normal weight, overweight, or obese. The formula for BMI is (Undiyaundeye et al., 2021) :

$$\text{BMI} = \frac{Weight_{kg}}{(Height)^2{}_m} \qquad (4)$$

Where:
- Weight is in kilograms (kg)
- Height is in meters (m)

Additionally, a strengths, weaknesses, opportunities, and threats (SWOT) analysis was conducted to assess the park's management efficiency, environmental quality, and policy challenges. This analysis served as the foundation for developing recommendations aimed at enhancing the user experience and promoting the sustainability of greenspace management.

RESULTS

Visitor Demographics

Table 3

Demographic profile of visitors in Dhanmondi Lake

Visitors' Demographics		Percentage (%)
Gender	Male	52.75
	Female	47.25
Age	Below 18	12.25
	18-25	34
	26-35	30.75
	36-45	14.5
	46-55	8.25
	56-65	6.75
	Above 65	5.75
Occupation	Government Employees	12.5
	Private Sector Employees	27.5
	Homemakers and Retirees	10.25
	Students	35.25
	Unemployed	6.25
	Others	8.25
Regions from which Visitors are coming	Distance from 0 to 1km	34.75
	Distance from 2 to 4km	27.25
	Distance from 5 to 10km	19
	Inside the Dhaka Metropolitan area	13.5
	Outside the Dhaka Metropolitan area	5.5

Demographic analysis of visitors to Dhanmondi Lake Park, shows a balanced gender distribution, with 52.75% female and 47.25% male (Table 3). The park is most popular among young adults, with the majority in the 18-25 age group. In terms of occupation, students made up the largest group. Regionally, most visitors came from the center of Dhanmondi. These findings highlight the park's appeal across diverse demographics.

Visitor Preferences and Usage Patterns

Table 4

Preferences Pattern of Visitors in Dhanmondi Lake

|	**Visitors' Preferences**	**Percentage (%)**
Frequency of Visits	Daily	15.25
	2 to 3 times a week	22.75
	Once a week	26.5
	2 to 3 times a month	18.25
	Once a month	11.5
	Less than once a month	5.75
Preferrable Time for coming	6:00 AM - 9:00 AM	18.75
	9:00 AM - 12:00 PM	12.75
	12:00 PM - 3:00 PM	8.75
	3:00 PM - 6:00 PM	27.5
	6:00 PM - 9:00 PM	32.25
Modes of Transport	Walking	30.5
	Motorized Private Vehicle	9.75
	Public Transport	27.75
	Ride-Sharing Services	6.5
	Rickshaw	22.25
	Bicycle	3.25
Duration of Visitors' Stay	≤30 Minutes	15.5
	30 Minutes - 1 Hour	36.25
	1 Hour - 2 Hour	40.5
	≥2 Hour	7.75
Purposes of Visits	Physical exercise	25.25
	Social engagement	40.25
	Relaxation	13.5
	Recreational activities	11.5
	Food Exploration	9.5

Most of the participants visit once a week. Preferred visiting times predominantly range between 6:00 pm and 9:00 pm (Table 4). Walking and public transport are the dominant modes of transport, while bicycles are the least utilized. The duration of stay is mostly 1–2 hours. Social engagement is the most common

reason for visits, followed by physical exercise, whereas food exploration and recreational activities are less common.

Visitor Satisfaction Across Various Dimensions

Figure 4.

Seven Major Variables and Twenty-Nine Sub-Variables to Assess Visitors' Satisfaction Levels with Urban Greenspaces
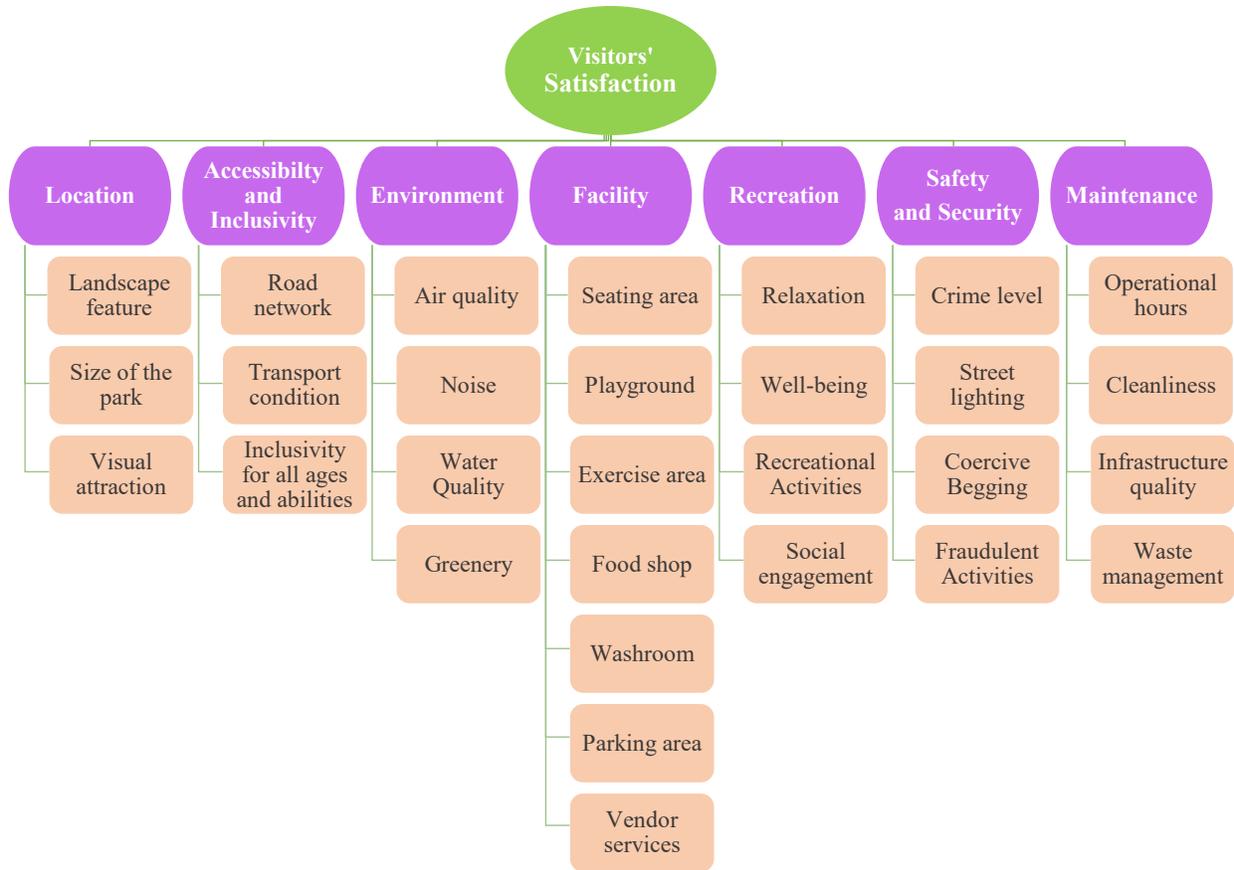
Source. Authors (2024).

The satisfaction of visitors with urban greenspaces was evaluated based on seven major variables: Location, Accessibility and Inclusivity, Environment, Facility, Recreation, Safety and Security, and Maintenance. These were further divided into twenty-nine sub-variables, which contributed to a systematic evaluation of visitor perceptions about the park, including facility infrastructure and environmental conditions, social activities, and safety aspects, as depicted in Figure 4. Park features such as landscape aspects, size, and visual appeal are measured in the location variable to analyze their impact on visitor satisfaction. The analysis included accessibility and inclusivity aspects regarding the road network regulations and transport conditions, as well as admission policies for people of all ages and ability levels, which represented an easy park entrance. A satisfactory park experience requires air quality, noise levels, and water quality, along with sufficient green areas, making up the Environment variable. The Facility addressed the quality and

availability of amenities like seating, playgrounds, washrooms, and vendor services, while the Recreation explored how the park promotes relaxation, well-being, social engagement, and the variety of recreational activities offered. The assessment of Safety and Security included crime levels, street lighting, coercive begging, and fraudulent activities to maintain park safety. The Maintenance category focused on evaluating operational hours, cleanliness, infrastructure quality, and waste management practices for assessing park conditions.

Visitor Satisfaction Levels Across Key Dimensions

The visitors who rated their experience as Very Dissatisfied demonstrated extensive dissatisfaction through negative emotional reactions. Multiple features of the park failed to meet the expectations of Dissatisfied respondents, so their experience fell short of satisfaction. Visitors reported that the park existed within Neutral boundaries since it delivered sufficient service but failed to provide unique value. Those who were satisfied reported a generally positive experience, with the park meeting most expectations and successfully balancing environmental and social needs. The Very Satisfied category indicated that visitors were thoroughly pleased, with the park exceeding expectations and providing a high-quality urban greenspace experience.

Table 5.

Level Of Visitor Satisfaction in Key Areas at Dhanmondi Lake

Visitors' Satisfaction Analysis				
Variable	**Mean Satisfaction**	**Level of Satisfaction**	**Overall Mean Satisfaction**	**Overall Level of Satisfaction**
Recreation	4.3	Very Satisfied		
Location	4.2	Very Satisfied		
Accessibility and Inclusivity	4.17	Satisfied		
Facility	4.13	Satisfied	**4.07**	**Satisfied**
Environment	4.02	Satisfied		
Safety and Security	3.9	Satisfied		
Maintenance	3.78	Satisfied		

Before analyzing the satisfaction data, the reliability of the visitor satisfaction scale was confirmed with a Cronbach's alpha of 0.911, demonstrating excellent internal consistency. The analysis, shown in Table 5, provided mean scores for each variable, offering a clear metric to assess how well the park's features met visitor expectations. Recreation variable had the highest mean satisfaction score of 4.3, indicating that visitors were mostly Very Satisfied with the park's recreational offerings. Responses highlighted a strong appreciation for facilities promoting relaxation, well-being, and social interaction, reflecting the park's success in fulfilling leisure and social needs. The Location variable revealed a mean satisfaction rating of 4.2 because visitors were very satisfied. Findings indicate that visitors consistently experienced favorable

experiences at the park because of its attractive location features, leading to low diversity among satisfaction levels.

A mean score of 4.17 for Accessibility and Inclusivity indicates that visitors were generally satisfied with park access and inclusivity for various age groups and abilities. Responses suggested a strong appreciation for visitors with disabilities. The Facility variable, with a mean score of 4.13, shows that visitors were generally satisfied with the park's amenities, including seating, playgrounds, washrooms, and food vendors. While the overall comfort and convenience are adequate, some feedback indicates minor dissatisfaction with washroom availability and parking. Findings reveal that visitors felt satisfied with their environmental experiences because the Environment variable measured 4.02 points. Visitors expressed positive comments about the quality of air, the presence of greenery throughout the site, and the management of environmental conditions. The survey revealed minor issues with water pollution.

Safety and Security received a mean satisfaction score of 3.9, indicating general satisfaction among visitors about crime levels and street lighting. However, the slightly lower score with higher variance suggests some visitors had concerns about security in certain areas, with varying perceptions influenced by the time of visit or specific park locations. The Maintenance domain received a mean score of 3.78, even though this rating places it within the satisfied range. The lower score, together with higher variance, indicates visitors observed issues concerning cleanliness in addition to problems with infrastructure and waste management. The overall mean satisfaction score indicates that visitors were generally pleased with their park experience. However, improvements in maintenance and safety could lead to an even higher level of satisfaction. The high scores in most categories indicate strong visitor loyalty, with many expressing a willingness to return to the park.

**Visitor Perspectives on Park Experience**

The focus group discussions (FGDs) and the key informant interviews (KIIs) gave us more insights into the visitor experiences in Dhanmondi Lake Park, which served as additional information to the survey results. Interviewees in divergent user categories also gave a common answer to the question of what the park means to them, saying that it was a serene oasis to escape the hustle and bustle of the city, some saying it has a "daily medicinal effect" on people who went to walk in the mornings, and that it offered an excellent place where children and the elderly could interact with each other and witness the beauty of nature. Points of highly appreciated recreational facilities, an attractive environment, and convenient access to the park as made many visitors remark through high recreation scores, environment scores, and location scores. A number of FGD participants and visitors in general expressed concerns about maintenance, especially in the areas of cleanliness and maintenance of facilities. According to one visitor, "The park is beautiful, but sometimes the garbage bins are overflowing." Mother Nature has also taken it upon herself to comment on inefficient lighting and, at times, safety hazards at night when visiting. Everyone seems to agree with this, given that both the visitors themselves and the park officials commented on this issue. An older person said, "I avoid the park after evening because it feels unsafe." Park management identified such challenges and stated funding as a reason, but more inter-agency coordination.

Frequency of Visits and BMI Distribution

A higher proportion of daily visitors fall within the normal weight category, indicating that consistent engagement with the park is associated with better weight management (Lachowycz & Jones, 2011). Figure 5 visually demonstrates the decline in the normal weight category as visit frequency decreases.

Figure 5

Analyzing The Visit Frequency Patterns and Body Mass Index (BMI) Levels of Visitors
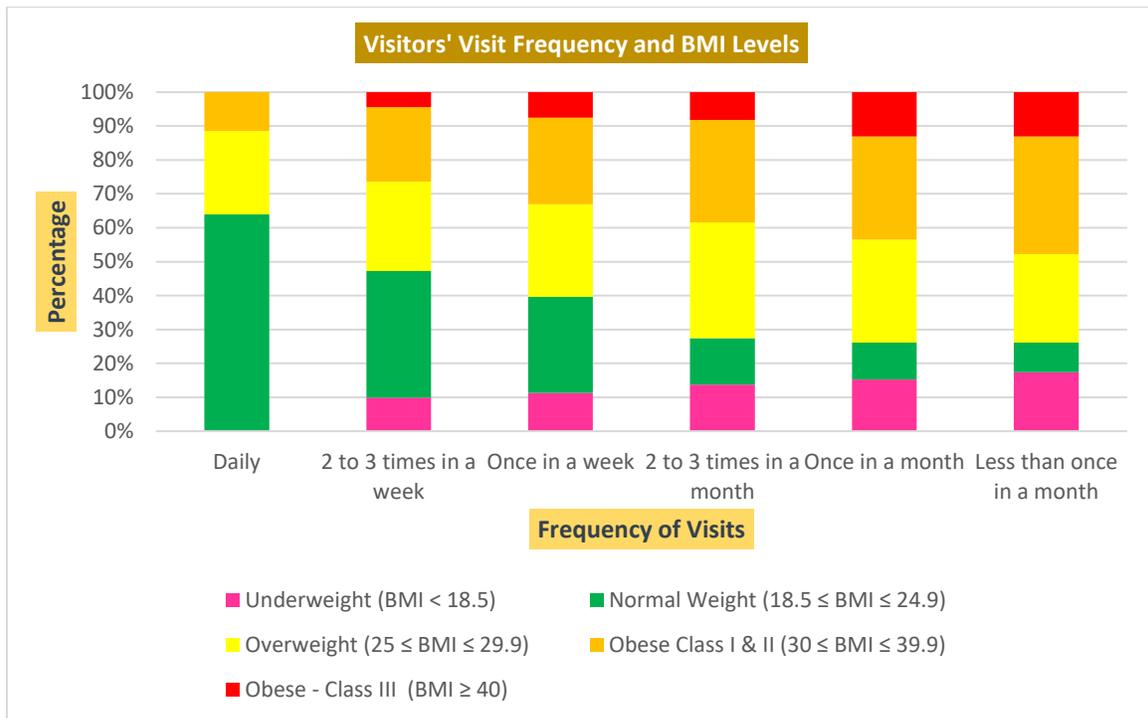
Relationship Between Visit Frequency and BMI

The statistical analysis shown in further highlights a strong relationship between visit frequency and BMI. A significant positive correlation (r = 0.934, p = 0.006) was found between more frequent visits and healthier BMI categories, emphasizing the role of consistent physical activity in maintaining a healthy weight (Han, 2021). This very strong positive association indicates that individuals who visit the park more frequently are considerably more likely to maintain a healthier BMI compared to those who visit infrequently.

Health-Related Motivations for Park Visitation

Feedback from focus group discussions and interviews with park management reinforced the observed patterns in BMI and visit frequency. Regular park users frequently cited health maintenance and physical activity as primary motivations for their visits. Many participants described the park as essential for their daily exercise routines, with one regular visitor noting, "I come here every morning to walk, and it helps

me keep my weight in check." Park management also observed that the most active users tended to be those most engaged in health-promoting activities.

Contribution of Dhanmondi Lake Park to SDG 11.7

By integrating analyses from visitor satisfaction and health outcomes, this study demonstrates that the park not only offers high levels of satisfaction across key dimensions, such as recreation. Accessibility and inclusivity, and environment, but also supports public health through its association with healthier BMI among frequent users. These findings highlight the park's multidimensional contribution to SDG 11.7 by promoting well-being, inclusivity, and environmental quality within a densely populated urban area.

Linking Visitor Satisfaction and Health Outcomes to SDG 11.7

Table 6 presents the linkage between key visitor satisfaction variables and specific aspects of SDG 11.7. Notably, accessibility and inclusivity, and recreation most strongly align with SDG 11.7's targets for universal access and inclusive recreational opportunities, while environment, maintenance, and safety reflect ongoing efforts and areas for further enhancement in achieving sustainable, well-maintained public spaces (Hsu et al., 2022). These results highlight the multidimensional contributions of urban greenspaces to SDG 11.7.

Table 6

Linking Visitor Satisfaction Variables in Urban Greenspaces to Sustainable Development Goal (SDG) 11.7: Ensuring Safe, Inclusive, And Accessible Public Spaces By 2030

Visitor Satisfaction Variable (Mean Score)	Corresponding Aspect of SDG 11.7	Explanation of Linkage to SDG 11.7	Contribution to the Broader Goal of SDG 11.7
Accessibility and Inclusivity (4.17)	Universal access for all ages, genders, and abilities	The high score of the park reflects that the park allowed accessibility for older people as well as disabled persons.	Contributes to **universal access** by ensuring inclusivity for everyone.
Safety and Security (3.9)	Safe and secure areas, especially for acutely needy groups	Measures of safety are already in place, but could be enhanced to equal the primary goal.	Covers **safety** in public areas, but it has to be further enhanced to achieve the best safety levels.
Recreation (4.3)	Availability of areas for recreation to ensure sound minds and good health	A significantly high level of satisfaction with recreational facilities plays a role in the improvement of well-being.	Promotes the overall goal by providing **inclusive and accessible recreational spaces** that improve the quality of life in cities.

Environment (4.02)	Environmentally sustainable and green public spaces	The encouraging effects of the park on the environment are in line with the sustainability aspect of the goal.	Endorses the development of *environmentally sustainable* public spaces that are green and livable.
Maintenance (3.78)	Functional, clean, and well-maintained public spaces	The maintenance efforts aim at the goal, but consolidation should be enhanced to ensure lasting effectiveness.	Facilitates *access to well-maintained* spaces, contributing to the subsequent maintenance of public areas.

Urban greenspaces promote the accomplishment of SDG 11.7 goals to ensure that protected areas are accessible to everyone by 2030 (Table 6). Public satisfaction measurements for Accessibility and Inclusivity (4.17) along with Recreation (4.3) perfectly match the SDG 11.7 criteria for inclusive recreational areas accessible to everyone. The public satisfaction ratings for the Environment section (4.02) validate the efforts made to create sustainable urban natural areas. The safety and security measurements (3.9) demonstrate further improvement of protective measures for safe public spaces. Clean operating spaces require continued maintenance work according to the current rating (3.78) in the Maintenance category. In addition to visitor satisfaction metrics, the strong association observed between frequent park use and healthier BMI among visitors demonstrates the park's contribution to public health. This finding directly supports SDG 11.7's emphasis on enhancing well-being through accessible, inclusive, and safe urban greenspaces. By providing opportunities for regular physical activity and fostering environments conducive to healthy lifestyles, Dhanmondi Lake Park exemplifies how greenspaces can help address urban health challenges, such as overweight and obesity, which are recognized as critical components of sustainable development.

SWOT Analysis of Dhanmondi Lake Park concerning SDG 11.7

A SWOT analysis, as depicted in Figure 6, was conducted to evaluate the strengths, weaknesses, opportunities, and threats associated with Dhanmondi Lake Park. (Azmi, 2023). The strengths of Dhanmondi Lake Park emerge from its diverse recreation possibilities, enhanced by good access and strategic location, while operating as an important urban relaxation area. The park supports walking with social activities and provides access for people of different ages. The green landscapes of the park create beneficial impacts on physical health and mental equilibrium. The park contributes to managing urban environmental problems such as heat island effects and noise pollution.

The park shows multiple weaknesses because of its inadequate maintenance standards, environmental disturbances, and security problems. The park's quality suffers because of deteriorating infrastructure and poor waste management issues that visitors note through their observations. Safety issues, especially in the evenings, inadequate lighting, and occasional anti-social behavior. The atmosphere of the park suffers disruption because of the water pollution generated by people visiting the lake area.

Figure 6.

A SWOT Analysis Outlines the Strengths, Weaknesses, Opportunities, And Threats Associated with Dhanmondi Lake

Strengths	Weaknesses
➢ Diverse Recreation Offerings	➢ Maintenance and Upkeep Challenges
➢ Strong Accessibility and Inclusivity	➢ Safety Concerns and Social Issues
➢ Strategic Location	➢ Minor Water Pollution
➢ Positive Health Impact	
➢ Environmental Benefits	

S W O T

Opportunities	Threats
➢ Improving Maintenance and Infrastructure	➢ Ongoing Environmental Degradation
➢ Expanding Accessibility and Inclusive Features	➢ Emerging Competition from New Recreational Spaces
➢ Strengthening Safety and Security Measures	➢ Risk of Encroachment and Land Development
➢ Adopting Sustainable Practices	➢ Youth Gang-related Crime and Anti-social Behavior

Source. Authors (2024).

The park's usability and sustainability can be improved through several development opportunities, including frequent waste management services and pathway maintenance strategies. The addition of wheelchair-accessible paths and quiet areas would improve universal accessibility at the park. Better security measures can be implemented through increased security personnel, CCTV monitoring systems, and improved lighting. Placing native vegetation and solar-powered lighting systems will establish a sustainable ecosystem for the environment. The park faces substantial sustainability threats from various factors like environmental degradation, urban competition, and safety risks. The presence of pollution harms the value of the lake, yet newly available recreational areas might cause changes in visitor preferences. Unauthorized development from urban sprawl, in addition to vandalism and criminal activity, acts as a deterrent for visitors.

Advancing SDG 11.7 through Urban Greenspace Management

To make sure that Dhanmondi Lake Park will sustain its contribution to the aims of SDG 11.7 in the future, it will be important to address the specified weaknesses and threats, especially in the spheres of maintenance, safety, and environmental management. Considering its resource and opportunity endowments that include a variety of recreation options and a strategic location, as well as carrying out specific improvements in the areas that have been identified, the park has the potential to continue fulfilling the role model of sustainable, inclusive, and health-promoting urban greenspaces. With a combination of visitor satisfaction level and health indicators like the BMI, the study will offer a thorough assessment of the extent to which Dhanmondi Lake Park ensures the achievement of the SDG 11.7 objectives. A combination of two dimensions, perceived quality of the greenspace, and measurable health benefits, presents a strong body of evidence of a rather diversified role of the park in sustainable urban development and subjective well-being.

DISCUSSIONS

"Urban greenspaces are the soul of a livable city, where concrete breathes and communities thrive," said William H. Whyte (Whyte, 2001). The concrete-dominated Dhaka needs Dhanmondi Lake Park and other such green areas for its urban inhabitants. The acute need to take care of greenspaces already present within urban areas is reinforced by current land usage analysis in Bangladesh, which shows that, despite less than two decades of rapid growth, the country has lost a substantial portion of its green cover due to urbanization, with agricultural land dropping by 38.66%, water bodies shrinking by 4.78%, and built-up space rising to 47.38% during that period (Hossain et al., 2025). Greenspaces in urban environments fulfill both recreational and vital ecological and social duties to enhance wellness among people and strengthen community resilience. (Miguez et al., 2025). Visitor satisfaction reaches high levels with regard to recreational facilities, beautiful environments, convenient access points, and ideal site position. People view the park as a peaceful refuge from urban noise, which enables children to play and both elderly and young adults to enjoy time in nature and away from screens. Urban greenspaces, such as Dhanmondi Lake, are crucial for controlling the microclimate by reducing daytime temperatures, underscoring the need to preserve and develop greenspaces to mitigate heat and ensure thermal comfort in fast-growing cities (Tahia et al., 2025). This is especially true for bigger parks with diverse vegetation, which are more effective at mitigating heat and creating cool spots that enhance public comfort in surrounding areas (Odri et al., 2025). Morning walk near the lake serves as a daily medicinal effect that sustains people. (Olcoń et al., 2023). Some respondents were worried about maintenance standards and security issues, and the lack of proper evening lighting highlights the need for safety and security in urban planning.

People who visit parks frequently show lower BMI scores, which demonstrates that public spaces help prevent urban sedentary behavior, and people living near such areas tend to have improved health results. The identified findings point towards appropriate preventative public health solutions for a city like Dhaka, which experiences growing rates of non-communicable diseases. Irregular park users often have higher BMI scores, indicating that less exposure to greenspaces may be linked to health risks. One key informant stated, "People don't just need hospitals, they need prevention. Parks can be that prevention." Dhanmondi Lake Park promotes SDG 11.7 directly as the park serves as a safe, inclusive, and accessible area of public

spaces that support the well-being of the urban population (Hsu et al., 2022). Such high levels of recreation satisfaction, accessibility, and environmental quality, and the potential to enhance BMI among frequent users, demonstrate that well-maintained greenspaces are not only local amenities but the catalyst towards sustainable urban development in general. Such findings have been in line with the findings of other global cities, which have correlated urban greenspaces with better social and health outcomes. The systematic response to the current issues of maintenance and safety will also enhance the leadership position of the park as a pattern of meeting SDG 11.7 in quickly urbanizing cities, such as Dhaka. The study highlights the need to combine the sphere of greenspace planning and management with global sustainability priorities and make sure that cities develop in accordance with the UN vision of an inclusive, healthy, and resilient city by 2030.

Data gathered from KII participants revealed three major systemic problems inside Dhanmondi Lake Park regarding funding limitations for routine upkeep and external pressures from development, as well as insufficient collaboration between agencies. Local authorities recognize that Dhanmondi Lake Park demands comprehensive urban policies in addition to landscape improvements supported by active community participation. The SWOT analysis provides extra emphasis on the necessity of this action. Dhanmondi Lake Park maintains ecological significance, user contentment, and aesthetic attractiveness, but users encounter problems such as safety risks, challenging nighttime visits, and inconsistent upkeep. Still, opportunities exist through urban greening programs and youth organizations that lead to sustainable change.

This study also has some limitations. The use of BMI as the sole health indicator offers a narrow lens into the broader health implications of greenspace exposure. More robust indicators like blood pressure, heart rate, or mental health scales would deepen our understanding. Another limitation lies in generalizability, while Dhanmondi Lake Park provides a model example, findings may differ in other parts of Dhaka where greenspaces are either more fragmented or entirely absent. Ultimately, urban greenspaces are more than recreational backdrops; they are platforms for urban healing. They serve the child and the senior, the rich and the poor, offering democratic access to nature in a rapidly unequal world. Policy must not treat these areas as optional luxuries, but as essential services, as vital to a city's health as clean water or public transportation. With thoughtful planning, inclusive design, and collaborative management, greenspaces like Dhanmondi Lake Park can indeed become the green lungs of Dhaka, where satisfaction and health go hand in hand.

RECOMMENDATIONS

This study proposes a structured framework to guide policy and planning efforts aimed at maximizing the social, environmental, and health benefits of urban greenspaces, with a specific focus on Dhanmondi Lake, as illustrated in Figure 7. The framework transitions from the overarching goal to the more targeted objectives. The transformation is operationalized through seven interconnected and sequential policy steps divided into two phases: identifying key intervention areas and monitoring outcomes.

Figure 7.

Seven-Step Sequential Policy Framework to Achieve Sustainable Urban Greenspaces.
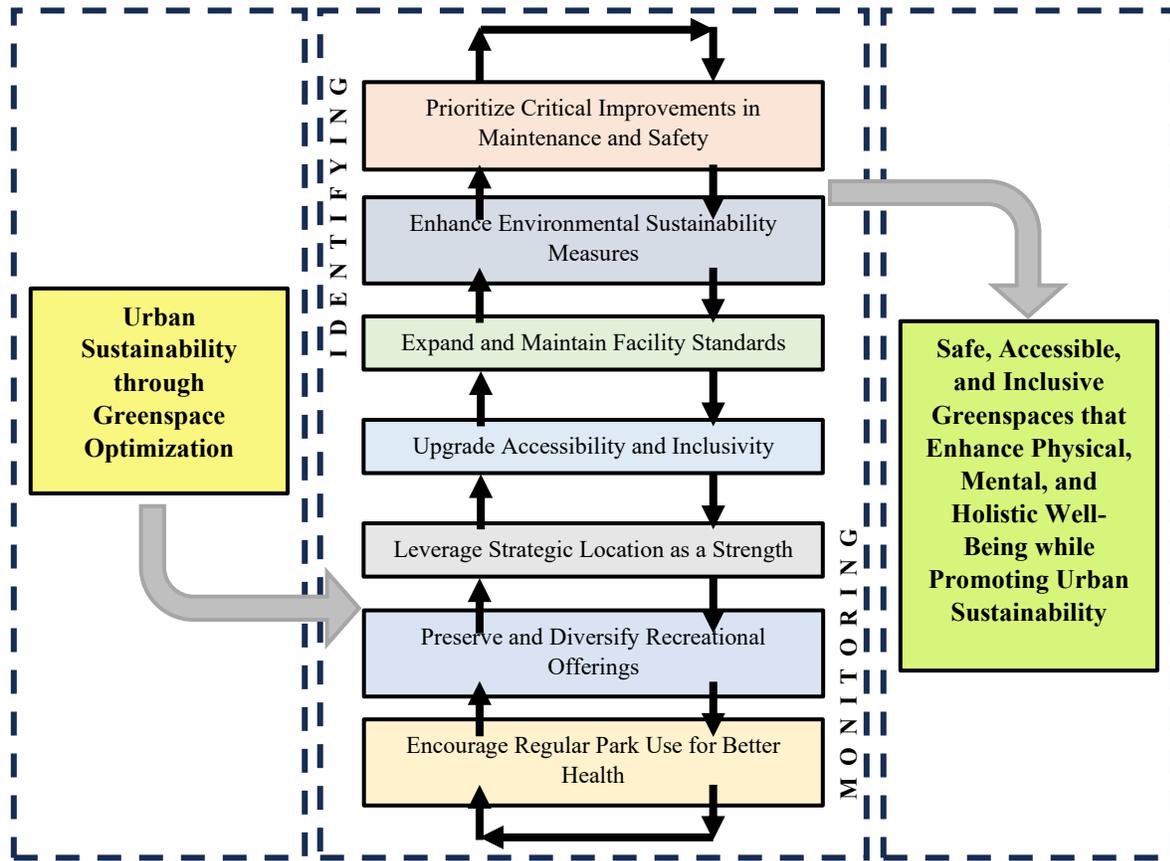
Source. Authors (2024)

Ensuring basic cleanliness, proper lighting, surveillance, and routine maintenance is essential to make greenspaces welcoming and secure for all user groups. Enhancing eco-friendly practices, such as biodiversity protection and water quality improvement, will strengthen ecological resilience (Dias, 2023). Expanding and standardizing amenities (e.g., washrooms and parking availability) will increase usability and support longer and more diverse park visits. Upgrading access for people with disabilities enhances equity and public value. Utilizing the high connectivity and visibility of greenspaces like Dhanmondi Lake can strengthen their integration into urban life, increase public engagement, and support multi-functional land use. A wide range of passive and active recreational options in a more organized way will cater to diverse user needs and foster broad appeal. Awareness programs on 'Greenspace Improves Public Health and Well-Being' with some evidence-based examples will encourage people to visit the park on a regular basis. These seven policy measures provide a multidimensional approach to urban greenspace planning. This framework serves as an example for urban policymakers and planners seeking to transform greenspaces into essential assets for sustainable urban development.

CONCLUSION

Urban greenspaces are essential in achieving Sustainable Development Goal 11.7 for proper design and access to public spaces, supporting fast-growing urban cities. Evaluating Dhanmondi Lake Park as a study site to show how visitors express substantial satisfaction with recreational possibilities, park accessibility, and environmental excellence proves that well-planned urban green areas hold crucial importance for urban livability. Dhanmondi Lake Park maintains dual purposes as it allows urban dwellers to escape city pressures while providing suitable environments for physical wellness and mental balance, which strengthens individual health together with neighbourhood harmony. The study demonstrates positive effects; however, maintenance problems together with safety issues restrict the park from achieving its complete performance. A SWOT analysis and interviews with stakeholders have identified critical shortcomings in infrastructure support and funding, as well as institutional coordination, which demand urban policies to secure greenspace sustainability. The proposed policy structure establishes an effective solution for dealing with these challenges. Greenspaces must be recognized as vital urban infrastructure as Dhaka and other cities expand their populations. Cities should develop policies that recognize greenspaces have multiple benefits beyond visual appeal to transform urban environments. Proper inclusive planning paired with continuous investment will enable Dhanmondi Lake Park and similar spaces to remain urban centers of green life, which support healthier and more sustainable city development.

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