

ACCESS TO DRINKING WATER, SANITATION AND HYGIENIC FACILITIES FOR PEDESTRIANS IN DHAKA SOUTH CITY CORPORATION: AN ANALYSIS

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ABSTRACT

Ensuring free access to drinking water, sanitation and hygiene facilities for pedestrians in urban areas is a major challenge for Bangladesh. Free access to drinking water, sanitation and hygiene services is declining in poor urban areas, especially in Dhaka, the capital of Bangladesh. Lack of access to free drinking water, sanitation and hygiene services in the Dhaka South City Corporation (DSCC) poses a challenge for Bangladesh to achieve targets 6.1 and 6.2 of the United Nations Sustainable Development Goals (SDG) which aim to provide universal access to adequate drinking water, sanitation and hygiene for all. In order to figure out whether pedestrians of Dhaka South City Corporation have free access to drinking water, sanitation and hygiene services, this research concentrated on three areas namely Shahbag, New Market and Kalabagan. At present, Dhaka South City Corporation has a population of 4,299,345 people whereas the data was collected through a questionnaire survey from 600 pedestrians. The results reveal that 16.67% of pedestrians have free access to drinking water and the other 83.33% of pedestrians do not have free access to drinking water. On the other hand, only 7.83% of pedestrians have free access to sanitation service and 92.17% of pedestrians do not have free access to sanitation service. In Dhaka South City Corporation, only 1.17% of pedestrians have free access to hygiene service and 98.83% do not have free access to hygiene service. These results highlight the fact that the targets of SDG 6.1 and 6.2 have not yet been accomplished. Finally, Dhaka South City Corporation should take steps to ensure free access to drinking water, sanitation and hygiene services to achieve SDG targets 6.1 and 6.2 in the DSCC area.

Keywords: *Drinking Water, Sanitation, Pedestrians, SDG targets 6.1 and 6.2, Dhaka South City Corporation.*

1. INTRODUCTION

Water is an invaluable resource that is fundamental to sustaining life and promoting health and well-being. Ensuring free access to safe drinking water is a crucial component of promoting a healthy and growing society. Additionally, water plays a pivotal role in sanitation and hygiene practices which are integral to preventing the spread of infections and maintaining a clean and hygienic environment. The accessibility of free drinking water, adequate sanitation and hygiene facilities is fundamental for ensuring the health and well-being of communities on a global scale. Free access to clean water is essential for promoting proper hydration, preventing waterborne illnesses and maintaining overall health. Similarly, free access to sanitation and hygiene facilities is crucial for protecting hygiene standards, decreasing the spread of diseases and creating a safe living environment. It is also a fundamental pillar of sustainable urban development. In the context of Dhaka South City Corporation (DSCC), a megacity that is representative of rapid urbanization and urban challenges, the issues of free drinking water access, sanitation and hygiene facilities for pedestrians take on major importance. Promoting the universal availability of free drinking water and easily accessible sanitation and hygiene services, as outlined in SDG targets 6.1 and 6.2, is vital in enhancing the overall living standards of urban populations and addressing the harmful consequences of rapid urbanization.

SDG targets 6.1 and 6.2, under the 2030 Agenda for Sustainable Development adopted by the United Nations, set ambitious targets. SDG 6.1 seeks to “Achieve universal and equitable access to safe and affordable drinking water for all by 2030”. Simultaneously, SDG 6.2 aims to “Achieve access to adequate and equitable sanitation and hygiene for all by 2030”. Free access to drinking water, sanitation and hygiene services is of paramount importance in meeting Sustainable Development Goal (SDG) targets 6.1 and 6.2 as it directly impacts public health, well-being and environmental sustainability. There has never been any research done before to exactly meet the targets for pedestrians. While there is research on achieving SDG targets 6.1 and 6.2 in particular sectors, no prior studies have investigated free access to drinking water, sanitation and hygiene services specifically for pedestrians. Achieving SDG targets 6.1 and 6.2 is not only a matter of human rights but also a foundation for overall sustainable development, contributing to health, economic growth and environmental conservation. It's essential for building healthier, more equitable and sustainable communities. The availability of safely managed drinking water is gradually decreasing. Now, it is important to know about the current situation of Dhaka South City Corporation.

1.1 Objectives of the Research

The main objectives of this research are:

- To assess the current status of free access to drinking water, sanitation and hygiene services for pedestrians in Dhaka South City Corporation (DSCC) in comparison with targets 6.1 and 6.2 of Sustainable Development Goal (SDG) 6.
- To identify the challenges for enhancing access to free drinking water, sanitation and hygiene services in Dhaka South City Corporation in alignment with SDG targets 6.1 and 6.2.

2. METHODOLOGY

2.1 Study Area

Dhaka South City Corporation (DSCC) is one of the busiest cities in Bangladesh. To gain a comprehensive understanding of the current status of the free access to drinking water, sanitation and hygiene services for pedestrians in DSCC, field survey was conducted into three diverse areas, i.e., Kalabagan, Shahbag and New Market. These areas serve as representative samples of free access to drinking water, sanitation and hygiene services for pedestrians within Dhaka South City Corporation. Kalabagan, with its blend of residential and commercial neighbourhoods, showcases the dynamic interplay between community living and business activities. Shahbag, home to cultural and educational institutions, represents the individuality of urban life. New Market, a thriving shopping district, highlights the significance of drinking water, sanitation and hygiene services for pedestrians.

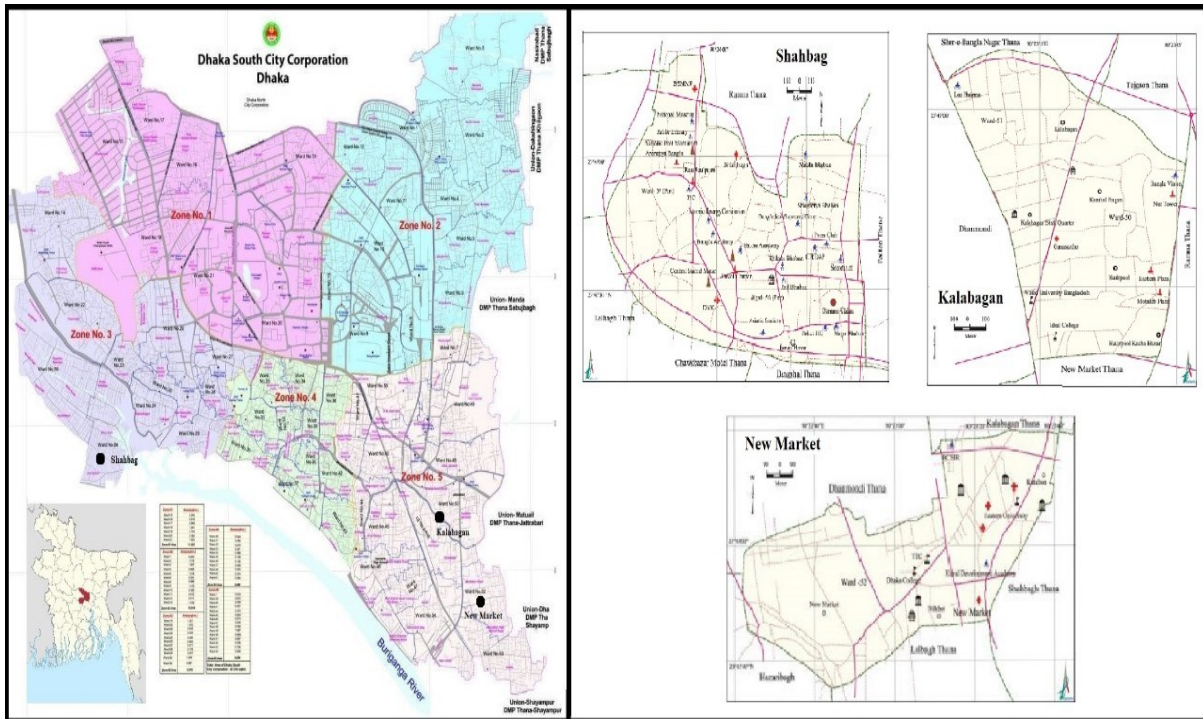
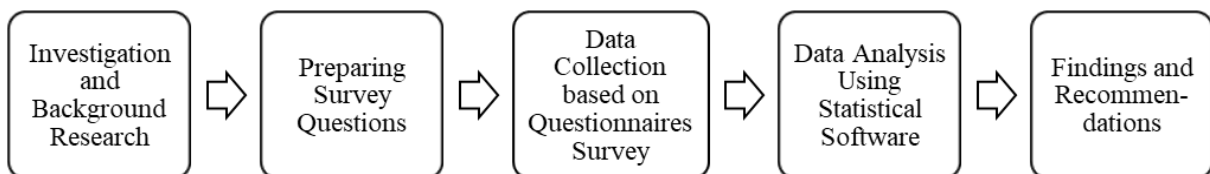


Figure 1: Study area of Dhaka South City Corporation.
Source: Mediabangladesh (2023).

2.2 Research Design

This study employs a mixed-methods research design to comprehensively assess the current situation of free access to drinking water, sanitation and hygiene services for pedestrians in Dhaka South City Corporation (DSCC). The mixed-methods approach integrates both qualitative and quantitative data collection methods using for more general understanding of the issue. The three different areas selected for the survey - Kalabagan, Shahbag and New Market. By analyzing these areas gives an idea about the availability of free Access to drinking water, sanitation and hygiene services in DSCC.



2.2.1 Data Collection

A structured survey questionnaire is developed through the investigation from pedestrians perceptions in Dhaka South City Corporation. This survey includes several key aspects. It begins by examining pedestrian’s demographics including their age, gender, location and occupation. This survey investigates the accessibility of free drinking water sources for pedestrians. Additionally, this research investigates the availability of public sanitation with hygiene services. This study concludes by incorporating open-ended questions designed to capture pedestrians on the various challenges in accessing free drinking water, sanitation and hygiene facilities.

2.2.2 Data Analysis

This research employs two distinct data analysis methods: first one is qualitative data analysis and another is quantitative data analysis. Analyzing data through these two methods provides a comprehensive understanding of the current situation of free access to drinking water, sanitation and hygiene services.

2.2.2.1 Qualitative Data Analysis

Surveying on Kalabagan, New Market and Shahbag provides an overall situation of Dhaka South City Corporation. This survey focused on the availability, distance and quality of water sources. Simultaneously, assessed the accessibility and hygiene of public sanitation facilities. It helps to identify available water sources, assess sanitation and hygiene facilities, determine distances and evaluate source quality. This comprehensive approach allows to understand how accessible and safe these resources are for the pedestrians in Dhaka South City Corporation.

2.2.2.2 Quantitative Data Analysis

Quantitative data obtained from survey questionnaires was processed and analyzed using statistical software. A simple random sampling approach is employed to ensure the representation of various demographic groups for Dhaka South City Corporation. A total sample size of 600 individual's data were selected as a sample using a simple random sampling method. The margin of error was set at 3% indicating the degree of potential error that could be present in the sample's representation of the entire population. To ensure that the data accurately reflects the pedestrian's experiences within Dhaka South City Corporation (DSCC), 200 individuals were surveyed in each of the three chosen areas: Kalabagan, Shahbag and New Market.

To determine the present condition of SDG targets 6.1 and 6.2, this research examines data concerning indicators 6.1.1 and 6.2.1, which measure the percentage of the population using safely managed drinking water services (6.1.1) and the percentage of the population utilizing safely managed sanitation services, including hand washing facilities with soap and water (6.2.1). The criteria for drinking water, sanitation and hygiene services as established by WHO (2017a) are applied in this study to assess the present situation of targets 6.1 and 6.2 within the Dhaka South City Corporation.

Table 1: Drinking water service levels and relevant conditions.

Drinking water service levels	Conditions
Safely managed drinking water service	Improved drinking water sources
	Located on premises: drinking water collection time 10-20 min
	Available when needed: 24-h water supply
	Free from chemical contamination
Basic drinking water service	Improved water sources
	Round trip collection time within 30 min
Limited drinking water service	Improved water sources
	Round trip collection time over 30 min
Unimproved drinking water service	Unimproved water sources
	Sources does not protect against contamination
No service	Water collects from surface water such as river, pond, canal, etc.

Source: WHO (2017a, p. 8).

Table 2: Sanitation access service levels and relevant conditions.

Sanitation service levels	Conditions
Safely managed sanitation service	Private: do not share the toilet with other households
	Improved facility
	Faecal wastes are safely disposed on side or transported and treated off-site
Basic sanitation service	Private: do not share the toilet with other households
	Improved facility
	Excreta separate from human contact
Limited sanitation service	Share the toilet with other household
	Improved facility
Unimproved sanitation service	Unimproved facility
	Does not excreta separate from human contact
No service	Open defaecation

Source: WHO (2017a, p. 8).

Table 3: Hygiene access service levels and relevant conditions.

Hygiene access levels	Conditions
Basic hygiene access	Hand washing facilities with soap and water should be available on the premises
Limited hygiene access	Have a facility without soap and a family member uses another agent such as ash, soil, sand
No service	No hand washing facility on premises

Source: WHO (2017a, p. 9).

Tables 1, 2 and 3 provide a comprehensive idea about the service levels for drinking water, sanitation and hygiene respectively along with their associated conditions. These tables offer a structured framework for assessing the quality of these essential services for pedestrians in Dhaka South City Corporation. By categorizing these services into specific levels and detailing the relevant conditions, these tables enable a systematic evaluation of the extent to which indicates the well-managed and safe drinking water, sanitation and hygiene facilities.

3. ANALYSIS AND RESULTS

This research extensively investigates the accessibility of free drinking water, sanitation and hygiene services for pedestrians in Dhaka South City Corporation focusing on the areas of Shahbag, Kalabagan and New Market. Additionally, it also analyzes the service levels of drinking water, sanitation and hygiene facilities. The results will be evaluated concerning the objectives outlined in SDG targets 6.1 and 6.2.

4. Free access to drinking water for pedestrians

The findings from this survey reveal that only 16.67% of pedestrians have access to free drinking water in Dhaka South City Corporation. In Kalabagan, approximately 21% of pedestrians can readily access free drinking water while a substantial 79% face challenges in obtaining this vital resource. Shahbag shows a similar trend with only 12.5% of pedestrians having access to free drinking water. New Market shows comparable results with approximately 16.5% of pedestrians having access while a majority constituting 83.5% face obstacles in securing free access to drinking water.

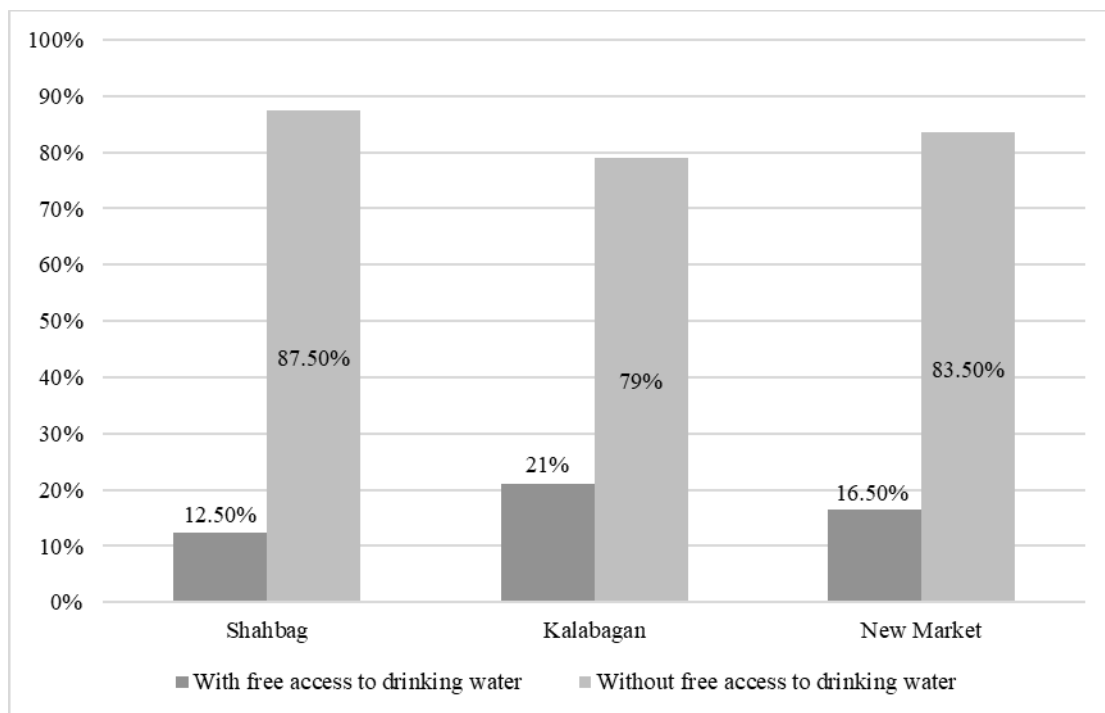


Figure 2: Comparison of having free access and without having free access to drinking water service for pedestrians in Shahbag, Kalabagan and New Market. Source: Field survey (2023).

5. Free access to sanitation and hygiene services for pedestrians

The survey highlights that only 7.83% of pedestrians have free access to sanitation service and 1.17% of pedestrians have hygiene service in Dhaka South City Corporation. In Shahbag, only 5% have free access to sanitation service and 100% do not have hygiene service. Kalabagan shows that 10.5% of pedestrians have free access to sanitation service and 3.5% have hygiene service. New Market reflects these trends with 8% having free access to sanitation service and 100% do not have hygiene service. This result highlights that the majority of pedestrians have to depend on unhygienic sanitation solutions.

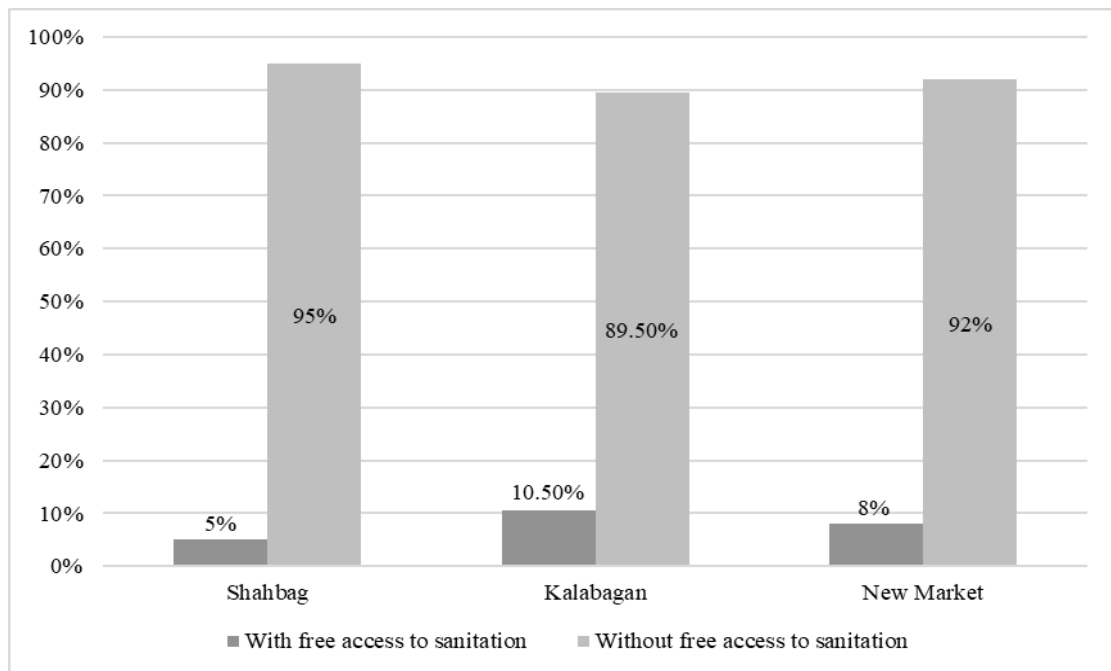


Figure 3: Comparison of having free access and without having free access to sanitation for pedestrians in Shahbag, Kalabagan and New Market. Source: Field survey (2023).

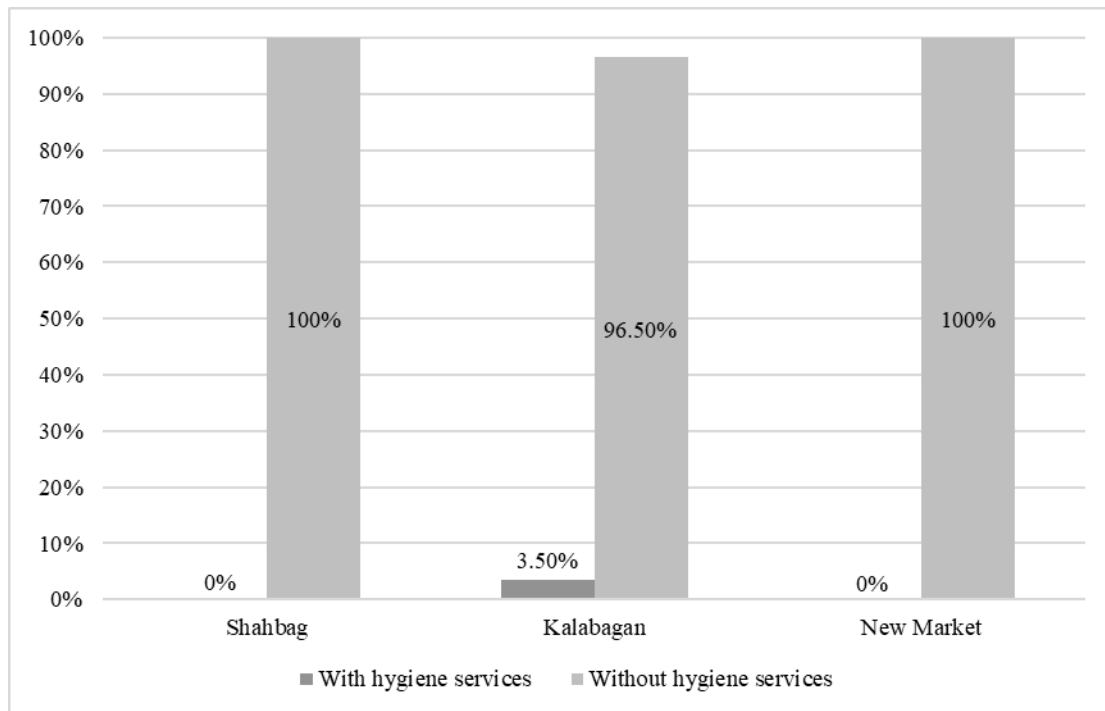


Figure 4: Comparison of having access and without having access to hygiene service for pedestrians in Shahbag, Kalabagan and New Market. Source: Field survey (2023).

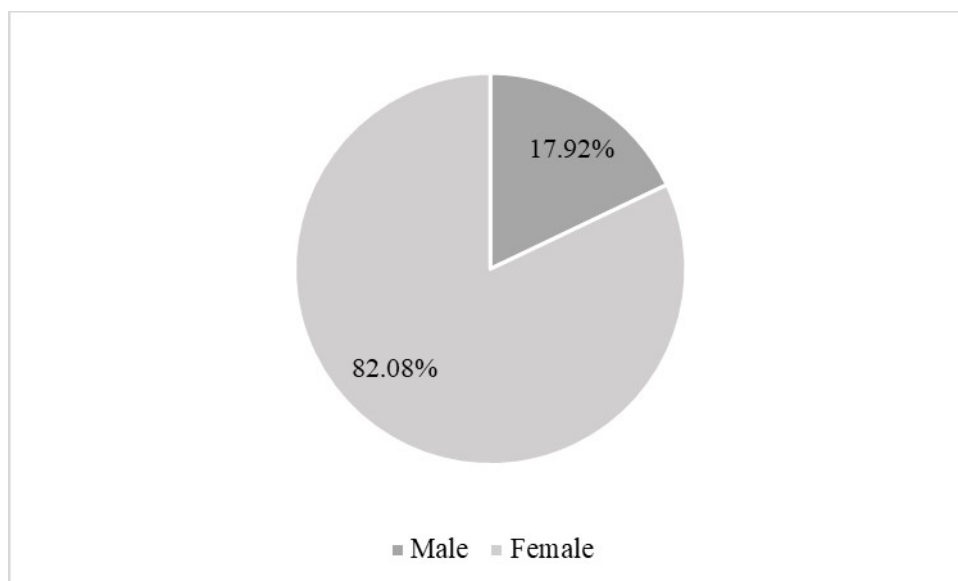


Figure 5: Comparison of having free access and without having free access to drinking water, sanitation and hygiene services for male and female pedestrians in Dhaka South City Corporation. Source: Field survey (2023).

The data reveals a concerning gender inequality, particularly for female pedestrians in obtaining free access to drinking water, sanitation and hygiene services. The majority 82.08% of female pedestrians face challenges in securing free access to drinking water, sanitation and hygiene services, highlighting a greater difficulty for women compared to men. Addressing this gender gap is essential not only for promoting equality but also for ensuring the well-being and dignity of all pedestrians, regardless of gender.

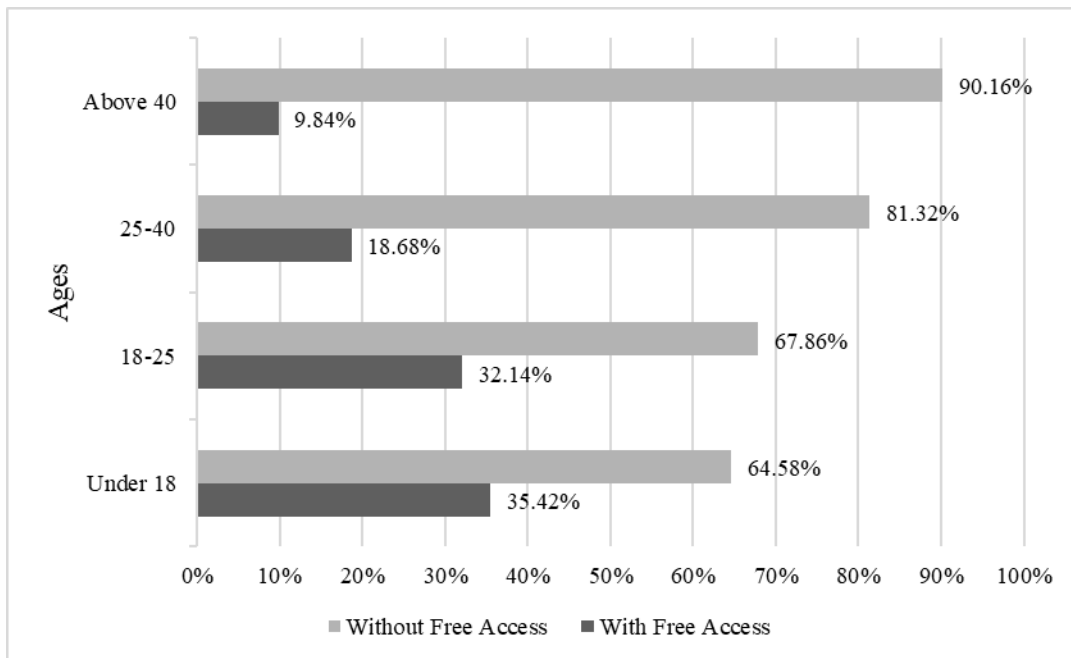


Figure 6: Comparison of having free access and without having free access to drinking water, sanitation and hygiene services for different age group of pedestrians in Dhaka South City Corporation. Source: Field survey (2023).

The analysis of age demographics of pedestrians free access to drinking water, sanitation and hygiene services reveals notable trends. Pedestrians under 18 years old have a relatively higher free access rate 35.42%, while 64.58% do not get free access to drinking water, sanitation and hygiene services. Moving to the age group of 18-25, 32.14% of pedestrians enjoy free access to drinking water, sanitation and hygiene services. 18.68% of pedestrians among 25 to 40 years of age have access to drinking water, sanitation and hygiene services. Lastly, for pedestrians above 40 years old, only 9.84% have free access to drinking water, sanitation and hygiene services. This age-based analysis indicates that there is a notable difference in free access to these services across different age groups with the younger population facing comparatively better access than the older age brackets. However, due to a lack of willingness among most pedestrians to share their income details, it is not possible to find access to free drinking water, sanitation and hygiene services among the different income groups. This survey covered both male and female pedestrians across various age groups during October and November 2023. However, the objective of this research is to find out the pedestrians' access to free drinking water, sanitation and hygiene facilities in the study areas and hence, the variation of pedestrians' access to free drinking water, sanitation and hygiene services in different months or seasons was not analyzed in this study, It is suggested that the future research on this topic should focus on the seasonal variations of the pedestrians' access to free drinking water, sanitation and hygiene services.

As seen earlier, some pedestrians get free access to drinking water and a small proportion of pedestrians benefit from free access to sanitation and hygiene services. By collecting information from pedestrians, Table 4 reveals the rate of service levels for those who receive free access to drinking water, sanitation and hygiene services. It is shown here that the percentage of drinking water, sanitation and hygiene service levels is provided for Shahbag, Kalabagan and New Market.

Table 4: Drinking water, sanitation and hygiene services levels for those who have free access.

Categories	Service levels	Shahbag	Kalabagan	New Market
Drinking water	Safely managed drinking water service (%)	0	0	0
	Basic drinking water service (%)	20	11.90	0
	Limited drinking water service (%)	28	59.53	21.21
	Unimproved drinking water service (%)	52	28.57	78.79
Sanitation	Surface water (%)	0	0	0
	Safely managed sanitation service (%)	0	0	0
	Basic sanitation service (%)	0	0	0

	Limited sanitation service (%)	0	61.90	0
	Unimproved sanitation service (%)	100	38.10	100
	Open defaecation (%)	0	0	0
Hygiene	Basic hygiene access (%)	0	0	0
	Limited hygiene access (%)	0	33.33	0
	No handwashing facility (%)	100	66.67	100

Source: Field survey (2023).

6. DISCUSSION

The research report comprehensively explores the critical issue of free access to drinking water, sanitation and hygiene services for pedestrians in Dhaka South City Corporation with a focus on the areas of Shahbag, Kalabagan and New Market. This research investigates the rate of service levels and challenges of these essential services aligning with SDG targets 6.1 and 6.2.

6.1 Target 6.1: Achieve universal and equitable access to safe and affordable drinking water by 2030

The survey data reveals significant differences in the availability of free access to drinking water among pedestrians in three distinct areas: Kalabagan, New Market and Shahbag. In Kalabagan, a relatively high percentage of pedestrians, amounting to 21%, have free access to drinking water due to the presence of a free drinking water supply system from DWASA (Dhaka Water Supply and Sewerage Authority). Additionally, some pedestrians can also reduce their thirst at nearby hotels. However, the majority, 79% of pedestrians, do not have free access to drinking water and pedestrians either spend money on drinking water or stay dehydrated. In contrast, New Market shows a slightly lower percentage of pedestrians, approximately 16.5% who can access drinking water without cost. However, the remaining 83.5% can not access free drinking water sources. Those who do drink water from nearby hotels are at risk of consuming unimproved water potentially leading to health issues. Shahbag, a busy area, reveals that only 12.5% of pedestrians have free access to drinking water. This limited access is not from any kind of free drinking water supply system; it comes from nearby hotels. The majority, comprising 87.5% of pedestrians, have no feasible options for free drinking water and are forced to spend money on this basic necessity.

According to drinking water service levels, in Kalabagan, this survey data reveals a significant gap in the availability of safely managed drinking water services with 0% meeting this crucial standard. In this area, 11.90% have basic services while 59.53% rely on limited water sources and 28.57% depend on unimproved water sources. These results highlight the urgency of enhancing water quality and availability. New Market presents a similar trend with 0% accessing safely managed drinking water services and also with 0% access to basic drinking water services. 78.79% relies on unimproved water sources and 21.21% depend on the limited drinking water service. Places like New Market where the pedestrian rate is high, still there is a huge lack of free drinking water sources. Most of the free drinking water sources are unimproved. Shahbag faces challenges with 0% meeting the safely managed services. Instead, 72% depend on unimproved water sources. It's concerning that 28% of the pedestrians access only limited drinking water services. So, most of the free drinking water sources available in Shahbag are unimproved. This situation emphasizes the need for infrastructure improvements and initiatives to ensure safe and accessible free drinking water for pedestrians.

6.2 Target 6.2: Achieve access to adequate and equitable sanitation and hygiene for all by 2030

The survey data highlights that Kalabagan shows that 10.5% of pedestrians have access to free sanitation and 3.5% get hygiene facilities whereas 96.5% do not have any hygiene facilities. However, it remains a challenge for the vast majority, amounting to 89.5%, who do not have any free access to sanitation service. From the toilet of the waiting room in bus station, pedestrians are getting free access to sanitation service. New Market reports limited free access to sanitation, with only 8% of pedestrians having free access to sanitation service without any hygiene facilities. The majority, 92%, face difficulties in accessing free sanitation facilities. This situation not only affects the suitability and

well-being of pedestrians but also raises concerns about public health and hygiene standards in the area. In Shahbag, only 5% of pedestrians have the privilege of free access to sanitation service without any hygiene facilities, while a majority, constituting 95%, lack free access to sanitation. Shahbag has more pedestrian traffic as it has more essential structures including a well-known hospital. However, there is a significant lack of free access to sanitation and hygiene services.

According to sanitation and hygiene service levels in Kalabagan, there is no reported presence of safely managed sanitation service, basic sanitation service and basic hygiene access. The majority, approximately 61.90%, falls under the category of limited sanitation service and 33.33% getting limited hygiene access. Additionally, 38.10% of sanitation facilities fall under the category of unimproved sanitation service suggesting that a significant portion of the population lack free access to sanitation service and 66.67% do not get any hygiene facilities. New Market presents a concerning scenario where none of the pedestrians have access to safely managed sanitation service, basic sanitation service and also none of the pedestrians have any hygiene facilities. The data indicates that 100% of free sanitation facilities in New Market fall under the category of unimproved sanitation service suggesting that the quality of sanitation facilities may be below standard and potentially pedestrians risks to public health. However, it's worth noting that there is no open defecation in New Market. In Shahbag, similar to New Market, there is no presence of safely managed sanitation service and basic sanitation service. The data reveals that 100% of free sanitation facilities in Shahbag are categorized as unimproved sanitation service without any hygiene facilities. Open defecation is not reported in Shahbag.

From the result analysis and discussion of these three areas, get an idea about the overall implementation of SDG targets 6.1 and 6.2 in Dhaka South City Corporation. For the first target SDG 6.1, the absence of free access to drinking water in Dhaka South City Corporation suggests that more time and concerted efforts are needed to ensure that all pedestrians have free access to clean and affordable drinking water. Recognizing free access to safe drinking water as a fundamental human right and achieving this target remains essential for public health and well-being. The second target 6.2, focusing on sanitation and hygiene facilities, presents significant challenges in Dhaka South City Corporation. The data reveals that sanitation services in Dhaka South City Corporation often lack quality or are entirely absent without mostly absence of hygiene facilities. To meet the target of SDG 6.2, substantial investments in infrastructure and policy changes are imperative in Dhaka South City Corporation.

7. CONCLUSION AND RECOMMENDATIONS

This research assesses the current situation in achieving the SDG targets 6.1 and 6.2 related to universal access to safe drinking water, adequate sanitation and hygiene for all by 2030. The results reveal the percentage of free access to drinking water, sanitation and hygiene services in Dhaka South City Corporation (DSCC). The findings of this research summarized in table 5.

Table 5: The percentage of free access to drinking water, sanitation and hygiene services for pedestrians in Dhaka South City Corporation.

Facilities	With free access	Without free access
Drinking water (%)	16.67	83.33
Sanitation (%)	7.83	92.17
Hygiene (%)	1.17	98.83

Source: Field survey (2023).

To meet SDG targets 6.1 and 6.2, additional time, sustained efforts and collaborative action are imperative, involving investments in infrastructure, policy changes and awareness campaigns. This research highlights two primary challenges. Providing universal free access to safe drinking water, sanitation and hygiene services demands significant financial investments. Many communities in Dhaka South City Corporation may lack the financial resources required to improve the necessary infrastructure. The second one is the sustainability of these services remains a crucial challenge. Ensuring that the free drinking water supply, sanitation and hygiene services infrastructure requires

not only initial investments but also consistent maintenance and management. The absence of safely managed sanitation and basic sanitation services indicates that Dhaka South City Corporation may struggle to maintain the quality of services.

Addressing the critical issue of free access to drinking water, sanitation and hygiene services in Dhaka South City Corporation requires a multifaceted approach. First, there is an urgent need for substantial investments in infrastructure development to expand access and improve the quality of services. Public awareness campaigns should be launched to promote responsible water use and hygienic practices. Policymakers should prioritize the development of equitable policies that ensure free access for all. Engaging local communities in decision-making processes is vital to creating solutions that are sustainable and culturally appropriate. Finally, extending the timeline for achieving SDG targets 6.1 and 6.2 may be necessary to address the difficulty of the challenges.

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APPENDIX

Appendix A: Questionnaire regarding drinking water, sanitation and hygiene for pedestrians.

Question Number	Questions	Yes	No	Comments
01	Do you have free access to drinking water, as a pedestrian?			
02	What is the primary source of your drinking water?			
03	Is your drinking water free from contamination?			
04	How much time, on average, does it take you to collect drinking water? (In minutes)			
05	How many hours per day is the drinking water available?			
06	Do you have free access to sanitation, as pedestrian?			
07	What sanitation facility can you access?			
08	Does the sanitation facility have a system in place to safely collect, transport, and treat excreta off-site?			
09	Do you have access to handwashing facilities near the sanitation area?			