

# Assessing the Impact of Physical Accessibility on the Use of Shared Toilets in Slum Areas

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**Abstract**— The number of slum dwellers is increasing day by day and it also increases the demands of hygienic sanitation in slum areas. Several development organizations are advocating for shared sanitation systems to meet the needs of dense urban areas, particularly slums. Shared toilets are now regarded as one of the most effective slum sanitation solutions. Though shared toilets meet the sanitation demand, they fall short of providing adequate and equitable access due to some socio-physical factors. This paper attempts to investigate the physical aspects of shared toilets that reduce usage. The study's major aims are to evaluate the socio-physical accessibility factors of a shared toilet for increasing the frequent usage of it. Initially, this study looks at two different slums in Khulna, Bangladesh, where shared toilets are the primary sanitation option, and assesses their physical accessibility. This study primarily employs qualitative methods, but some quantitative data is also gathered to make the study more feasible. Open-ended questions, key person interviews, physical and social surveys are used to collect data. This study is expected to produce a set of strategic guidelines for shared toilets in slum areas, which will help to make them more accessible to all and ensure adequate usage.

**Keywords**— Physical accessibility: Shared toilets: Slum area: Usage.

## I. INTRODUCTION

Nowadays, the process of urbanization is spreading throughout the world. As a result of rapid urbanization, some consequent issues emerge, one of which is a lack of adequate sanitation facilities. While one of the main SDGs (Sustainable Development Goals) is to ensure clean water and sanitation for everyone, it appears to be a difficult task for those rapidly rising urban informal areas. According to SDG 6.2, they aimed to achieve access to adequate and equitable sanitation and hygiene for all, as well as the end of open defecation, by 2030, with a special focus on the needs of women and girls, as well as those in vulnerable situations. According to the SDGs, 2.6 billion people do not have access to improved sanitation, but this situation is changing on a daily basis. Because of the rapid growth in urban populations, the number of people living in cities without access to improved sanitation is increasing (WHO & UNICEF, 2010). To address the lack of sanitation facilities in those informal areas, the population employs a variety of practices ranging from open defecation to toilet sharing. (2010) (Adrien Mazeau, Brian Reed). In most cases, a shared toilet has partially fulfilled the demand of the sanitation facility in the slum area successfully. However, when a large number of people is sharing a toilet arise some problems too, most of the time, everyone in the slum does not

get equitable access facility due to some physical and social constrain.

In Bangladesh, around 2.23 million people are estimated as slum dwellers, and the number is increasing by 60% by the last 17 years (BBS, B. (2015). Here they lead a below standard lifestyle, with a lack of sanitation facility. Some organizations constructed shared toilets in slum areas to increase sanitation coverage. Shared toilets may increase the sanitation coverage in a slum area, but these solution does not run successfully due to some constraints, one of them is the ensuring the equitable access for all. The conditions of access, privacy, dignity, and cleanliness may not be met if such a facility is shared by two or more households. Due to the location of those toilets block, it is not easily accessible for all, the woman and children suffer most due to the accessibility problems. Most of the time universal accessibility is ignored, lack of universal accessibility facilities reduces the usage of shared toilets to the vulnerable groups (senior citizens and handicapped). So it is needed to develop a more physically accessible shared toilet to achieve the SDGs goal and ensure a safe sanitation system for all. Moreover, accessibility issues have a deep impact on the Usage of the shared toilets because a large number of slum dwellers are not frequently using the toilet according to their demand, and this aspect leads them to open defecation. Most of the time, the children are not using the shared toilets; rather, they use nearby drains or open spaces due to the lack of accessibility.

So this study seeks to answer the question, "Which physical and social-spatial accessibility factors can increase the use of shared toilets in the slum area?" The primary goal of this research is to develop some working guidelines for shared toilets that will ensure more equitable access for slum dwellers to safely use their respective shared facilities. In order to achieve this goal, the following objectives were chosen for this study:

- To identify the key constraints of physical aspects to ensure equitable accessibility in shared toilets.
- To investigate the relationship between the accessibility and Usage of shared toilets.
- To determine the physical and social accessibility factors for enhancing the frequent Usage of shared toilets.

This study is mostly concerned with the physical aspects of shared toilets to escalate the accessibility for all. The main area of this paper is the physical and spatial aspects of shared toilets. Emphasis is on identifying the main physical and socio-spatial vulnerabilities of access associated with shared

toilets in slum areas. Physical conditions, built environment, and management process are all examined in this regard.

## II. CONCEPTUALIZING THE PHYSICAL ACCESSIBILITY ASPECTS OF SHARED TOILETS

This research is mainly focused on the relation between the Usage and the physical and accessibility of shared toilets in slum areas. Before assessing the real scenario, it is needed to know about some general aspects of urban slum sanitation and the physical and socio-spatial accessibility catalyst of shared toilets. This study mainly helps to find out a set of socio-physical accessibility assessment criteria of a shared toilet.

### *The Need To Categories Shared Toilets.*

A shared toilet is currently the only pragmatic solution in many densely populated informal urban areas. The single category of 'shared sanitation' covers a wide range of options that are poorly understood, from overuse and poorly maintained public latrines in a market to a clean and private latrine shared by two neighbours. According to Shared and public toilets: Championing delivery models that work. (Cardone, R., et al. (2018). they show a common method of distinguishing between types of shared sanitation is to look at the user groups:

- Shared toilets which are shared between a group of households in a single building or plot. This may cover 20 tenant families, a toilet shared by three related families living within a single plot or compound.
- Community toilets are shared by a group of households in a community. This may be owned by a group of households. For example, slums, dense informal neighbourhoods, peri-urban settlements
- Public toilets are open to anybody; maybe the users are commuters, worshippers, workers. Typically, there will be a charge for each use which is in public places or residential areas.

This research mainly focused on the neighbourhood shared toilets in the slum area, and these toilets are mainly used by a single neighbourhood community.

Now, what are the physical aspects which are related with the accessibility of shared toilet?

According to the guidelines for public and community toilets management by cities in Andhra Pradesh (SAC, 2016), where they describe the key physical aspects of shared toilets which will be necessary to keep in mind while designing and managing shared toilets. The key physical aspects are location, accessibility, external structure, internal design, supporting infrastructure services, and technology for sewage disposal.

The physical aspects of the shared toilet are mainly categorized into three broad aspects

- Access to the infrastructure and external infrastructure- location of toilet blocks, their accessibility, and ratio with household these all are included in these part.
- Internal structure- facilities are more related to the size, safety, privacy, lighting, cleanliness, ventilation, fixtures, Sewer disposal, and water supply system.

- Management of shared facilities mainly concerns the coverage of shared facilities sludge management process and restriction of users' access. (SAC, 2016).

This paper is mainly discussed with the access to the infrastructure.

### *Physical Accessibility Factors:*

Hunt, C. (2001) describes as, the distance is only one-factor determining accessibility; this can be modified by the physical access to the facility perceptions of safety, cleanliness (van der Hoek et al. 2010), cultural barriers, and the cost of services. People with restricted physical mobility may have fewer options (Jones & Reed, 2005). Accessibility is also regulated by cultural and social representation. Only less distance is not ensuring the accessibilities of shared toilets it also depends on the socio-cultural behavioural pattern.

### *Location:*

The location of sanitation facilities is linked with the use of shared sanitation. The distance between the household and the shared sanitation facility will play a key role in the ease of use (TARU & WEDC 2005). The WASH (2008) has an observation that there is a tendency to locate toilets and urinals close to other "odor and fly producers," such as garbage dumps and places where animals defecate. This demotivates people to use them. So, the location of shared toilets needed to be easily accessible, which will motivate the user to frequently use it, and also try to place far from the environmental nuisance area.

### *Ratio with Household Unit:*

While the question is about the easy access of shared facilities, the ratio of a toilet cubicle and household plays an important role in this. A cut-off figure of five households was suggested by the JMP Technical Taskforce as a possible threshold (UNICEF and WHO, 2010). The assumption is that management of a facility used by five or fewer households is likely to be easier as the households know each other through, for instance, co-housing. However, the same document reckons that there is no empirical evidence to suggest that five households are a better guarantee of safe use and management of toilet facility than four or six households; this ratio may vary from context to context.

### *Specific Coverage:*

The accessibility is also related to the variety of people who use the facilities. A small number of the same people repeatedly using household shared toilets, and a large number of different people who are rarely using more public facilities are different in nature, and their safety security concerns will also differ from others. Besides the number of users, there is also the issue of whom those users are, as sharing with people you know may secure the environment and enhance the access of women and child also. Generally, in a slum area, some neighbourhood household acts like a single community or a single 'family' living in several separate homes, and it is easy to share a single toilet for them rather than with a large number of people from several distant communities (Mazeau, A., 2014).

*Shared Sanitation and Special user Groups*

As mention before, while using shared toilets, some social-cultural factors also regulate the accessibility. The risks that exist for women and children of using shared facilities are acknowledged (Allen, et al., 2008), as well as the difficult access for the elderly and disabled (Cairncross & Valdamis, 2006). Access to such facilities at night is often mentioned as a critical point (Schouten & Mathenge, 2010). However, it's not the solution that shared sanitation has to be excluded. It just refers that shared sanitation has to be designed and managed according to the needs of special groups of users.

*Social Accessibility:*

The concept of Social accessibility in the shared toilet differs from context to context, but some common factors always remain the same, mainly social accessibility is seen through two main lenses: Gender and Children (Mazeau, A. et al (2013). Separate toilet blocks for Female users' needs to secure their privacy safety and security. Different contexts govern the use of communal facilities, and the different social norms may restrict movement, for example, in areas of northern Nigeria where men, children, unmarried girls, and post-menopausal women have greater freedom of movement than married women, who have to remain at home in seclusion (Robson, 2000), only venturing out occasionally after dark.

In recent years' socio-cultural aspects are considered as the more powerful catalyst for sanitation than health (Saywell and Cotton, 1998) and other issues. Schouw and Tjell (2003) derive socio-cultural acceptance through two aspects. One of them is the perception of the user, and the other is the behavior during the use of the facility.

Through this discussion, we find out some key indicators for accessing the physical and socio-spatial accessibility of shared toilets in slum areas.

III. METHODOLOGY

This study employs a case study research approach to examine the physical aspects of shared toilets in order to assess their current accessibility conditions. In recent years, the demand assessment procedure has grown in popularity as a method of estimating users' needs and opinions. This assessment method helps to understand the users' needs and desires (Parry-Jones 1999). Various methods are used to assess demand, depending on the researcher's interest and investigation. In this study, data is gathered through a variety of methods, including a questionnaire survey, an interview, a focus group discussion, observation, and photography. This research is mainly focused on qualitative data collected from stakeholders, while some quantitative data are also interconnected with this research. The research is primarily qualitative in nature. However, some quantitative analysis can also help to achieve a more realistic user perception. This mixed approach allows more people's views and participation in development and planning procedures.

*The Usefulness of a Mixed Approach*

- Quantitative methods such as large-scale surveys are not popular in development research (Mayoux 2006), but they

allow the researcher to demonstrate facts on a scientific basis, well understood by urban planners or engineers.

- Qualitative methods are regularly used to assess household behavior, including poor urban settings (Järvelä & Rinne-Koistinen 2005). Some of the tools used are derived from ethnology, such as participant observation (Denscombe, 2007), and often investigate the behaviour and social relations.

However, it is specified that both paradigms can be appropriate depending on the contexts (Chambers, 2008).

To assess the physical aspects of the shared toilets, it is important to evaluate the context and the perspectives of the stakeholders, the selection of case study area, is important for this research.

*Case Study Area Selection:*

According to the Census of slum areas and floating population 2014, there are approximately 1134 slums in Khulna City Corporation (BBS, B. (2015). These slums are not dispersed; rather, they are clustered; for example, the Rupsha slum area is made up of around 15 different slums, each with its own name. Among these 1134 slums, most of the slums have not enough sanitation facility; in this study, we will select several portions of two major slum areas, and one of those is three different roads in Rupsha slum, and the other is a single portion of Camp 1, Khalishpur. This research mainly analysis the physical accessibility factors of those slum area and try to find out their problems and suggest some strategical guidelines which will increase the Usage of shared toilets in slum area.

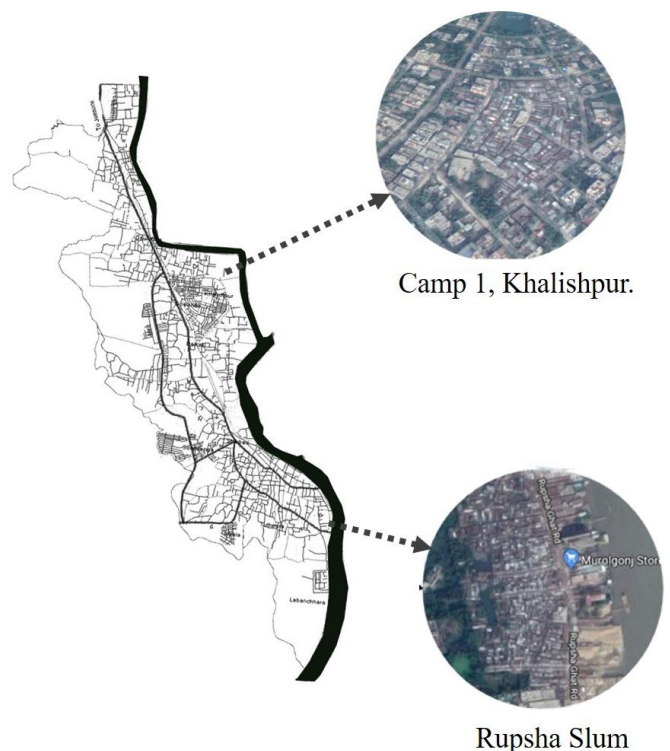


Fig. 1. Selected Slum location

*Camp 1, Khalishpur:*

JADE has provided community toilets in this slum. Most of the households in this camp had their own toilets, but due to a lack of sewerage facilities, they rejected those toilets, and now the majority of them use these shared toilets. There are approximately 500+ families living in this camp, with a total of 30 toilets. The physical condition of those toilet blocks is comparatively better, but equitable access facility is ignored here due to the toilet's location and another social fact.

*Rupsha Slum Area:*

These slums' toilets were installed around 20 years ago; these toilets are mostly pit toilets, and the toilet block's outlet is directly connected to the drainage system. The toilets are located far from the majority of the household, posing accessibility issues for women, children, and the elderly. Furthermore, due to the worst physical conditions, women and children have less frequent access. The number of users is fixed for every toilet block and the outsiders are strictly restricted here.

*Data Collections Techniques:*

Here the information is collected in two steps: a theoretical part based on a literature review of relevant theories and researches. Moreover, the second step is based on field survey, observation, mapping, transect walk, and interviews in the selected case area.

*Literature Survey:* Review of relevant works of literature to determine the key concepts and develop an understanding to prepare a set of key indicator which will help to carry out the field survey and analyse the data.

*Field Survey and Data collection:* An initial pilot survey of the shared toilet in slum area help setting up their selection criteria of case and samples; later the total research focused on their current conditions, mapping out their context observe their consequences. The semi-structured question, scoring the current situations and key person's interview helps this research to collect data from the field.

*Observation and Transect Walk:*

Observation is used as one of the vital techniques for understanding the context in the case study approach. To understand the context, its informal observation is necessary. Transect walks were mainly used to select the catchment area of the neighbourhood and done at the beginning of each fieldwork.

*Shared Toilets Surveys and Queues Observations:*

A pilot survey is conducted in a slum area with the help of local people. The queues were measured during morning and afternoon peak times on Friday and one of the other working days for all shared toilets to do the most representative observations.

*Mapping of Shared Toilets Block and Surroundings:*

The mapping represents the distribution of the sanitation facilities and the distance between toilet blocks and household units. This method allowed the participants to discuss together their different uses of sanitation facilities. This tool was also

used as a basis for the scoring of the facilities. Different groups of the user drew the spatial distribution of the sanitation facilities as their demand.

*Scoring the Existing Facilities:*

The users were scoring their toilets facilities according to the ratio of toilets block, location of the toilets units and the distance from their house unit, equitable accessibility issues, which provided a set of quantitative data to assess the situation and also help to find out the demand.

*Semi-structured Questioned Survey:*

The semi-structured interview was addressed to an individual and gathered some qualitative information on the condition of provided shared sanitation facility. Specific focuses were given to the ratio of toilets block, location of the toilets units and the distance from their house unit, accessibility issues like accessibility problems of women, children, and senior citizens.

*Analysis of Data:*

To analyse the data, we followed both content and built - environmental analysis method, which will help this research to find out a proper perspective about the case. Built-environment analysis is used here to understand the relationship between the spatial environments of the built-form and people's activity, behaviours (social actions and interactions). Moreover, the content analysis method has been adopted to analyze the qualitative data collected by both semi-structured interviews and open-ended questions at the questionnaires. In this study, qualitative data has been used to explore the expectation of shared toilet users, their needs, and problems. By systematically evaluating texts (e.g., documents, oral communication, and graphics), qualitative data can be converted into quantitative data. This study, however, focused on content analysis to get authentic information from participants. It helps to pictured people's perception on the physical aspects of shared toilets.

IV. FINDINGS AND ANALYSIS

From literature review we find a set of indicator to analysis the physical accessibility condition of shared toilet in slum area. This section provides only the findings from the interviews, regarding physical accessibility of shared toilet. Here we analyze the current situation and the peoples demand to enhance the access of shared toilets according to the indicator. Some Quotes from users are provided here to exemplify the issues raised from specific interviewees on specific factors.

*Location and the distance of shared toilets:*

*"It's a problem for us to use toilet those we live at the end of the slum, at morning we had to face a long queue and for the distance it hamper our frequent use of toilet, our girls and women suffer very much"*

*A responder, at Sofi Saheber Goli, Rupsha*

Initially the location and distance of shared toilets is a major factor which is directly influence the usage, suitable distance and location is needed to achieve the goal of frequent

access to toilet. When the distance between the toilet blocks and the house unit increases it's hampered the user's accessibility and reduce the willingness of frequent usage. Here the users feedback represents how location and distance affects their frequent toilet usage.in this part it represent the current scenario and users demand about the location of shared toilets, the feedback from the user of Rupsha Slum (2 different road) is showing here.

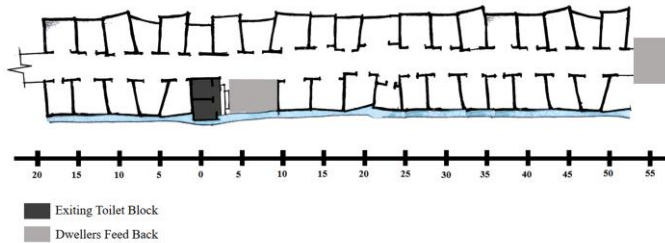


Fig. 2. Existing toilet location and dwellers feedback on toilet block, Hemayet mollar goli. Rupsa

From figure 2, it shows the existing toilet block in hemayet mollar goli at rupsas slum, this toilet blocks serve frequently its nearby 12-15 household but rest of the dwellers does not get proper facility due to the location, and that's why they choose separate toilet's position nearby their household. This figure marks the existing toilet block and users feedback in different colour, where it is clearly shows that, the households near the end of the road are selecting an abandon space for install a new toilet block here, thus they can frequently access the toilet.

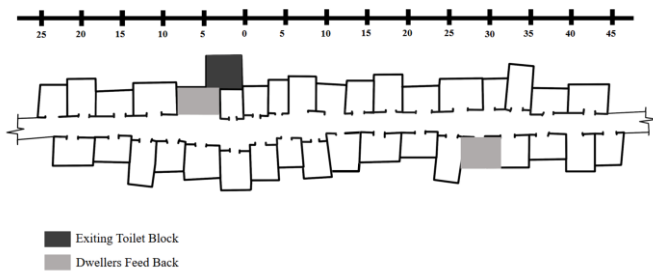


Fig. 3. Existing toilet location and dwellers feedback on toilet block, Sofi saheber goli. Rupsa

And from figure 3, it also shows existing toilet block at Sofi saheber goli at Rupsha slum, this toilet blocks also serve it's nearby 15 household very well, though due to the location, it's difficult for age old user to use frequently, but rest of the dwellers does not get proper facility due to the location, and that's why they choose separate toilet's position nearby their household. They are interested to compromise space for toilet blocks nearby their household. They located a new space for their toilet block which is indicated in the figure.

Figure 4 shows the existing location of toilets in camp 01 khalispur, though the physical conditions of toilet block is better than others but due to the location this toilet is less accessible to most of the user.

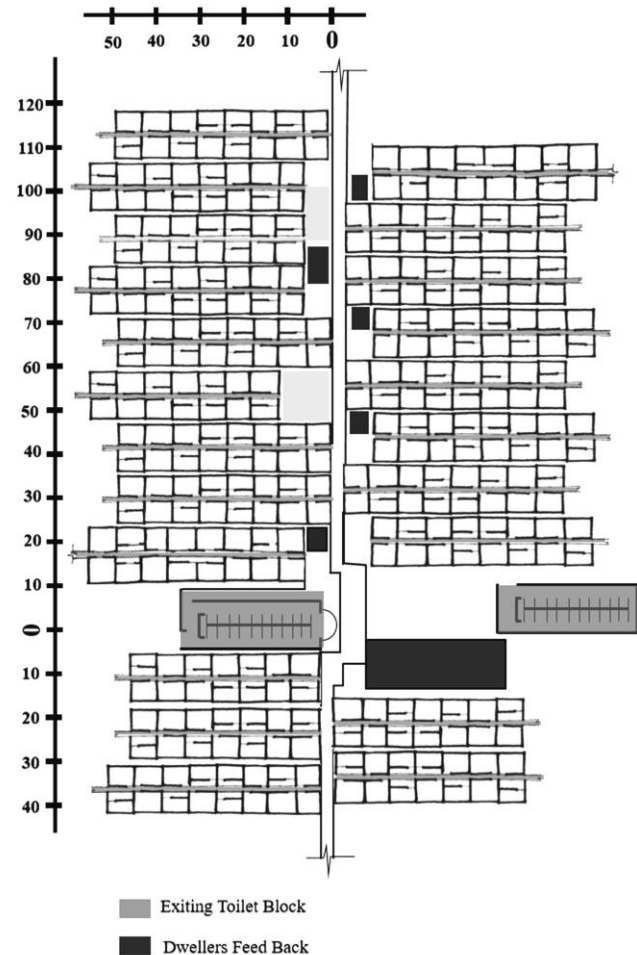


Fig. 4. Existing toilet location and dwellers feedback on toilet block, Camp 1

A large number of household has a distance of 100-150 m from the toilet block, which restricted the frequent access of the user , and that's why its reduce the usage of this toilet, and for women its quite impossible to use these toilets at night due to this long distance and for security reason also. When the dwellers gave feedback on the toilet location, most of them has chooses their toilet location within 20-25 m far from their house, whom they can frequently use.

TABLE 1. User feedback on the distance shared toilet

Distance (from House hold to toilet block )	Users feedback on the suitable distance for toilet block	
	Rupsha Slum (out of 25)	Camp 1(out of 25)
15 m	12	10
25 m	10	8
50 m	3	7
100 m	0	0

Here this table represent the user's opinion about the distance of shared toilet from their household. Total 50 interviewee form these two slum share their opinion on it.

This feedback shows that from the users perspective, around 44% of user demand their toilet block within 15 meter, while 36% has no problem with in 25 meter and rest of the 20% has no obligation about 50 meter distance.

**Accessibilities Issues:**

Based on the survey, the majority of shared toilet blocks do not have separate toilet units for women and children, and they all overlook the accessibility of elderly people. While there are separate toilet blocks for men, women, and children in Camp 1 Khalishpur, due to infrastructure issues, the accessibility of the elderly is also neglected. Ensure equitable access for all in sanitation is an important indicators of improved sanitation.

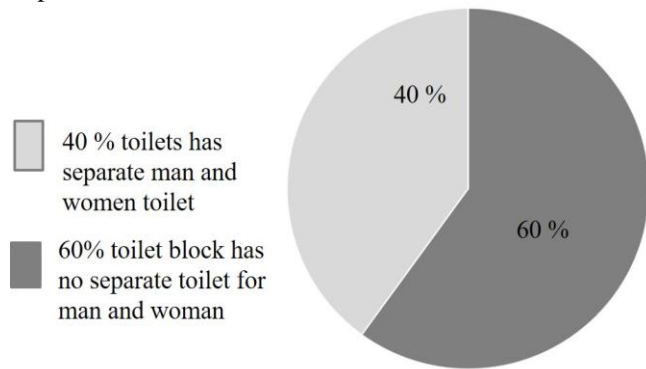


Fig. 5. Accessibility Ratio, Rupsha Slum.

Only two of the five shared toilet blocks in the Rupsha slum area have separate men's and women's toilets, and one toilet block has hand rails, allowing the elderly and children to use the toilet safely. Figure 5 depicts the survey results.

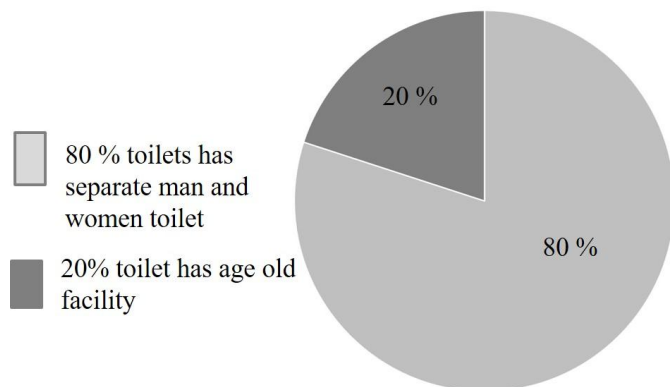


Fig. 6. Accessibility Ratio, Camp 1.

Figure 6 shows the percentage of separate toilet blocks for men and women in Camp 1, khalishpur. To serve the occupants, two large shared toilet blocks with separate male, female, and children latrines have been installed.

However, due to distance and infrastructural difficulties, it is inaccessible to the elderly people.

**Ratio Of toilets Block and House-unit:**

The ratio of toilets and household units has an impact on equitable access to shared facilities. While a large number of people used shared toilets, it could not provide adequate support to the community. It creates unhygienic conditions, takes long waiting times in que, hampers the physical conditions and also hampered the safety and security issues. Here the dwellers preferable ratio of shared toilet and household unit is given below.

TABLE 2. Scoring the ratio of shared toilets and household unit, Rupsa slum

Ratio of toilets cubicles and family- .Rupsha Slum Area. Total responds : 25	Users satisfaction scoring (4-0)				
	4 (Very good)	3 (Good)	2 (Normal)	1 (Bad)	0 (Very bad)
5 family per toilets	12	10	03	0	0
8 family per toilets	10	10	05	0	0
12 family per toilets	5	08	12	0	0
20 family per toilets	0	0	08	15	02

According to statistics from the Rupsha slum area, users prefer toilet blocks with 5-10 families per cubicle.

TABLE 3. Scoring the ratio of shared toilets and household unit, Camp 1

Ratio with toilets cubicles and family - Camp 01 Total respond 25	Users satisfaction scoring (4-0)				
	4 (Very good)	3 (Good)	2 (Normal)	1 (Bad)	0 (Very bad)
5 family per toilets	05	10	10	0	0
8 family per toilets	8	10	07	0	0
12 family per toilets	12	09	04	0	0
20 family per toilets	0	4	08	11	02

Although the statistics for Camp 01, Khalishpur indicate that they prefer 8-12 families per toilet.

Based on the scoring of the user in those slum areas, the preferred ratio of the shared toilet and household is between 5 and 12 households per toilet. However, it is also shown that the toilet block ratio varies depending on the context.

**Queuing Duration at the Shared Toilets**

*“Most of the women finish their bathroom work early in the morning because when the men and children wake up, it creates a long queue, and most of the men smoke while they are in the toilet, which smells very bad and makes it difficult to use the toilet at this time. We did not have separate toilets for men, women, and children, which caused a problem for us. Most of the time, children under the age of 5-6 years completed their toilet beside the local drain”*

A Female responder, from, Rupsha Slum

Long queues discourage frequent use of shared facilities. A queuing observation is performed to determine the length of the queue and the number of people in front of the toilet cubicles at peak times. This observation began at 6 a.m. in the morning to determine the busiest hour in the morning, and the number of users queuing in front of each facility was counted every 30 minutes. Toilet queues were observed in four different shared toilets in the slum area. The findings show that during peak hours, toilets were mostly used by men and women, with children accounting for less than 20% of users. . Number of queuing is depends on the number of total toilet cubicles and the ratio of toilet users.

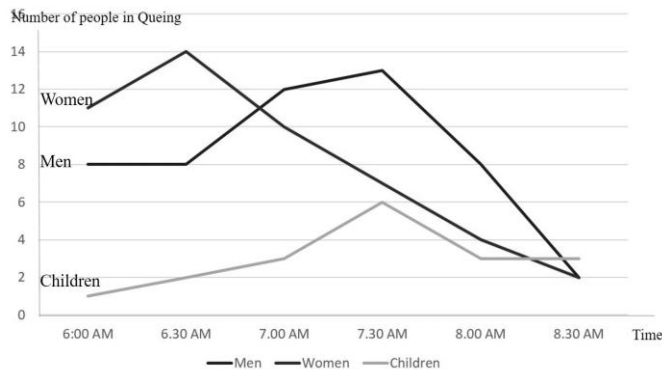


Fig. 7. Number of Users Queuing at morning Peak time in Hemayet Mollar Goli, Rupsa.

Figure 7, depicts the queuing scenario of Hemayet molar goli (Rupsa slum Area), with the number of people queuing at various times ranging from 6.00 am to 8.00 am. The number of men, women, and children queuing is indicated by different color coding. Both men and women face a long queue in the morning; most women finished their toilet work between 6 and 7 a.m., while the men face the longest line between 7 and 8 a.m.

Figure 8, represents the queuing scenario of Camp 1, with the number of people queuing at various times ranging from 6.00 a.m. to 8.00 a.m. The number of men, women, and children queuing is indicated by different colour coding.

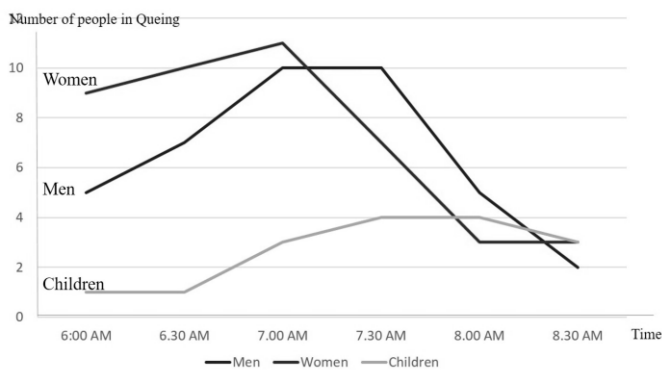


Fig. 8. Number of Users Queuing at morning Peak time in Camp 1, Khalishpur.

### Safety and Security

To ensure equitable and adequate access to shared toilet, safety and security measure is important. Security for women and children using shared toilets is a major concern in slum areas; observations show that most shared toilets lack lighting, discouraging women from using the toilet at night. Sometimes women do not feel safe and bring someone else with them to the toilet at night for security reasons. Insecurity and discomfort are sometimes caused by the location of a shared toilet. Because the majority of the shared toilets are located beside the road and at the end of the slum, it is inconvenient for teenage or middle-aged women to use the shared toilet beside the road. During menstruation, women need to change and dump napkins, and most toilets do not have a facility to

dump napkins, so women must dump them secretly and it also hamper the security.



Fig. 9. People’s feedback on safety and security

Figure 9 shows that the majority of shared toilet dwellers reported that lighting is one of the major security issues, that approximately 40% of women state that the location of the shared toilet is responsible for their insecurity and discomfort, and that menstrual safety is also identified as a safety issue by the women, which is a barrier to equitable access to shared facilities.

### Findings:

- The satisfaction and rate of use of shared toilets is primarily determined by their location and distance. The majority of survey respondents agree that the appropriate distance between toilet blocks and households is 25-30 meters, whereas their toilets are currently located 40-50 meters away from the house. In this study, it was discovered that respondents whose homes are close to the toilets are more satisfied with their facilities than others.
- Because land scarcity is the main barrier to finding a suitable location and ensuring a preferable ratio between households, when providers are constructing a shared sanitation system in a slum, they must consult with the residents to find a suitable land. Participation of users can lead to more appropriate sanitation solutions for respective slums.
- The ratio of shared toilets block and household units also has a significant impact on usage; the majority of respondents agree with the ratio of 5 to 8 households per toilets block. The majority of shared toilets had a peak time of queuing in the early morning, which could take up to 20 minutes. The queuing time for toilets will be reduced if the number of toilet cubicles is increased in comparison to the household.
- Equitable accessibilities for men and women is also important to achieve the improved sanitation, it 'needed to design separate toilets for men, women and children. For senior citizen they have to provide facilities on toilet accessibilities. Universal accessibility is completely ignored here; however, when designing a toilet, it will keep universal accessibility in mind.
- The majority of the shared toilets lack sufficient lighting. The lack of lighting facilities reduces usage, and it is

impossible for women to use the toilet at night due to safety and security concerns. A well-lit facility can increase security while also enhancing usability.

#### V. PHYSICAL ACCESSIBILITY GUIDELINES FOR THE SHARED TOILET TO ENHANCE THE USAGE

Based on the previously reported findings, the following Physical Accessibility priorities can be formed:

##### •*Locations and Distance:*

When constructing a shared toilet, the best location is one which is connected to the drainage system and can easily accommodate a large number of people. According to the results of the study, the ideal distance between toilets and households is 15-25 meters. When planning to build a shared toilet in a slum, keep this in mind and try to keep the distance between the hose hold and the toilets not more than 25 meters. Since distance has a significant influence on usage. If the toilet blocks are located near a road, at the end of the slum, or near a damp yard, it creates security issues. Instead, try to install shared toilets near the center of the slum or a place surrounded by households, which ensures the user, most of the time the female user, feels safe.

##### •*Participation With Stake Holders To Find Out A Suitable Land:*

Ensure community participation in determining a suitable location; in selecting the most suitable option, providers must consult and negotiate with stakeholders, as well as work with a participatory approach while installing and managing the entire system. The provider/implementation authority can relocate the existing shared toilet blocks if the community people agree.

##### •*Equitable Accessibility:*

Equitable access can boost the use of shared toilets; however, separate toilet blocks for men and women are required to ensure frequent access of female users to shared toilets. Safety issue is one of the major social issues, most of the time women's are the main victim of it. Separate toilets blocks for women can alleviate these issues. During the menstrual period, it is necessary for a woman to change the sanitary pad on a regular basis and dispose of them, but in our context, this is quite difficult for them to dispose it easily. Therefore, when designing a toilet cubicles for women, it is necessary to design sanitary napkin disposal facilities and provide adequate space for them.

##### •*Considerations For Children And Elderly:*

When designing a toilet, keep in mind the children's scale and keep a block for children. If at all possible, try to provide additional facilities at the women's toilet, where children under the age of five can easily use it, and install a door that can be opened from both inside and outside, as well as design the stair steps to their scale.

To ensure the frequent usage of elderly users, it is necessary to install a railed in the toilet from which they can get support. Whenever possible, try to design universal accessibility / ramp facilities and provide comfortable space

for them. Though there is a scarcity of land in the slum area, if it is not possible to design a ramp for them, then design the riser of the stair not more than 4".

##### •*Ratio of Toilet Blocks and Household:*

According to the survey, the lack of toilet blocks in relation to the household is to responsible for the lack of hygienic conditions, long queues, and reduced frequent usage. The maximum number of toilets blocked can ensure maximum usage. When creating a toilet block receive community feedback before deciding on the number of toilet cubicles. According to JMP, 5 households per toilet cubicle is the most hygienic solution. Though the slum area is a compromising area, it is necessary to fix the ratio based on demand, but the provider must try to keep the ratio between 5-8 households per cubicle.

##### •*Security and Surveillance:*

Based on the findings, security issues also reduce usage, most of the shared toilet has lack of proper lighting facility, so it is necessary to provide lighting both inside and outside of the toilet. If an electrical connection is not available, consider installing a solar panel to provide lighting.

#### VI. CONCLUSION

Based on the findings discussed above, it is clear that the government and non-governmental organizations (NGOs) are taking various steps to achieve 100 percent sanitation coverage in the slum area. As a result, they provide various types of shared facilities in slum areas, increasing sanitation coverage. In addition, the shared toilet serves as the most efficient sanitation solution for slum dwellers, ensuring the goal of 100% sanitation coverage. Though many initiatives were initiated to improve adequate sanitation access for all in the slum area, none of these have been able to meet the users' demand for frequent use of the sanitation facilities. Most of the time, shared facilities are provided from the top down, with no regard for user participation or demands. It is necessary to consider the onsite users' demand and constraints in order to enhance the use of shared toilets and ensure equitable access for all. This study discovered some physical accessibility factors that have a significant impact on the use of shared toilets. The location and distance of the shared facility regulates frequent access, while for women and young girls, distance and security factors reduce their frequent toilet use.

Due to the lack of universal accessibility, the vulnerable community (the elderly, mentally disabled, and children) are discouraged from using the shared facility. The ratio of shared toilets to household units also influences usage; this study shows that a large number of households compared to a toilet block limit their use of it Proper toilet layout will ensure that all people have access to shared toilets, and lighting and ventilation will also enable women to use them more. As a result, it's important to think about site-specific toilet block design and ensure people's involvement and input. Finding appropriate locations for shared toilets is a major constraint, which can be overcome with active stakeholder involvement.



We believe that if a shared toilet is designed with physical accessibility in mind, it would be more user-friendly, allowing for more frequent use by all.

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