URBAN SCHOOL SANITATION

Understanding urban school sanitation, the factors which influence one’s decision to use a toilet and simple solutions for how to improve it
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For Arghyam

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Reap Benefit Foundation

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1 Executive Summary

There is limited data on urban school sanitation, and there is a need for a tool for school administrators to use to evaluate the sanitation system objectively. It is important to understand the needs of students, as without the needs being met, it is easy for them to avoid using the toilet at school, leading to health complications, or unhygienic habits for the rest of their lives.

When students from 20 schools gave their schools an average score of 2 (poor), it was heartening to know that they felt that simple solutions discussed to answer their non-negotiable needs (facilities/features without which they would not use the toilet) would improve the scores of the toilets to 4 (good).

This research project uses a mind map with cue cards to understand the impact of every element with which the student interacts with while using the sanitation facility and attempts to identify their influence on the student.

2 Common abbreviations

- SSHE – School Sanitation and Health Education program, under the Total Sanitation Campaign
- NSSI – National School Sanitation Initiative
- SSA – Sarva Shiksha Abhiyan
- CBSE – Central Board of Secondary Education
- IS – Indian Standard
- RMSA – Rashtriya Madhyama Shiksha Abhiyan
- SDMC – School Development Management Committee
- BEO – Block Education Officer
- O&M – Operations and Management
- IEC – Integrated Education Curriculum
3 Acknowledgements

This project has addressed a basic need felt by students in both private and government schools - basic usable sanitation. It is a very fundamental need, which almost 50% of the students don’t claim to use. The reasons for not availing facility are poor maintenance. To help the school administrators understand the different elements which might discourage students from using the toilet facility, we have undertaken this project.

We’d like to thank the team at Arghyam- Uzra Sultana, Kavita Nath, Neelima Thota for their support and guidance during this project. Uzra Sultana has been instrumental in finalizing the layout, processing images and presenting data well.

We would like to thank all the school authorities, teachers and students for taking time off to be part of this research project.

We’d like to thank Vineetha Chettri of Azim Premji University for being part of this effort. Her unflinching focus on finding data and skills in calculations have helped us immensely. Our gratitude goes out to Ritwik Ballal for taking time off to translate for Vineetha in the government schools.

We’d also like to thank the student-interns from St Joseph's college – Tanvi Sinha, Shruthi Shine and Athmica Shetty for collecting data on our behalf.

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Kuldeep Dantewadia
Bangalore
2014
4 Introduction

Sanitation is defined as the safe management of human excreta, including its safe confinement, treatment, disposal and associated hygiene-related practices. The NSSI\(^1\) extends the boundaries of sanitation to cover personal hygiene, safe water, human excreta disposal, waste water disposal, solid waste disposal, food hygiene and environmental sanitation (in and around the school).

4.1 Why this project?

When it came to light that the majority of students in schools, both private and government avoided using toilets at school, this project was conceptualized to understand reasons for this. While many reasons for this emerged, one common reason was toilets in poor condition. When literature review was conducted on urban school sanitation to verify the poor use of sanitation facilities in urban schools, it was discovered that there was extensive documentation for rural schools and limited documentation for urban schools. Unlike the data from rural India, health and school attendance was affected by sanitary habits, but the impact was largely invisible due to the midday meal scheme in government schools and attendance cutoff in private schools.

The NSSI’s nationwide school rating for about 2,450 schools is represented below – once as a pie chart indicating the scale of poor urban school sanitation and once as a bar graph, showing state wise data, where red indicates the grim conditions, needing immediate attention.

Figure 1 Breakup of NSSI school sanitation across India

\(^1\) National School Sanitation Initiative
In a bid to identify the reasons or elements which discouraged toilet usage, this project came into being. Sanitation as prescribed by the regulatory bodies was reviewed, and the main objectives of the project were stated as follows:

- Understand school sanitation from design perspective
- Understand school sanitation from logistics/numbers perspective
  - Understand ground realities
    - Design and facilities
    - Usability (O&M, Innovations)
    - Solutions
- How to improve the existing systems
- Projected impact of such improvements
- Contextualizing the findings

4.2 Need for good sanitation in schools

The need for good sanitation could be viewed from school level and at the city level. The city level view considered the impact of sanitation on a city, incorporating the habits and behavior patterns developed at home and school. The school level view only looked at the impact of sanitation on direct functions of schools like education.

The impact for good sanitation could be summarized as below:

- Better health – with better water and sanitation, the user’s health improved. Conditions like diarrhea, urinary tract infections, stretched kidney could be avoided
- Monetary benefits –
  - With good health, one’s expenditure on medical services and medicines reduced, reducing the total number of non-productive/learning days in one’s life.
  - With better maintenance of the sanitation and water facilities at home/school level, the overall cost-burden on the city level infrastructure was reduced.
- Greater productivity - with good sanitation, one was able to relieve oneself as and when needed, increasing the ability to focus and be productive.

4.2.1 School level need for sanitation

According to WASH, which viewed sanitation from an individual’s perspective:

- 88% of diarrhoeal disease was caused by unsafe water supply, and inadequate sanitation and hygiene (WHO, 2004)
- Children’s ability to learn could be affected by inadequate water, sanitation and hygiene conditions in several ways. These included helminthic infections (which affected hundreds of millions of school-age children), long-term exposure to chemical contaminants in water (e.g. lead and arsenic), diarrhoeal diseases and malaria infections, all of which forced many schoolchildren to be absent from school.
- Girls and boys were likely to be affected in different ways by inadequate water, sanitation and hygiene conditions in schools, and this could contribute to unequal learning opportunities. Sometimes, girls and female teachers were more affected than boys because the lack of sanitary facilities meant that they could not attend school during menstruation.

SSHE’s situational analysis indicated that the high expectations of school health and hygiene education programmes had not always been fulfilled. Schools were not safe for children due to
neglect of the operation and maintenance of facilities. In addition to this, hygiene education given to children had not always been relevant or effective. Schools frequently suffered from:

- Non-existent or insufficient water supply, sanitation and hand-washing facilities
- Toilets or latrines that are not adapted to the needs of children, in particular, girls
- Broken, dirty and unsafe water supply, sanitation and hand washing facilities
- Unhealthy and dirty classrooms and school compounds
- Children with poor hand washing habits and practices

An independent study by Pratham in 2012 found that only 54% of the schools had usable/functional girl's toilets.

Good habits formed in schools and childhood influences the habits of the citizens, impacting the city.

### 4.2.2 City level need for sanitation

Observations of urban Class 1 cities (with a population of over 1,00,000 residents) led to the following data, based on which the Ministry of Urban Development introduced the National Urban Sanitation Policy in 2008 -

- None of 423 Class 1 cities were “Healthy and Clean”
- Every two out of five cities “need immediate remedial action” in terms of sanitation facilities and were rated in the “red” category
- More than half needed “considerable improvement” and fall in the black category
- This study also found the following issues in the policies that existed at that time:
  - Poor Awareness - Sanitation had been accorded low priority and there was poor awareness about its inherent linkages with public health.
  - Fragmented Institutional Roles and Responsibilities - There were considerable gaps and overlaps in institutional roles and responsibilities at the national, state, and city levels.
  - Lack of an Integrated City-wide Approach - Sanitation investments were currently planned in a piece-meal manner and did not take into account the full cycle of safe confinement, treatment and safe disposal.
  - Limited Technology Choices - Technologies had been focused on limited options which were not cost-effective, and sustainability of investments had also been in question.
  - Reaching the Un-served and Poor - Urban poor communities as well other residents of informal settlements had been handicapped in obtaining affordable access to safe sanitation due to lack of space or economic constraints
  - Lack of Demand Responsiveness - Sanitation had been provided by public agencies in a supply-driven manner, with little regard for demands and preferences of households as customers of sanitation services.

### 4.3 Difference in sanitation facilities between government and private schools

There was a noticeable difference in the design and maintenance of toilets in government and private schools. Government school toilets looked to ensure the basic availability of sanitation facilities, whereas the private schools attempted to provide better facilities. The following table explains the differences in greater detail.
<table>
<thead>
<tr>
<th>Basic Infrastructure – toilets and access to water inside toilets</th>
<th>Government school</th>
<th>Private school</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td>Poor natural ventilation, lighting and artificial lighting. Toilets typically outside the school building, and the hand wash is further away. New designs incorporate hand wash inside the toilet complex.</td>
<td>Toilets usually available on each floor of the school building, with good natural lighting and ventilation. Artificial light is provisioned. Handwash facilities are inside the toilet complex.</td>
</tr>
<tr>
<td>Access to water</td>
<td>Usually have limited access to water, as most depend on government water supply. Amount of water stored typically amounts to less than 20 litres of water per student, ensuring that the school often runs out of water. Scope to expand storage is poor, the need to do so is often not visible to the management. Buckets and mugs are usually not replaced post damage.</td>
<td>With access to water, either through water tankers, or bore wells, these schools ensure that students have greater access to water. Buckets and mugs are replaced more quickly when damaged than at government schools</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Poor</td>
<td>Better</td>
</tr>
<tr>
<td>Expenses budgeted for Use of grant for maintenance of toilets</td>
<td>The government schools have a limited budget available for the maintenance of toilets – usually given as part of the overall school maintenance program. The maximum grant any school can get is Rs 20,000 per annum and was to be used for multiple uses. Refer to footnote 3 for more details.</td>
<td>Private schools have a much higher budget, typically allocated only for toilet maintenance. In some cases, the amount went all the way up to Rs 40,000 on consumables (Harpic, Soaps etc) alone each year.</td>
</tr>
</tbody>
</table>

Table 1 Difference in sanitation facilities between government and private schools

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3 For protection of school building and maintenance of the school like whitewashing, minor repair works, preparation of teaching-learning equipment, payment of electricity and telephone bills, provision of drinking water facility, maintenance of toilets and cleanliness of school and its campus. If there is savings after implementing the above activities, the amount may be used for installation of incinerators and purchase of sanitary napkins for girl students studying in Higher Primary Schools.
4.4 Research Flow and Methodology

The research followed this flow:

![Flow diagram showing ID, Evaluate, and Implement stages with tasks]

4.4.1 Overview of the Stages:

4.4.1.1 Identification of Schools

Appropriate schools were identified to represent diversities in the following:

- Type of Management - Private and Government (the initial hypothesis was that the private school toilets would rate better than the public school toilets due to greater access to funds, resources and training levels)
- Type of Students⁴ - Based on Socio-Economic backgrounds

<table>
<thead>
<tr>
<th></th>
<th>Private</th>
<th>Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Socio Economic Strata</td>
<td>PS1, PS4, PS5, PS10</td>
<td>GS1, GS3, GS5, GS6, GS8, GS10</td>
</tr>
<tr>
<td>Middle Socio Economic Strata</td>
<td>PS2, PS3, PS7, PS8, PS9</td>
<td>GS2, GS4, GS7, GS9</td>
</tr>
<tr>
<td>Upper Socio Economic Strata</td>
<td>PS6</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table 2 Breakup of schools based on management and socio-economic strata catered to

⁴ Though we had initially envisaged a difference between co-ed and gender specific schools, we found no difference in the maintenance between them. Hence, this differentiation was removed.
An effort was made to ensure geographical spread, to attempt a fair representation of the city. The below map indicates the locations of the sample schools with the private schools being colored in red and government schools being colored in blue.

Figure 4 Graphical representation of the sample schools

4.4.1.2 Evaluate
The evaluation of the sanitation facilities happened through 2 perspectives:

- Design/Standards based
- Usage data based

4.4.1.2.1 Design/Standards based evaluation
Using the data collected through designs proposed by different organisations like SSHE, SSA, Wash etc, a comprehensive set of parameters covering design, operations and management, and simple value –addition the school could take up were identified. The researchers visited all the toilets to see if these parameters were met. In some cases, there were some deviances. In all cases, attempts were made to identify the engineer who designed it and understand the reasons.

4.4.1.2.2 Usage data based evaluation
This evaluation strategy viewed the usability of the sanitation facility. Sanitation is a sensitive topic, and discussing it had been made a matter of shame in some sections of society. Hence some tools that were creative and fun but at the same time reliable were adapted for our needs and chosen. To ensure some degree of comfort, we opted for collecting data from groups of students or teachers instead of talking to individuals. This approach also allowed us to have a greater number of responses.

4.4.1.2.3 Tools used
3 tools were used to collect data for this project:
4.4.1.2.3.1 Questionnaire
A questionnaire was created to help the researcher – this was a mix between a questionnaire and a checklist. This questionnaire had 3 parts – for the administrator, the teacher and the students. Questions were prioritized accordingly.

4.4.1.2.3.2 Mind Mapping with cue cards
A mind map is a tool used to connect a central topic to all the factors influencing it. This tool was modified to include cue-cards – a set of cards meant to help remember, or in this case, be cognizant of the different factors affecting one’s use or disuse of sanitation facilities. With an intention to make the primary respondents, the students, feel at ease, a mind map with cue cards was used to collect the data.

Each cue card contained one element, designed to be categorized under four large groups mentioned below. Each element had an opposite value, so that it was easy to represent the exact condition of the sanitation facility. To make internal categorization easy, the cards had either a happy smiley or a sad smiley to indicate which of the opposites were picked. The students didn’t understand this design element and were not influenced by it.

Being a visual tool, the placement of the cards in order of importance resulted in in-depth discussions on the prioritization of any element over the others. It resulted in valuable qualitative discussions, making data collection with small groups (of less than 6 members⁵) more accurate.

4.4.1.2.3.3 Cards and their groups
The cue cards representing various elements in a sanitation system were developed internally and further expanded on with the feedback from teachers and students. Based on the type they were then categorized into these groups, based on the decision points the user took to evaluate the usability of the facility.

4.4.1.2.3.4 Look – Green colour code
Visual elements on the usability of the toilets decide if the user used the toilet or not. These elements were evaluated and identified by simple observation of the facility. This list had the most elements. Ex – “Is the toilet clean?”, “Is there privacy?”. Each element was created with an opposite, for example, “Urine and poop smell” and “No urine and poop smell”.

![dirty/wet cubicle](image1.png) ![no graffiti](image2.png)

This set of cards contains these elements

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⁵ Any number larger than this created a lot of confusion in the groups. This was determined after experimenting with different number of respondents in the group.
<table>
<thead>
<tr>
<th>Natural light</th>
<th>Sufficient lighting is a design requirement, meaning that it will allow sunlight to dry the floor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bucket in toilet</td>
<td>A basic necessity to allow access to water</td>
</tr>
<tr>
<td>Good / clean buckets</td>
<td>Clean buckets encouraged greater toilet use as compared to dirty buckets</td>
</tr>
<tr>
<td>Basic Infra - Mug in toilet</td>
<td>A basic necessity to allow access to water</td>
</tr>
<tr>
<td>Quality of mugs</td>
<td>Clean mugs encouraged greater toilet use as compared to dirty mugs</td>
</tr>
<tr>
<td>Sufficiency of toilets</td>
<td>A design parameter, this was judged by the existence of long queues for toilets</td>
</tr>
<tr>
<td>Common Dustbins</td>
<td>Basic necessity to dispose of dry waste, it indicated a well thought out toilet</td>
</tr>
<tr>
<td>Hanger/Bag hook</td>
<td>A basic design requirement, this allowed students to hang uniforms, bags, or newspapers for wrapping sanitary pads (for girls)</td>
</tr>
<tr>
<td>Gap between wall and door frame</td>
<td>Noticed specifically with plastic doors, the frame often had a gap between itself and the wall, affecting privacy</td>
</tr>
<tr>
<td>Cubicle dustbin</td>
<td>Girls preferred this over common dustbins as it didn’t embarrass them when they had to dispose of their used sanitary pads. This is a basic design requirement.</td>
</tr>
<tr>
<td>Insects and rodents in the toilet</td>
<td>This indicated insufficient / poor maintenance, allowing insects and rodents into sanitation facilities, affecting the usage of them</td>
</tr>
<tr>
<td>Passage -wet</td>
<td>As this was one of the first things students viewed in a sanitation facility, wet passages discouraged usage.</td>
</tr>
<tr>
<td>Non leaking roof</td>
<td>A O&amp;M indicator, this was commonly seen in government schools, discouraging toilet use seasonally</td>
</tr>
<tr>
<td>Wet dirty cubicle</td>
<td>A design and O&amp;M indicator, students found wet and dirty cubicles (grime or mud on the floor due to wet floors) discouraging</td>
</tr>
<tr>
<td>Broken unusable toilet</td>
<td>As shown in the cover picture, these toilets counted towards</td>
</tr>
<tr>
<td>Soiled toilet</td>
<td>With the Indian or western commode itself soiled, students found using them extremely discouraging</td>
</tr>
<tr>
<td>Dysfunctional doors</td>
<td>Doors which can’t be shut due to excess wood, poor latches, or with plastic doors which the hinges had given way</td>
</tr>
<tr>
<td>Dysfunctional latches</td>
<td>where due to rust the latch was jammed</td>
</tr>
<tr>
<td>Issue</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Soiled cubicle</td>
<td>Seen often in the boys toilet as urine all around the water closet, or seen as pads and blood stains in the girls cubicle, this discouraged students from using the toilet</td>
</tr>
<tr>
<td>No sanitary pad wrapping paper</td>
<td>While schools said that there was paper available in the staff room to wrap pads, many girls felt embarrassed to go and ask for the paper as everyone would know about it</td>
</tr>
<tr>
<td>Clogged sink drains</td>
<td>Usually with long cement sinks attached to the wall, the drains were jammed, discouraging students from washing their hands, or to just rinse the hands in an unhygienic manner</td>
</tr>
<tr>
<td>Queue</td>
<td>Long queues discouraged students from even trying to use the toilets</td>
</tr>
<tr>
<td>Peek proof windows/ventilator</td>
<td>In the case of PS1 or GS7, the ventilator design was inappropriate, removing the sense of privacy to the user</td>
</tr>
<tr>
<td>Clogged WC</td>
<td>This evaluated if the water closets kept getting clogged often. True for girls’ toilets where often pads were flushed into it.</td>
</tr>
<tr>
<td>Soap - hand wash</td>
<td>Soap for hand wash to ensure cleanliness</td>
</tr>
<tr>
<td>Water quality</td>
<td>When tanks were not cleaned periodically, there was some smell and discolouration in the water</td>
</tr>
<tr>
<td>Main door shuts</td>
<td>In cases where the toilet design</td>
</tr>
<tr>
<td>Working lights</td>
<td>Light fitments were broken or removed, while the wires had electricity flowing through them</td>
</tr>
<tr>
<td>No hand wash</td>
<td>Again seen in old toilets, and some new toilet structures, sinks and taps have been swapped for tanks and a small mug, which becomes unusable when the mug is removed</td>
</tr>
<tr>
<td>Toilet inside school building</td>
<td>When toilets were located outside, students avoided using the toilets when it was raining. Hence having toilets inside the building is very convenient</td>
</tr>
<tr>
<td>No water - sink taps</td>
<td>A card to evaluate access to water</td>
</tr>
<tr>
<td>No doors - broken/not installed</td>
<td>Seen more in government schools, wooden doors had come of their hinge, or not installed at all</td>
</tr>
<tr>
<td>No latch on doors - broken/not installed</td>
<td>Seen commonly with government schools where the latches were broken off or with plastic doors where the hinge had been pulled off, this meant that the user had to always go with a friend, making it very inconvenient</td>
</tr>
<tr>
<td>Graffiti</td>
<td>Students found obscene graffiti or scary graffiti discouraging to using the toilet</td>
</tr>
</tbody>
</table>
Dysfunctional hand wash sink

Used to evaluate if the students felt that the sink pipe was jammed with food, debris etc, and hence dysfunctional.

No water for wash in cubicle

Insufficient water, resulting in soiled cubicles, stench of urine and poop.

Adequacy of artificial lighting

In the example of GS3, the whole toilet was served by 1 tubelight in one corner. This card evaluated if the students felt there was enough lights. Being children, many complained about getting scared in the dark, and hence avoiding the toilet.

Functional flush

In some schools, flushes were installed, but dysfunctional.

Functional switches

In many cases, we found that the light switches were broken, or disconnected.

Proximal hand wash to toilets

In some government schools, the handwash was quite far from the toilet, and away from the path to the class, incentivering students to not wash their hands.

No educational posters

Students wanted posters on how to use the toilet, wash hands, wrap pads etc.

---

Table 3 - Elements measured by the visual cue cards

4.4.1.2.3.5 Feel – Yellow colour code

The next decision point according to the students was the feel of the toilet. It included elements like cramped cubicle, dampness and mustiness, a sense of privacy etc, which were evaluated when the user entered the toilet for the first time.

<table>
<thead>
<tr>
<th>Privacy</th>
<th>Toilet designs need to encourage a sense of privacy in the user. This card judged the presence of this feeling at a macro level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dampness and mustiness</td>
<td>This element indicated the efficiency of the design of the toilet. It judged the presence or absence of dampness and mustiness which resulted in fungus on the walls</td>
</tr>
<tr>
<td>Cubicle space</td>
<td>The layout of the cubicle can make it feel cramped or spacious. This card judged the efficiency of the layout based on what the students felt.</td>
</tr>
</tbody>
</table>
**Table 4 Elements measured by the feel cue cards**

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common area space</td>
<td>This refers to the passage space. With no guidelines on this, we saw a great variation in designs. This card judged the space allocated according to the students and how important it was for them.</td>
</tr>
<tr>
<td>Stuffiness</td>
<td>A function of design, this card judged if the ventilation was sufficient or not.</td>
</tr>
<tr>
<td>Dampness (wet floors etc)</td>
<td>Another function of design, this card judged if the students felt dampness due to standing water on the floor. It also indicated leaking taps or fitments which kept the floor wet at all times. This was indicated as important to the students during the pilot.</td>
</tr>
<tr>
<td>Safety from theft</td>
<td>This element was a result of student feedback that if lockers were used in the toilets, or in some cases, bags were taken, there were thefts. Though it was an element more suitable to private schools, we added this into the card set to see its need across schools.</td>
</tr>
</tbody>
</table>

**4.4.1.2.3.6 Smell – Blue colour code**

Happening in parallel to the evaluation of the feel of the toilet facility, this category included elements which indicate lack of maintenance/cleaning.

This set of cards contains these elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust fan</td>
<td>This design intervention is useful to suck out odour and dry the floor. Students only saw it as a way of sucking out the smell.</td>
</tr>
<tr>
<td>Natural Ventilation</td>
<td>A design element, sufficient natural ventilation ensures minimal odour and quick drying of floors once they become wet</td>
</tr>
<tr>
<td>Odour</td>
<td>Resultant to the above 2 design elements, the toilet could either have no odour or the stench of urine and faeces</td>
</tr>
<tr>
<td>Sanitary waste smell</td>
<td>Resultant to the above 2 design elements, girls’ toilets could either have or not have this smell</td>
</tr>
</tbody>
</table>

**Table 5 Elements measured by the smell cue cards**

**4.4.1.2.3.7 People – Red colour code**

Used to identify aspects about people like the processes of maintenance and users’ habits.
This set of cards contains these elements

| Cleaning Staff | A cleaning staff is one who is responsible for ensuring that the toilets were clean, usable, and smell free. This element only judged if the school had such staff or not |
| Toilet Supervisors | A supervisor is one who ensures that the cleaning staff do a thorough job. He/She also takes complaints and ensures that they are dealt with |
| Complaint Centre | A formal structure for schools where students can lodge complaints anonymously, escalating the issue to the administrator (principal/HM) in case it was not addressed by the supervisor/cleaning staff |
| Users' habits | During our pilot, students indicated that student's habits affected the cleanliness of the toilet facility, thereby affecting their own usage. It affected both genders. This card identified the need for intervention at a basic level, and can be used as an indicator of the efficacy of health and sanitation education at the school |
| Clearing Dustbins | A critical function of the cleaning staff, this card helped us evaluate the quality of work done by the cleaning staff |

Table 6 Elements measured by the people cue cards

These cards indirectly evaluated factors related to the facility like

<table>
<thead>
<tr>
<th>Type of card and factor it evaluated</th>
<th>Look</th>
<th>Smell</th>
<th>Feel</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>Natural light Sufficiency of toilets Hanger/Bag hook Gap between wall and door frame Cubicle dustbin No handwash toilet inside school building Queue Peek proof windows/ventilator Proximal handwash to toilets</td>
<td>Exhaust fan</td>
<td>Privacy Dampness and mustiness Cubicle space Common area space Stuffiness Dampness (wet floors etc)</td>
<td></td>
</tr>
<tr>
<td>O&amp;M</td>
<td>Clogged WC</td>
<td>Soap - handwash</td>
<td>Water quality</td>
<td>Main door shuts</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>------------</td>
<td>----------------</td>
<td>---------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Value Add</td>
<td>Basic Infra - Bucket in toilet</td>
<td>Quality of buckets</td>
<td>Basic Infra - Mug in toilet</td>
<td>Quality of mugs poor</td>
</tr>
</tbody>
</table>

**Table 7 Toilet design aspects measured different cue cards**

**4.4.1.2.3.8  The process of the mind map**
The mind map took about 25 – 40 minutes per group based on the length of the discussion. It was conducted with the Administrator, a set of teachers and the students separately. Sometimes, the administrator called a teacher to be part of the mind map with them due to time constraints. Often, teachers preferred interviews over this method by stating lack of time.
From class 6 upwards till class 10 (if available), groups of 5 boys and 5 girls separately used the mind map tool and generated data. Below is the flow of this process:

After stating our commitments regarding anonymity of data provided, we moved on to explain the objective of this exercise and the rules.

- The group was asked to rate the sanitation facilities on a scale of 5 (5 being best and 1 being worst). 1 and 2 indicated poor sanitation facilities, 3 meant average, 4 and 5 meant good facilities.
- They started by picking up the cards indicating elements existing in the current sanitation facilities – this would give us an understanding of what was being evaluated and how it was perceived by different groups of users.
- They prioritized the cards in order of importance affecting their usage (both good and bad).
- They then grouped the cards into 3 categories in the order of importance already created as:
  - Non-negotiable – factors which ensured that they never used or avoided using the toilet
  - Negotiable – factors which were of medium importance. The presence of or absence of these factors were noticed, but the usage of the facility wasn’t affected. These were the factors the users would consider, only if they were already using the toilet.
  - Others – other factors which did exist, but made no difference to the user.
- They were asked to define good sanitation according to them and state where they experienced it.
- Sufficient space was allowed for the students to provide a hypothetical change in rating of the sanitation facility if the non-negotiable identified by them were modified to be better to understand perceived change of sanitation quality.

4.4.1.2.3.9 Benefits of this mind map tool

- As it was perceived as non-standard, the students were more willing to attempt it, as compared to an interview or focus group discussion (FGD). It reduced the stress of having to know all the answers.
- It shifted the focus of the discussion to inside the group as compared to an interview or FGD where it would have been with the interviewer. This meant that the discussion was among peers with similar knowledge and experiences using the school's sanitation system.
- The ice was broken much faster than during an interview or FGD, making them more comfortable discussing various issues that would be considered too personal to discuss with the interviewer. With girls, it was noted that issues which indicated poor maintenance were easily discussed as the selection or non-selection of the cards mandated a discussion.
- Being visual, it allowed for rich discussions. It facilitated friends to understand themselves better, making their communication about this issue more clear.
- Based on the colours, it helped all stakeholders realise that there were sufficient elements which could be appreciated as well as marked for change.

4.4.1.2.3.10 Data Analysis

The mind map tool allowed us to identify the impact of individual elements of sanitation on users’ (students and teachers) decision to use or not use the sanitation facility. The users categorized the cards by order of importance into 3 categories-
• Non-negotiable – elements which had to be present or absent for one to use or not use the sanitation facilities. Changes in these elements made a significant difference to the users, taking the rating of a sanitation facility from 2 (poor) to 4 (good).
• Negotiable – elements which could be present or absent, but were noticed. Changes to these elements made a marginal difference to the users.
• Others – the presence or absence made little difference to the users.

Analysis of cards was done as below -

• Based on the number of cards chosen for a particular segment (non-negotiable, negotiable and others), and the card’s position in the selected cards, a score was assigned to it.
• This score was averaged across the number of samples per school to create 2 scores – one for the boys and one for the girls. In case of an all-girls school, only one score was created.
• Based on the type of school management, the sum of all scores for a particular element (for its use in Non-negotiable, Negotiable and Others category) was calculated and compared. The highest score for any category decided under which category the element was categorised.
• Based on this data, elements were extracted and further categorised into 3 sub heads to identify which functional head in the school to assign ownership/responsibility to:
  o Design – child friendly, gender sensitive – all the elements clearly mentioned in the design suggestions of the policies fell under this category.
  o O&M – Operations and Management – all elements based on operations and maintenance of the facility fell under this category
  o Value Adds – any element not clearly mentioned, or where parameters were clearly not defined fell under this category.
• Order of implementation of solutions was suggested on the priority of cards placed by the students. This helped the administrator in evaluating and upgrading student sanitation systematically, effectively with highest impact.

4.4.1.3 Interview
In some schools with students from Grade 6 and 7, the mind map became very cumbersome, due to the colorful nature of the cue cards. Students started focusing more on hoarding the cards than sharing the data. In those cases, we resorted to informal, unstructured interviews loosely based on the questionnaire used to guide the whole research format. Teachers also preferred interviews over the mind map.

4.4.1.4 Implementation
This stage involved us making simple interventions along with the students. The objectives for this stage were:

• Create ownership in the students for a solution
• Increase the quality of sanitation and ensure its continuance
• Create an awareness among students of the need for better sanitary habits

Interventions were considered based on the standards suggested by various authorities. We considered the following standards, codes, guidelines and project guidelines.

1. The Indian Standard Code of Basic Procedures for Water Supply, drainage and Sanitation (IS 1172:1993) by the Bureau of Indian Standards is used as a basis for many schemes and programs. This provides recommendation for minimum desirable sanitation facilities. The following parameters are based in the IS1171:1993 standards
prescribed above. Each has made value additions and suggested them to schools under their preview, marking them as essential and important to be provided in each school despite differences in resources.

![Figure 5 - Policies and building codes based on the IS 1172](image)

2. The National Building Code\(^6\) uses the same guidelines as prescribed by the IS 1172:1993. Below is the section defining the basic standards for sanitation:

<table>
<thead>
<tr>
<th>Table 10: Schools and Educational Institutions, IS 1172:1993</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Fitments</th>
<th>Boys</th>
<th>Girls</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water Closets</td>
<td>1 per 40</td>
<td>1 per 25</td>
<td>1 per 8</td>
<td>1 per 6</td>
</tr>
<tr>
<td>2</td>
<td>Ablution taps</td>
<td>1 for each water closet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Urinals</td>
<td>1 per 20</td>
<td>1 per 20</td>
<td>1 per 25</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Wash Basins</td>
<td>1 per 60, minimum 2</td>
<td>1 per 40, minimum 2</td>
<td>1 per 8</td>
<td>1 per 6</td>
</tr>
</tbody>
</table>

Table 8 Table 10 from Schools and Educational Institutions, IS 1172:1993

For staff, the ratio is 1 closet per 25 staff. The rest of the parameters (ablution taps, washbasins) are the same as that of students.

3. The Code of Basic Requirements for Water Supply, Drainage and Sanitation\(^7\) (4th Revision, IS1172:1993) updated last in February 1993 suggests that the non-residential schools should ensure the availability of about 45 litres of water per person per day.

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\(^6\) [http://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&sqi=2&ved=0CCUQFjAA&url=http%3A%2F%2Ftcpomud.gov.in%2FDivisions%2FMUTP%2FBBBL%2Fchap05.doc&ei=wMAeU4KB8UeAex1rGQBw&usg=AFQjCN97yaCEXMSf1FCdlg5q5b7Z51rg&bvm=bv.62788935,d.bmk](http://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&sqi=2&ved=0CCUQFjAA&url=http%3A%2F%2Ftcpomud.gov.in%2FDivisions%2FMUTP%2FBBBL%2Fchap05.doc&ei=wMAeU4KB8UeAex1rGQBw&usg=AFQjCN97yaCEXMSf1FCdlg5q5b7Z51rg&bvm=bv.62788935,d.bmk)

\(^7\) [http://www.bis.org.in/sf/ced/ced24_7823_.pdf](http://www.bis.org.in/sf/ced/ced24_7823_.pdf) The Draft 5th Revision 1772:2011 states the same numbers
The following table compares the IS1772/NBC, and other guidelines using the IS1172:1993 guidelines as the basis for comparison.

<table>
<thead>
<tr>
<th>If Modified</th>
<th>NBC</th>
<th>NSSI</th>
<th>SSHE</th>
<th>SSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic numbers prescribed by IS 1172</td>
<td>In table 10, described above</td>
<td>Same</td>
<td>Modified</td>
<td>Modified</td>
</tr>
</tbody>
</table>

### Girls WC

**Ratio**
- 40 girls + 1 teacher : 1 WC
- 25 girls : 1 WC
- As per "Modified" column
- As per "Modified" column
- As per "Modified" column

**Clothes hanging hook**
- 2 numbers installed at suitable height for 5 yr old and adult
- Not defined
- As per "Modified" column
- As per "Modified" column
- As per "Modified" column

**Niche in wall (Sanitary pads)**
- Yes
- Not defined
- As per "Modified" column
- As per "Modified" column
- As per "Modified" column

**Ventilation**
- 450x450 mm size
- Should allow sunlight for self drying
- Not defined
- As per "Modified" column
- As per "Modified" column
- As per "Modified" column

**Door**
- Door, 2100 mm
- Not defined
- As per "Modified" column
- As per "Modified" column
- As per "Modified" column

### Girls Urinal

**Ratio**
- 20 girls : 1 urinal
- 20 girls : 1 urinal
- As per "Modified" column
- As per "Modified" column
- As per "Modified" column

**Flush**
- Innovations allowed, recycled water preferred
- Not defined
- As per "Modified" column
- As per "Modified" column
- As per "Modified" column

**Ventilation**
- Should allow sunlight for self drying
- Not defined
- As per "Modified" column
- As per "Modified" column
- As per "Modified" column

**Door**
- Screen Door, 1500 mm
- Not defined
- As per "Modified" column
- As per "Modified" column
- As per "Modified" column

### Boys Urinal

**Ratio**
- 20 boys + 1 teacher : 1 Urinal
- 20 boys : 1 Urinal
- As per "Modified" column
- As per "Modified" column
- As per "Modified" column

**Flush**
- Innovations allowed, recycled
- Not defined
- As per "Modified" column
- As per "Modified" column
- As per "Modified" column
Table 9 IS1772/NBC compared to other guidelines

4.4.1.4.1 Difference in the staff and student toilets
A stark difference in the quality of toilets and maintenance of students and teachers was noticed. This was observed even in the most basic government schools, except in one where both used the same facilities. Some time was spent trying to understand the differences and the reasons for them.

4.4.1.5 Water Quality Testing
Water quality refers to the chemical, physical and biological characteristics of water. It is a measure of the condition of water relative to the requirements of any human need or purpose. It is most frequently used by reference to a set of standards against which compliance can be assessed. The most common standards used to assess water quality relate to health of ecosystems, safety of human contact and drinking water.
We tested water under 13 parameters, the details made available in the relevant section.

4.4.1.5.1 Relevance of the test
This testing came in the wake of observations that in government schools, students still drank water from the tap without any treatment and in private schools, they rinsed their mouths. In both schools, this water was used to wash themselves in the toilets.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Caused by</th>
<th>Limit</th>
<th>Impact on health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardness</td>
<td>Hard water has Calcium and Magnesium salts in excess</td>
<td>200 mg/L</td>
<td>Kidney stones</td>
</tr>
<tr>
<td>Chloride</td>
<td>sewage and industrial effluents, urban runoff containing de-icing salt and saline intrusion</td>
<td>250 mg/l</td>
<td>nausea and vomiting</td>
</tr>
<tr>
<td>pH</td>
<td></td>
<td>6.5-8.5</td>
<td>Acidity</td>
</tr>
<tr>
<td>Alkalinity</td>
<td></td>
<td>200 mg/L</td>
<td>N/A</td>
</tr>
<tr>
<td>Nitrate</td>
<td>human sewage and livestock manure</td>
<td>45 mg/L</td>
<td>Blue Baby Syndrome</td>
</tr>
<tr>
<td>Phosphate</td>
<td>Pesticides</td>
<td>5 mg/l</td>
<td></td>
</tr>
<tr>
<td>Residual Chlorine</td>
<td>Filtration systems etc</td>
<td>1 Mg / l</td>
<td>Cancer</td>
</tr>
<tr>
<td>Fluoride</td>
<td>Most water supplies contain some naturally occurring fluoride. Fluoride also enters drinking water in discharge from fertilizer or aluminum factories.</td>
<td>1 mg/L</td>
<td>bone fractures in adults</td>
</tr>
<tr>
<td>Iron</td>
<td>Naturally occurring, Industries</td>
<td>0.3 mg/L</td>
<td>haemochromatosis, - normal regulatory mechanisms in body do not operate effectively, leading to tissue damage</td>
</tr>
<tr>
<td>Ammonia</td>
<td>fertilizer and animal feed production</td>
<td>0.5 mg/L</td>
<td>toxic effect on healthy humans only if the intake becomes higher than the capacity to detoxify</td>
</tr>
<tr>
<td>Nitrite</td>
<td>human sewage and livestock manure</td>
<td>-</td>
<td>Blue Baby Syndrome</td>
</tr>
<tr>
<td>TDS</td>
<td></td>
<td>500 mg/L</td>
<td></td>
</tr>
<tr>
<td>H2S Bacteria</td>
<td>Human or animal faeces</td>
<td>Negative</td>
<td></td>
</tr>
</tbody>
</table>

Table 10 Water quality test conducted on samples from sample schools
5 The situation as it is

Sample of Private school sanitation facilities – well spaced toilets with sufficient space, a ledge (elevation to stand on, so that the urine coming out of the pipe doesn’t touch the user.

Inside the girl’s toilet as PS3 – naturally ventilated with artificial lighting, with a bucket to access water inside, a tall door to ensure privacy, clean floors and a double hook, one hook occupied with a ring of newspapers for wrapping sanitary pads.
A view of the hand wash area and water closet at PS8. Note the soap dispenser, a ring for towels, sufficient lighting (natural lighting ensures quick drying)

A new toilet built in early 2012 at GS9. It has 6 cubicles, designed as shown in the photo below. It is spacious, well drained and has a hand wash inside the toilet complex. This is for girls below class 7.
A waterless urinal for boys in GS7

A waterless urinal for girls at GS3
Private schools with their vastly higher resources spend more on their sanitation facilities. As shown in the above images, each school has attempted to provide what they feel is basic provisions in a sanitation facility. However, they are all bound by some basic regulations. With Government schools, there is a clear difference in the appearance, maintenance of the toilets

5.1 Policies and Regulations - applicable

5.1.1 Private schools

In terms of the policies and regulations that apply to this context, the Karnataka Education Act states that

“Every educational institution shall provide-

- Safe and potable drinking water in quantities sufficient for all the students, located at convenient points within the building.
- Adequate toilet facility, urinal accommodation, dining hall and canteen within the premises of the institution and maintained in good sanitary condition, ensuring sufficient water supply at all points. ...toilet facility and urinal accommodation shall be provided separately for boy students and girl students.”

The private schools are free to build sanitation systems which are in accordance with the National Building Code, which is based on the IS 1172:1993. The stipulations of this regulation is presented in the first chapter of this report. Beyond this, there are only suggestions. Based on the type of private school, they are placed under the ambit of various programs like

- Government aided school – SSA via SSHE. These schools are eligible for funds from the government.
- Private school – SSHE under its own funds
- CBSE school – any school following the curriculum of this board falls under the NSSI

In all the cases, we found that the sanitation facilities were built by the architect based on the discussions with the management board, and not the administrators.

When we spoke to architect who had designed toilets for private schools, these were his words-

*On the condition of anonymity, designs are made under a lot of restrictions. The primary focus is always on space allocated to facilities like classrooms etc. Toilets*
and sanitation-related facilities are low on the management’s priorities and therefore, toilets are often poorly designed in terms of lighting, space, ventilation.

5.1.2 Policies applicable to Government and government aided schools

Under the latest regulations, these are the policies applicable to government schools and government aided schools -

- SSHE – The SSHE technical manual contains guidelines on design with measurements as shown in the Annexure.
- SSA – designed to ensure free and compulsory education for classes 1 – 8, this follows SSHE design suggestions and provides up to Rs 25,000 per school to rebuild the toilets. The SSA officer decides which school requires a toilet overhaul. Any school requesting additional toilets is put on a queue, and made to wait for approval. All additional costs are to be borne by the school by finding sponsors.
- RMSA – It follows the SSA principles. While it gives a grant of about Rs 50,000 to do amongst many things, “minor repairs” to toilets, it specifically does not mention any grants to upgrading a school’s sanitation system.

5.1.2.1 Process for upgrading sanitation facilities

All new schools are allowed to build toilets as part of the grant. Upon utilization of this grant, there is no separate fund dedicated only for upgrading the toilet facility. The designs are provided by the SSA engineers deployed by the BBMP in Karnataka, and the Education Department has no control over the design or construction. When a SSA official was asked about how schools get to build toilets, his words were:

_They Government under SSA provides Rs.25,000 for the construction of the entire sanitation facility to the school’s School Development and Monitoring Committee and requests them to raise funds and manage costs on their own through donors. Based on the funds available with the donor, certain design regulations can be bypassed. At least the school will have toilets right?_

In case there is a request to increase the number of toilets, or to split Boys and Girls toilets, or to split teachers (male- female) toilets, the department passes it on the Zonal Engineer.

5.1.2.2 Design

All of the schools studied, except one, had toilet facilities designed before the SSA came into practice. Therefore, though they have separate boys and girls toilets, they were built visibly quite different from the newer SSA based designs, affecting the students’ perception of them.

5.2 Facilities as they exist in private and government schools

Legend for the below cells:

- green = conform to the mandated norms (IS1172)
- pink = clear violation
- red = difference between installed and functional infrastructure, creating additional load on the existing facilities
| Parameters                          | Gender based student : facility ratio | IS mandated students:facility | PS1 | PS2 | PS3 | PS4 | PS5 | PS6 | PS7 | PS8 | PS9 | PS10 | GS1 | GS2 | GS3 | GS4 | GS5 | GS6 | GS7 | GS8 | GS9 | GS10 |
|------------------------------------|---------------------------------------|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Water closet                       |                                       |                             |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |
| Boys: (Installed)                  | 40                                    |                              | 21  | 180 | 0   | 0   | 6   | 22  | 40  | 32  | 61  | 130  | 0   | 81  | 0   | 18  | 28  | 55  | 138 | 10  | 13  | 63  |
| Boys: (Functional)                 | 40                                    |                              | 21  | 180 | 0   | 0   | 6   | 22  | 40  | 32  | 61  | 130  | 0   | 122 | 0   | 10  | 13  | 55  | 276 | 10  | 7   | 39  |
| Girls (Installed)                  | 25                                    |                              | 15  | 80  | 35  | 28  | 52  | 15  | 16  | 11  | 27  | 69   | 11  | 9   | 27  | 11  | 9   | 41  | 13  | 18  | 33  | 138 | 10  |
| Girls (Functional)                 | 25                                    |                              | 15  | 80  | 35  | 28  | 52  | 15  | 16  | 11  | 27  | 69   | 11  | 9   | 27  | 11  | 9   | 41  | 13  | 18  | 33  | 138 | 10  |
| Ablution taps                       |                                       |                             |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |
| Boys                               | 1 per closet                          | y                           | y   | y   | y   | y   | y   | y   | y   | y   | y    | n    | y   | n   | y   | y   | y   | y   | y   | n   | y   | y   |
| Girls                              | 1 per closet                          | y                           | y   | y   | y   | y   | y   | y   | y   | y   | y    | n    | n   | n   | y   | y   | y   | y   | y   | n   | y   | y   |
| Urinals                            |                                       |                             |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |
| Boys                               | 20                                    | 0                           | 45  | 0   | 0   | 49  | 21  | 13  | 43  | 0   | 0   | 0    | 39  | 0   | 0   | 0   |
| Girls                              | N/A                                   | 0                           | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |
| Wash basins                        |                                       |                             |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |
| Boys                               | 60                                    | 14                          | 45  | 10  | 106 | 83  | 39  | 39  | 41  | 28  | 12  | 26   | 46  | 62  | 244 | 67  | 20  | 34  | 45  | 19  | 14  | 63  |
| Girls                              | 40                                    | 10                          | 30  | 106 | 83  | 39  | 39  | 41  | 28  | 12  | 26   | 46  | 62  | 244 | 67  | 20  | 34  | 45  | 19  | 14  | 62  |
| Assessment                         |                                       |                             |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |
| Good                               |                                       |                             |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |
| Poor                               |                                       |                             |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |
| Poor                               |                                       |                             |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |
| Good                               |                                       |                             |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |
| Moderate                           |                                       |                             |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |

Table 11 Overview of the existing facilities in Private and Government school
The assessment above has been done on this basis:

- **Good**: Majority of the parameters meet the norms
- **Moderate**: Equal number of parameters meet and don’t meet the norms
- **Poor**: Majority do not meet the norms

### 5.2.1 Some other observations

#### 5.2.1.1 Private schools

- **PS1** has 2 pit latrines—one each for the boys and girls. Built with left over cement rings from an exhausted septic tank, this system cost nothing to build. The walls have been built with woven coconut leaf mats. The Boy’s pit is about 6-8 feet deep, and is still functional after 1.5 years. The Girl’s pit is about 4-6 feet deep, and has to be emptied once a year. During the interviews, we noted that the girls preferred the standard toilet over the pit toilet due to better privacy.
- **PS2** has a common hand wash point for both boys and girls, which is on the way to both toilets. This point features about 6 taps and the used water flowed into the plants close by. For the boys’ urinal, it used a wall with partitions as allowed in the guidelines. It was also without a roof, allowing for excellent natural lighting and ventilation, but exposing the users to rain.
- **PS3** had teachers bringing up issues with the toilet design which the students were hesitant in bring up. The approach to do this was democratic, with the teacher suggesting problems and asking the girls if they agreed or not.
- **PS8** has a well-designed sanitation facility which is spacious, naturally well-lit and ventilated to meet all the requirements of the guidelines.
- **PS9** has an incinerator and a sanitary pad vending machine, which none of the other schools has. The system the school has put to ensure good usability is very well structured and effective.
- None of the schools had a toilet for physically challenged students, as they had no students with such needs.

#### 5.2.1.2 Government Schools

- **GS1** had urinals for girls as it was a school serving classes 1 – 7. However, with no partitions between these urinals (as shown in the second picture below), though it was used, they students preferred the Indian water closet which had a door.
- **GS3** is an interesting case, where due to better drainage facilities, the girls’ toilet was moved to what was built as the boy’s toilet and vice versa. Hence, there are 5 urinals in the girls’ toilet and the boy’s toilet is highly underequipped. The boy’s toilet has a sink with a tank of water and the girls have to go to a location about 300 meters away to wash their hands. The teachers use the same toilet facility as the students, though they have reserved one cubicle for themselves. Because of this, their understanding of student’s sanitation is better than other schools.
- **GS5** has no doors in the girl’s toilet. Hence the girls avoid using the toilets.
- **GS6** has 2 girl’s toilets. As the younger girls end up messing the toilets, the senior girls go home to use the toilets.
- **GS7** had low cost urinals installed in place of a wall space. However, under the guidance of the SDMC, the roof was redone to prevent leakage, and a donor was brought in to replace these low cost urinals with standard urinals. The girls have one Indian water closet and about 9 urinals. Due to privacy concerns, all the girls stand in a long queue to use this one closet during the lunch break.
5.3 Maintenance - process, people and decentralization of permissions, roles of stakeholders

5.3.1 Private schools

Maintenance is a huge component to preserve the well-built sanitation facilities in good working condition. Most of the private schools approach sanitation in a hierarchical manner. We found that most of the schools had staff, the number and responsibilities varying below as shown. Also shown in the table is the role of the toilet supervisor if one exists.

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<thead>
<tr>
<th>School</th>
<th>No of cleaning Staff</th>
<th>Role</th>
</tr>
</thead>
<tbody>
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</tr>
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</tr>
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<td>4</td>
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</tr>
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<table>
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<tr>
<td>PS10</td>
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<td>PS8</td>
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</tr>
<tr>
<td>PS9</td>
<td>-</td>
</tr>
<tr>
<td>PS10</td>
<td>-</td>
</tr>
</tbody>
</table>
Defined (as a process) | - | - | - | - | - | - | - | Y | -

Salary (per person per annum) | 0 | 3000 | N/D | N/D | N/D | N/D | 60,000 | N/D | N/D

Consumables (p.a) | 15,000 | 20,000 | 15,000 | 10,000 | N/D | 35,000 | 20,000 | 35,000 | 40,000 | N/D

Table 12 Overview of sanitation staff, supervisor and consumables in a Private school

Supervisors:
Usually senior staff who have worked with the school for sufficient years, these staff may or may not exist in all schools. In many schools, a teacher or the principal acts as the supervisor. Their roles are decided at the discretion of the principal or the management to whom the principal reports to. The cleaning staff report to this post. His or her role includes:
- Ensuring cleanliness
- Fixing issues or complaints relayed to them
- Ensure all the supplies needed for the task of cleaning the toilets are present and made available to the cleaning staff when needed

The students we spoke to complained that the staff were ineffective, or that the supervisor did nothing. The management in many cases hadn’t heard of complaints about the toilet, thus ignorant of the students’ plight.

Process
With access to the basic equipment like phenyl, mops, the cleaning staffs clean the toilets on an average, twice a day. A few even have checklists to sign off on after completing their tasks, like in PS8 or PS9.

Table 13 Frequency of cleaning - Private Schools

Water usage – While some schools use buckets, we found variations in the quantity of water used. In other schools, the staff cleaned toilets with a water pipe. There was also a sufficient variation in the time at which cleaning occurs. The water closets were cleaned once a day. Most often, the floor was cleaned after use by students themselves (usually post lunch and after they left) with phenyl or lizol.

The water usage is more than the government schools.

5.3.2 Government schools
According to the SSA/SSHE, the operation and maintenance (O&M) that can be done are as follows:
- The O&M responsibilities may be handled by child cabinets. Health clubs under the overall supervision of teachers/head teachers. The students should be assigned tasks by rotation

8 Common disinfectants
The role of school WATSAN committee/School Management Committee and PTA, etc., should be well coordinated. This, in turn, is expected to ensure:

- Resource mobilization for O&M funds, i.e. for soap, brush, bucket from Parent Teacher Association, School Management Council etc. (maybe on an annual basis)
- Roster of responsibilities (irrespective of caste and class) to make sure all children wash hands with soap before and after eating and going to the toilet and to involve children in cleaning the latrines, water point area, and fill water reservoir, check for leaks, cleaning the compound etc.
- Creative use of IEC and training to ensure school-led O&M
- Drawing up of maintenance schedules and allocation of responsibility such as who will clean and who will monitor on a rotation basis among the students.
- Manage stock of parts, tools and supplies
- Conduct survey on O&M improvement, meetings and respond with solution against user complaints.

**Drawing 1:1.**

![Diagram of suggested sanitation maintenance by the SSHE and SSA](image)

5.3.2.1 *Inherent contradictions in the Government school system*

The SSHE also suggests that one can allow students to assume responsibility of their sanitary facilities so that they develop the ownership. But, in contradiction to this, depending on the number of students catered to by the school, the government provides the schools D Category employees. This category of employees is in charge of the upkeep of the school campus including sanitation facilities. Since the last 2 years, the government has been hiring contractors to do the same.

The BEOs have passed orders stating that students are not to be involved in the maintenance of sanitation facilities, leaving the schools to fend for themselves.

Figure 6 Overview of suggested sanitation maintenance by the SSHE and SSA
Challenges faced by the school administration in managing the support staff to assure good sanitation:

- Though a principal claimed to have a manual of these employee’s responsibilities and duties, he was unable to find it. Their job description loosely includes maintenance of the school's cleanliness. It is left to the principal’s discretion to hold these employees accountable for conducting their duties. In the 3 schools with Group D employees, only one school staff had any form of proactivity.
- In the case of schools that employed support staff, the staffs’ responsibility ends with the maintenance of cleanliness in the toilets. Any repair work has to be done by the teachers themselves, either personally or by hiring an external person.
- Due to this high level of hierarchy, and lack of support to fixing issues (private schools encourage local support staff to fix issues like broken taps etc and then reimburse their expenses), there is little ownership by all the stakeholders.
- A suggestion in the School Development and Maintenance Committee’s roles is to ensure that the toilets are clean and usable. This too does not happen.
- Often, government schools are targets for vandalism, leading to greater damage on property.

Availability of funds as per SSA:

Each school get these funds from the government:

- Maintenance fee – Rs 15,000 per annum for all expenses and minor repairs
- Sanitation allowance – Rs 1,500 per annum for consumables in the toilet like phenyl, Harpic etc. Not all schools had got this amount.

In the cases where the school had employed a person to clean the toilets, the teachers were funding this person's salaries from their salary.

Process of cleaning

The staff are usually given an instruction to clean the toilets. As there is no supervisor, and the pay per person is about Rs 1,000 per month, the quality of cleaning is not always high. Toilets are cleaned with water, and periodically with chlorine.
On an average, the per user water guideline of 45 litres is not met in these schools. The average per capita water consumption in these schools was below 10 litres per day.

### 5.4 Health and Hygiene - how is it promoted, tools/infrastructure used

To understand if there was any difference in the toilet utilization rates of students of private schools and government schools, some effort was dedicated to understanding how many students use the toilets once a day. Often, this answer came as part of the discussions created by the “long queue” card. In the other cases, where this discussion did not happen, this question was asked - “how many of the students use the toilet?”.

### Table 14 Frequency of cleaning - Government schools

<table>
<thead>
<tr>
<th></th>
<th>GS1</th>
<th>GS2</th>
<th>GS3</th>
<th>GS4</th>
<th>GS5</th>
<th>GS6</th>
<th>GS7</th>
<th>GS8</th>
<th>GS9</th>
<th>GS10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of cleaning (times a day)</td>
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<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

### Table 15 Ratio of students using the toilets - Private schools

As shown by the table above and below, most of the students in the schools do not use the toilets frequently.

### Table 16 Ratio of students using the toilets - Government schools

The next question was to understand if the schools had a formal approach to discussing health and hygiene with the students. To keep the pressure to respond favorably off the staff, this question was asked in a casual manner. Both private and government school staff reported that this topic was discussed. The depth of this discussion or the openness was unascertainable. When asked how this topic was discussed, the most common response was “in class as part of science” or in assemblies. Students however claimed to not recall such matters being discussed in a manner influencing behavior.

### 5.5 Challenges faced by administrators while ensuring good sanitation through O&M

#### 5.5.1 Private schools

How students use the toilets creates challenges for the administrators while ensuring good O&M. Private school students use toilets to

- Change clothes
- Socialise, to meet friends and discussing various topics not encouraged in a classroom.
• Students use this space to play pranks, sometimes leading to broken infrastructure like doors or taps.

5.5.2 Government schools
How students use the toilets differently in government schools:

• More often than not, students do not use toilets here. This is more pronounced than in private schools. Since this data cannot be verified, and is hearsay, it has not been documented.
• Government schools ban eating snacks like chips etc to prevent littering. The students smuggle waste into the toilets and eat them there, and dump the covers into toilets, often jamming them.
• The approach to using toilets is quite different between private and government schools. It is common to see dirty toilets, and students urinating all over as the toilets are not cleaned.
• Damage done to toilets in government schools is either due to vandals who come to steal pipes and metal to sell to buy alcohol or due to severe shortage of toilets and other students trying to hurry the person inside the toilet up by banging on the door. This is relevant as it helps us understand the need for sufficient number of toilets.

5.6 Water Quality
Water sample from the hand wash was taken to understand the quality of it. In government schools, the same water from another tap was used as drinking water. All parameters highlighted with orange were in excess to the prescribed norms.

5.6.1 Source of water
The government schools typically sourced their water from the government water supply, either through a community tank and bore well, or through a typical water connection. Hence the water supply the school has was limited.

The private schools had their own bore wells, or got water through water tankers.

5.6.2 Use of water
It was noted that the Government school students regularly consumed the water from the tap, as they claimed to do at home. The private school students had separate drinking water facilities and used untreated water in toilets for hand wash, face wash and occasionally mouth wash.
### Water quality in Government schools

<table>
<thead>
<tr>
<th>School Name</th>
<th>H2S</th>
<th>pH</th>
<th>Alkalinity</th>
<th>Nitrate</th>
<th>Phosphates</th>
<th>Residual Chlorine</th>
<th>Hardness</th>
<th>Fluoride</th>
<th>Chloride</th>
<th>TDS</th>
<th>Iron</th>
<th>Ammonia</th>
<th>Nitrite</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suggested Levels</strong></td>
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<td>6.5-8.5</td>
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### 5.6.4 Water quality in Private schools

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6 Data Analysis

6.1 Gaps in regulation and reality

There are gaps between regulations and the actual ground reality. The older designs of sanitation facility were non modular and non-expandable. The technical manual (relevant sections in the annexure) illustrates modular and expandable designs of sanitation facility. This will allow for the user-is-to-toilet ratio to remain the close to the mandated levels. To emphasize the impact of non-functional infrastructure, the charts indicate 2 factors –

- the ratio taking into account the installed number of toilets to the number of students
- the functional number of toilets to the number of students.

6.1.1 Students to Urinal ratio

![Boys to urinal ratio](image)

**Figure 8 Boys to Urinal ratio**

This ratio indicates the number of boys per urinal. The state of maintenance was varied - some in perfect condition to missing flush pipes and drain pipes. Of the 8 schools with urinals for boys, 4 of them had significant gap between mandated numbers and actual numbers.

![Girls:Urinals](image)

**Figure 9 Girls to Urinal ratio**

2 schools had urinals for girls. The mandated number was 1 urinal for every 20 girls. However, these urinals were often not used due to a lack of privacy.
6.1.2 **Student or teacher to water closet ratio**

![Boys:Water Closet](image1)

**Figure 10 Boys to Water Closet ratio**

![Girls:Water Closet](image2)

**Figure 11 Girls to Water Closet ratio**

The above tables indicate the gap in student to water closet ratio (mandated, installed and functional). The non-functional toilets for boys are less often seen than the same for girls, probably due to a reduced load on them.

Observations from the field:

- GS3 has allocated each class a particular time to use the toilet, and ensure that none of them use it during the lunch break, thus solving their huge shortage of infrastructure.
- The spike in GS7 is due to the fact that they have 9 urinals for girls, and due to the lack of privacy, none of the students use it. It was observed that few used it only in times of extreme urgency, and these were students in the first 3 classes.
It was observed that staff toilets were more clean than the student toilets. The reasons attributed to this were:

- Less users per toilet, hence better maintained
- Teachers toilet, hence better maintained
- Better user habits, hence self-maintained

### 6.1.3 Water consumption

The Indian Standards mandates that every student should have access to at least 45 litres of water everyday. Observations indicated that the private schools were often closer to this number than government schools due to:

- Large storage tanks
- Better sources of water, in many cases independent of the Government
- Easier access to funds
- Regular maintenance, bill clearance and focus on giving a better experience to the student

### 6.2 Other baselines:

#### 6.2.1 User rating : Number of support staff

It was observed that toilets which got a higher user rating had these characteristics:

- Well lit and ventilated (natural sources of lighting and ventilation were preferred, but in the case where this was not possible, artificial sources were accepted)
- Well maintained – no infrastructural issues, and highly usable (clean, no smell, access to water and ability to use it, a sense of privacy)
- Dry – the floors were cleaned often and allowed to dry, as compared to the floor being dirty (grime from footsteps, wet floors)
- Sufficient access to water – enough for the students to feel they had uninterrupted access to water.

![Staff:Water closet](image-url)
Figure 13 User rating of toilet against support staff number

The above graph shows that there is no correlation between the number of support staff and the user’s ratings. There were 3 schools with a 4 (good) rating. One was a government school, but with a very low user: toilet number, ensuring that the toilet appeared clean always and allowing a high degree of access to water. The other 2 schools were private schools with a very clear flow of maintenance routines.

6.3 Data from the Cue cards

The cue cards helped identify elements which students considered influential to their use or disuse of the toilets. The objective of this is to ensure that the school administrators have the knowledge of which elements to fix on a priority and its impact on the toilet usage. Most of the charts are self-explanatory.
Figure 14 Overview of scores across Design, O&M, and Value addition by Private Schools

Table 19 Overview of scores across Design, O&M, and Value addition by Government Schools
6.3.1 Data from PS1

This chart helps identify in a similar macro level the impact of Design, O&M and Value additions across the sample private schools.

PS1 being a residential alternative education school is presented separately as the students also found the cards distracting due to the colours.

The summary of the informal unstructured interview with PS1 is as follows:

- Privacy is very important to them – there are 5 indian water closets, each with a door opening into an open passage. Each has a large ventilator with an iron grill on top of the door. As pranks, students either threw water or stones or jumped up and peeked into the toilets through the ventilators stripping the users off their sense of privacy.
- The toilets had lights, hence the students preferred this over the pit latrine in the nights.
- The light switch was outside in the passage, leaving the users prey to pranks. Younger students reported getting scared when others came and shut the lights off while they were using the toilets in the night. They reported that they went in groups to avoid this.
- Access to water was flagged as an issue. The school buys water from private water suppliers. Due to improper piping, they said that when the water levels were low, the toilets didn’t get water. This happened often in the nights.
- The cubicles had a common dustbin. Since there was no partition between the doors leading to the toilets, the girls felt awkward disposing off their sanitary pads in common view.
- Younger children reported getting scared with graffiti which spoke about ghosts, and avoided certain toilets because of the fear of ghosts.

The teachers knew of these issues, and had spoken to the students in groups. They had organized older students as leaders to ensure such pranks didn’t happen. As it was a school run by an NGO, and heavily dependent on funds, they had to prioritize their expenses, and operational costs took priority over fixing the sanitation facilities on the lines of the student’s expectations at the moment.

The average rating for the sanitation facilities was 2.
6.3.2 Importance of elements to Government school students

All the elements are divided under 3 heads – Non-negotiable, Negotiable, and others and then placed in order of importance to the students, which includes both boys and girls.

6.3.2.1 Guidelines on how to use this data

1. When attempting to bring about a change in the school’s sanitation, start with Non-negotiable factors, move to Negotiable and then to Others factors. For example, Impact of placing mugs will be higher than ensuring that there is no smell of sanitary waste or ensuring natural ventilation. However, the students see the installation of exhaust fans as a way to eliminate odour. It also helps dry floors faster if there is sufficient air circulation, which will have an indirect, unintended positive impact, ensuring that the cubicles are dry and relatively free of grime.
2. If on a budget, use the tool to evaluate the needs of the students, and compare against this chart. Compare priority assigned by the students against this chart. If same, select from the solutions provided and implement. Ensure that the staff are held accountable to ensure continuance of the process and standards established.

6.3.3 Importance of elements to Private school students

6.3.3.1 Observation from the tables – Government vs. Private schools

1. Government school students seem to prioritise facilities over usability as the private school students seem to be doing. For example, the government school students prefer a mug in the toilet and a clean toilet over clean toilets and usable toilets as indicated by the private school students. This clearly indicates the gap in maintenance between the types of schools.
2. The requirements of the private school students is on improving the experience of using the toilets as compared to getting good toilets and improving the ambience for the government school students.

Table 20 Elements selected by boys
Figure 15 Difference between element priorities - boys and girls

This chart highlights the different outlook between girls and boy students.
Figure 16 Difference between element priority - Private and Government school

This graph compares how students from private schools prioritized elements over government school students. It gives an insight into differences in functional infrastructure at both these types of schools. The private school students have basic functional infrastructure, but seem to be asking for greater quality in the toilets like artificial lighting, cleaning staff etc. The government school students are more focused on getting basic working infrastructure access to water, spacious common area, cubicle, functional latches etc.
7 On the ground

This section outlines the different innovations (which schools have undertaken on their own) and initiatives they have taken as a result of the mind map. This section contains both the processes that involved and the solutions that resulted. A small note - on the innovation, how it works, its challenges, costs, advantages and disadvantages – is also included. The initiatives section contains some simple initiatives the schools have adopted. A note on the use of these initiatives is also included.

7.1 Innovations

Innovations refer to simple system changes the schools have adopted to make sanitation facilities on campus better.

1. Pit Latrines
2. Waterless urinals
3. Grey water system
4. Cleaning work flow
5. Student pool

7.1.1 Pit Latrine

A pit toilet is a dry toilet system which collects human excreta in a large container which ranges from a simple slit trench to more elaborate systems with ventilation. The waste pit, in some cases, will be large enough that the reduction in mass of the contained waste products by the ongoing process of decomposition allows the pit to be more or less permanent. In other cases, when the pit is smaller and becomes full, it may be emptied or the hole made be covered with soil and the associated structure moved or rebuilt over a new pit.

Approximate cost to install: Rs 10,000 to Rs 15,000

- Digging charges of about INR 5,000
- Cement Rings based on depth
- Simple barriers made from materials ranging from woven coconut leaves to walls built from bricks and cement

Operational costs: Rs. 0

- In case there are issues with insects or flies, mud or ash can be used to cover the day's sanitary waste. The same applies to smell.
- In case it gets filled, it may be emptied or the hole made be covered with soil and the associated structure moved or rebuilt over a new pit.

Advantages over traditional toilets:

- They do not require water and therefore are appropriate in areas where there is no adequate water supply
- Alternating double pits will allow the excreta to drain, degrade and transform into a nutrient-rich, safe humic material that can be used to improve soils
- They avoid contamination of surface water and top soil if properly installed and maintained
- They can be constructed with minimum cost using local material and local skills
- The presence of properly constructed slabs will allow easy cleaning and avoid flies and unsightliness

Disadvantages:
• There may be a foul odour from the pit
• These pits can be a favourable place for the breeding of flies and mosquitoes.
• With single pits, a new pit needs to be dug every time the previous one gets full.
• They can be susceptible to failure/overflowing during floods.

Challenges:

• This system is susceptible to non-degradable waste put into the pit.
• Many fear that it might affect the ground water quality. While it is dependent on the soil type and the proximity to a water source, it has been proved by research that if well designed, this might not be the case.\(^9\)

This is operational is PS1.

### 7.1.2 Waterless urinals

![Waterless urinals](image)

How it works:

Designed on two simple principles, this system conserves water while controlling bad odour.

The 2 principles are:

• Urine starts smelling when it doesn't dry and is exposed to moisture
• Oil is lighter than water or urine

A closed piping built correctly to transport urine to the drain without stagnation can by itself reduce the stink of urine. An oil layer in the drain will help contain the odour of urine significantly by creating a layer constantly floating on water and urine.

Costs to build: (3 toilets)

• Urinals – either low cost self-made urinals from 20 litre water cans or standard urinals bought off the shelf at about Rs 1,750 per urinal
• Piping – about Rs 2,000
• Oils – any biodegradable oil or Kerosene\(^10\)

Cost to maintain:

• Ensure that the oil layer in the drain is not washed away during cleaning of the toilets; this can be done by simple and mindful disbursal of water that eventually flows into the drain
• The oil layer in the drain needs regular topping up

\(^9\) [http://ehp.niehs.nih.gov/1206028/]
\(^10\) Whichever is cheaper; please note, both are flammable materials, but the quantity in the drain is limited to be dangerous.
Challenges:

- Any stagnation of urine will smell
- Urinating outside the urinal, in such a manner that the urine is constantly moist will result in a stench
- Wrong oils can jam the sewerage over time due to build-up of fats
- Requires bi-monthly or weekly care

Advantages:

- Conserves water
- Reduces the time taken per person in the toilet.
- Makes toilets usable

Disadvantages:

- Needs care – to ensure no urination outside the toilet, topping up the right oil

GS7 had this system till it was removed during the renovation of the toilet roof.

### 7.1.3 Grey Water Systems

Grey water is any used water apart from the water coming out of a water closet. It could be water from hand wash, washing vessels etc. This water is usable as flush water or to irrigate gardens.

How it works: Sink drains are connected to a separate pipe which passes through a filter and transports the water to the point of use. The filter is a mesh of multiple pore sizes. It can be made from Netlon mesh bought off the shelf from a store rolled into a tight cylinder.

Costs to build: (3 sinks = about Rs 7,500)

- Sinks – off-the-shelf sinks based on cost of the sink (approx. cost Rs 1,300 per sink), or used 20 litre water bottles
- Dustbin before the sink, so that students can empty food waste into the bin rather than the sink (Rs 150)
- Piping – based on length
- Filter – Rs 900
Cost to maintain:

- Filter requires cleaning once in 3 weeks with a detergent (Rs 340/annum)
- Replacement of the mesh filter might cost about Rs 50. (might need replacement once a year)
- Piping if broken

Challenges:

- The mesh needs to be cleaned regularly. It takes about 30 minutes to open, clean, dry (on a hot day) and put back.

Advantages:

- GS7 saw about 400 litres of water being reused in the toilet due to this system.
- This in turn conserved about 200 litres of fresh water used to flush into the toilet.

Disadvantages:

- If filtration is improper, organic matter in the water might start coating the sewerage pipe leading to its jamming.

GS7 has this system. The pipes taking water into the girls' toilet are currently disconnected due to construction happening above its location to prevent damage.

7.1.4 O&M flow chart

How it works: A lot of the O&M works happens based on the discretion of the cleaning staff. In private schools, the supervisor (if there) might bring in a process which has worked for him/her rather than a scientific approach based on analysis of problems. In Government schools, there is limited accountability. Having the process and washing timing planned according to the time of highest usage will help make the usage experience convenient and hassle-free, encouraging more students to use the toilet.

Costs to build: Rs 0

- An analysis on the times of highest usage has to be done, so that the toilet can be cleaned before and after this usage.
- Using a rubber-tipped water pusher to ensure that water doesn’t stagnate, the time taken for the floor to dry has to be measured. Based on this time, the timing of the pre and post usage cleaning has to be adjusted.
- A checklist of responsibilities, or a student led council to check on the cleaning efficiency with parameters decided jointly by staff and students has to be created.
- A “Supervisor” – a formal post has to be created and a teacher appointed. The student led council can report/escalate to this person.
- An escalation pattern, where after a predefined number of defaults in O&M, has to be created, so that the Supervisor can rectify any issues.
- A formal “Complaint box” can be created so that the supervisor is informed of issues regarding O&M that might otherwise go unnoticed.

Cost to maintain: Rs 0

Challenges:

- This is dependent on the Supervisor's capabilities and interest
- The student led council has to judge the O&M only on the basis of predefined factors. These factors in themselves might be biased towards the interests of the supervisors
• The system needs the Supervisor to be empowered to carry out small repairs without being constrained by the fear of non-reimbursement of expenses

Advantages:

• A low cost method of ensuring greater usability of toilets
• An ownership as desired by the SSHE is built into the students without getting them to maintain toilets
• The work and responsibility is equally divided, and all stakeholders are aware of each other’s responsibilities
• In the case of change of the support staff, the Supervisor can inform the new support staff of their roles and responsibilities
• The teacher’s connect with student sanitation issues is strengthened

Disadvantages:

• Heavily dependent on the efficiency of the predefined factors and roles
• Student co-operation is not assured

PS3, PS7, PS8 and PS9 have such a system, but without the student council component. GS4 was offered help to put in place this system, but chose to defer it to the next academic year.

7.1.5 Student Pool

The idea of a ‘Student Pool’ came into being based on the complaint of Government schools that financial resources were limited, and that physical assets like buckets, dustbins got stolen often. It relies on the idea of crowd sourcing surplus materials from the community, involving them in the welfare of their wards.

How it works: A list of consumables needed every month is created along with an approximation of the quantity needed. A publicly visible tracker helps inform the students on the progress of the resource collection. Based on this, the students can contribute resources. The government schools can use this system to involve the community and get more resources for the O&M needs than that can be accommodated by the official Rs 1,500 per annum provided by the Government.

Costs to build: Rs 0

• A list of consumables needed and approximation of the quantity needed has to be made
• It has to be communicated to the students. A month’s pilot will be helpful in convincing the students of the intent and desire of making the sanitation experience better.
• A progress chart publicly tracks progress
• A reward system can be put into place to incentivise donors.

Cost to maintain: 0

Challenges:

• Highly dependent on the school administration’s desire to convince the students
• High on effort initially

Advantages:

• Student ownership increases
• Community involvement increased
• Costs of O&M spent on consumables reduces

Disadvantages:
A monthly cycle – involves effort and resource tracking
Effort to motivate students and the community is high till the precedent has been set
GS4 had this system till it was deferred to restarting the following academic year.

These innovations are common for both private and government schools. They are intended to take the student rating of school toilets from 2 (bad) to 4 (good).

### 7.2 Initiatives

These are initiatives the schools can undertake to increase the overall perception of sanitation ratings. Some of these have been tested in a few schools as pilots.

#### 7.2.1 Design based initiatives

Building on the foundation of the existing sanitary facilities, these are simple modifications which bring the school’s toilets closer to the guidelines of SSA, SSHE or NSSI.

##### 7.2.1.1 Hooks –

As seen in GS7, GS4, PS3, the other 17 of the 20 schools visited didn't have this simple intervention. Even in the case of GS9 which had a new sanitation system built last academic year (Jan 2012), this hasn’t been implemented.

Uses:
- Students and teachers use this to hang newspaper to wrap pads in as shown in the image below
- hang uniform when changing or using toilet

![Hooks Image](image-url)

##### 7.2.1.2 Niches in the wall –

As seen in PS8 and PS9, 18 of the 20 schools didn’t have this facility. Since this involves a minor infrastructural modification, it is easier to nail simple plastic shelves (got off the shelf in stores) into the existing wall.

Uses:
- Students empty their pockets into the niche while squatting
- Women (students and staff) keep pads so that it doesn’t touch the floor

![Niches Image](image-url)

##### 7.2.1.3 Dustbins–

As seen in GS4, PS9, PS8 and PS7, 16 out of 20 schools didn’t have this intervention in every cubicle for girls as shown in the image below. While they had common dustbins for girls, there was none for boys. With girls, there is a lot of shame and awkwardness associated with using

![Dustbins Image](image-url)
the common bins. Many often hide their pads in the toilet before leaving it. With boys, there is no place to throw waste (mostly snack packaging).

Uses:

- Ensure that both have a safe space to dispose their waste.
- Sewage lines might be jammed less often.

7.2.1.4 Soap for hand wash-
As seen in PS9, PS8, PS7 and PS4, 16 out of 20 schools didn’t have soap in their hand wash areas. The schools stated their concern that the students emptied the soap as pranks or took the soap bars home. However, having a soap for the purpose of disinfection during hand wash is important. One suggestion is a used PET bottle based soap water dispenser. A bar of soap can be broken into bits and divided into bottles which are filled $\frac{3}{4}$ with water. A small pin-hole can be made in the cap as shown in the step by step image sequence below to make a simple and affordable soap dispenser

Uses:

- Ensures good hygiene post use of a sanitation facility
- Adds the sanitation experience
7.2.2 **O&M based initiatives**

These are simple additions to the sanitation system which go a long way to bettering the experience of using the toilets.

- **Odonil or such room freshener** – one often hears the complaint of bad odour. This simple step goes a long way to offset this complaint.
- **Door Mats before the main toilet entrance** – another complaint was that when students walked in to a toilet, a lot of sand and grime was carried in, making the toilet look dirty. This will help reduce the problem.
- **Educational posters** – all students felt that some sort of visually appealing educational poster on how to use the toilet or wash one's hands would add to the experience of using the toilet by ensuring better habits.
- **Gap between wall and door** – long term solutions include silicon sealant, cement etc. Students can implement solutions by stuffing waste paper or cloth dipped in Fevicol into the gap and closing it with brown tape.
- **Holes in plastic doors** – A similar approach as suggested above can be implemented for this problem.
7.3 Case Study #1: Benefits of timely maintenance

PS9 has been a visionary school in multiple ways. Since the 1990s, they have had a process flow plan for maintaining usability in toilets, ensuring good sanitation. It was also the only school in the sample to have a pad dispenser and an incinerator.

There are 6 toilet blocks – 2 for staff and 4 for students. Each block has one support staff ensuring its cleanliness apart from their other responsibilities. With the efficient usage of technology (exhaust fans) (15 minutes before the students come, the fans are turned on. They are turned off after the cleaning is done post-student’s use) this is one of the few schools to ensure dry floors. The principal has personally ensured the adherence to this process.

Cleaning process flow:

1. ~9 AM before short break
   • Flooring cleaned with lizol, and exhaust fans used to dry the floor

2. 10 AM post short break
   • Floors cleaned with lizol and dried with exhaust fans, after the students have used the toilets

3. 1 PM post lunch
   • Floors cleaned with lizol and dried with exhaust fans, after the students have used the toilets

4. 2:30 PM post break
   • Floors cleaned with lizol and dried with exhaust fans, after the students have used the toilets

5. 4:15 PM at the end of school day
   • Floors cleaned with lizol and dried with exhaust fans, after the students have used the toilets

Benefits of this system:

- No smell
- Dry floor
- Visibly clean toilets and dustbins
- Assurance and safe environment for the students
- High toilet usage

Costs of the system:

Consumables per annum – Rs 40,000

One time infrastructure expense (fans only) – Rs 1,500 approx

Expenditure on electricity for all 6 blocks per annum (~50w/hr at 4 hours of use per day. 250 working days) Rs 1,800
7.4 Case Study #2: Importance of maintenance

The increased load on water closets (toilets) due to non-maintenance – how the student (girl) to water closet ratio changes

GS4 houses a Pre University College on its campus, both catering only to girls. With a total of about 1,000 girls on campus, the building has a total of 19 toilets across 3 floors. The high school girls total to about 365, the balance coming from the PUC. Using the IS1772:1993 mandated number of 25 girls per urinal, we calculated the number of girls for the installed water closets on campus. With 19 water closets and 1000 girls, the student to toilet ratio came up to 52 girls per toilet. When we visited, only 10 were functional, making the ratio 100:1.

The questionable sanitary habits of the students made fewer toilets usable. The toilet complex on the ground floor had one common dustbin, while the others didn’t have one. As a result, girls were either stuffing their pads into the window sill or trying to flush them, jamming the sewage lines. During a focus group discussion, 60% of the sample admitted to not using the toilet at school. To keep the toilets clean, the school had hired a support staff, paying her Rs 2,000 per month. Apart from being told that she had to keep the toilets clean, no other parameter of cleanliness was fixed.
A large scale intervention was launched:

- the toilets were cleaned
- water leakages were fixed
- non-functional toilets were fixed
  - doors with excess wood, were shaved to prevent jamming
  - broken taps were replaced to push taps (to conserve water)
  - missing jugs were replaced in the toilets to allow access to water
  - dustbins were introduced into every cubicle,
  - latches were fixed where the doors lacked one,
  - hooks were fixed on every door,
  - newspapers were provisioned to wrap pads,
  - an engagement was done to sensitize students on how to use the toilet
  - Taps were fixed, and paint boxes used as jugs in the toilet
The toilet was completely cleaned and doors were shaved off excess wood to ensure they didn’t jam. Latches and hooks were added post this. Sanitary waste was collected and burnt, and bins for collecting sanitary waste in each cubicle was added.

The toilets were then handed over to the school.

- Of the 19 toilets, 15 were made functional up to the satisfaction of the students, taking the student to toilet ratio back up to 66 girls per toilet.
- A "Supervisor" teacher was requested for, and her roles were laid down to ensure that this level of intervention needn’t happen again.
- A student pool was organized for materials, so that the operational cost of the school came down.
- A process to monitor the O&M status of the toilet was suggested to the staffs of the School and PUC.

The management promised that they’d take it up in June. When a visit was made to the school in the subsequent year, the toilets had returned to the original state.

Insights from meeting these stakeholders

- Students– the support staff hired to maintain toilet cleanliness wasn't doing her job. In fact, she wasn't even regular. The students had stopped using the toilets unless it was an emergency.
- Teachers– it was beyond their control as the head of the institution had to hold the staff accountable
- Principal– he couldn’t do so as he had no on-ground information to hold the staff accountable

The reasons for this change were:

- No clear agreement with the support staff on her deliverables or parameters on which her work would be judged. This meant that any default by her in terms of deliverables couldn’t be linked to financial punishments
• A lack of freedom for the school’s second-in-charge to take decisions on the deliverables of the support staff or to hold that person accountable handicapped the school, putting the students’ health at risk
• The lack of delegation of responsibilities amongst the school’s teaching staff meant that no teacher could hold the support staff accountable

Suggestions

• Our suggestions to school administrators and policy makers is:
  • Make it mandatory to put in clear deliverables when it comes to the maintenance of sanitation facilities
  • Fix some clear penalties for default. Ex- 3 reports by students that dustbins are not cleared periodically will earn the support staff a fine of INR 50 or delay payment by 3 days etc.
  • Delegate responsibilities to another teacher in front of the support staff to follow up and ensure adherence to agreed norms
  • Engage students to report data on a set of redefined parameters on a publicly visible chart. Both the teacher and the support staff can follow up on the data reported here

This will ensure at least:

• The limited facilities in a school are fully operational, allowing for their increased utilization
• Students and teachers are abreast on the status of the school’s sanitation
• Students are owners of the state of their sanitation facilities
• The O&M costs for the school come down
8 Conclusion

Simple solutions can take a toilet rated as 2 (poor) all the way to 4 (good). These solutions can help develop positive sanitation habits. Allowing students to take ownership in reporting issues and creating processes for maintenance will solve majority of the non-negotiable issues mentioned by the students. There are certain issues like spacious toilet cubicle etc which need a modification to the very structure, which can be deprioritized by the management. Simpler issues like functional doors, dry floors, clean cubicles, improved access to water etc can be taken up with low budgets. Since implementing solutions for some issues like need for hangers etc can provide an opportunity for skill development, they can even be handed over to students in the form of projects.

1. While the current outlook might look poor in terms of student rating, using the tool to identify major pain points (non-negotiable) and fixing them will increase toilet usage significantly.
2. Processes for maintenance are critical. A complaint center or a friendly teacher coordinator will go a long way to bridge the gap between students and the support staff.
3. Since Government schools get limited funds for maintenance, setting up student pools for simple resources might prove invaluable in improving ownership, involving community and increasing toilet usage.
4. While the SSHE speaks about sanitation education, very few students reported having conversations with their teachers which changed their habits. Having a personal conversation, opening up one’s own experiences about using sanitation facilities, discussing needs and solutions will strengthen habits while reducing costs.

A coordinated effort between the students, teachers, and management is needed to change the current situation of the urban school sanitation. This effort will open up an interesting discussions which not only develop the self, but the larger group directly and society indirectly.
9 Annexure

9.1 Guidelines – WASH

Their guidelines are provided below:

9.1.1 Guideline 1: Water Quality - Water for drinking, cooking, personal hygiene, cleaning and laundry is safe for the purpose intended

Indicators:

- Microbiological quality of drinking-water - Escherichia coli or thermo tolerant coliform bacteria are not detectable in any 100-ml sample.
- Treatment of drinking-water - Drinking-water from unprotected sources is treated to ensure microbiological safety.
- Chemical and radiological quality of drinking-water - Water meets WHO Guidelines for drinking-water quality (WHO, 2004b) or national standards concerning chemical and radiological parameters.
- Acceptability of drinking-water - There are no tastes, odours or colours that would discourage consumption of the water.

9.1.2 Guideline 2 Water quantity

Sufficient water is available at all times for drinking, personal hygiene, food preparation, cleaning and laundry

Indicators for Guideline 2

- Basic quantities of water required.
  - Day schools 5 litres per person per day for all schoolchildren and staff
  - Boarding schools 20 litres per person per day for all residential school children and staff
  - Non-residential schoolchildren and staff 5 litres per person per day
- Additional quantities of water required.
  The following should be added to the basic quantities as necessary. Figures given are for day schools. They should be doubled for boarding schools.
  - Flushing toilets 10–20 litres per person per day for conventional flushing toilets
  - Pour-flush toilets 1.5–3.0 litres per person per day
  - Anal washing 1–2 litres per person per day

The additional water quantities required for sanitation need to be adjusted for local conditions, including the exact type of toilets used (including the use of urinals), prevalent practices, and the length of time that children and staff actually spend in school.

9.1.3 Guideline 3 Water facilities and access to water

Sufficient water-collection points and water-use facilities are available in the school to allow convenient access to, and use of, water for drinking, personal hygiene, food preparation, cleaning and laundry.

Indicators for Guideline 3
- A reliable water point, with soap or a suitable alternative, is available at all the critical points within the school, particularly in toilets and kitchens.
- A reliable drinking-water point is accessible for staff and schoolchildren, including those with disabilities, at all times.
- One shower is available for 20 users in boarding schools (users include school children and residential staff). Separate showers, or separate showering times, are designated for staff and schoolchildren, and separate showers or times are designated for boys and girls. At least one shower should be accessible for females with disabilities and one for males with disabilities.
- Laundry facilities, with soap or detergent and hot water or chlorine solution (or both), are provided in boarding schools.

9.1.4 **Guideline 4 Hygiene promotion**

Correct use and maintenance of water and sanitation facilities is ensured through sustained hygiene promotion. Water and sanitation facilities are used as resources for improved hygiene behaviours.

**Indicators for Guideline 4**

- Hygiene education is included in the school curriculum.
- Positive hygiene behaviours, including correct use and maintenance of facilities, are systematically promoted among staff and schoolchildren.
- Facilities and resources enable staff and schoolchildren to practice behaviours that control disease transmission in an easy and timely way.

9.1.5 **Guideline 5 Toilets**

Sufficient, accessible, private, secure, clean and culturally appropriate toilets are provided for schoolchildren and staff.

**Indicators for Guideline 5**

1. Sufficient toilets are available — one per 25 girls and one for female staff; one toilet plus one urinal (or 50 cm of urinal wall) per 50 boys, and one for male staff.
2. Toilets are easily accessible to all, including staff and children with disabilities — no more than 30 m from all users. Male and female toilets are completely separated.
3. Toilets provide privacy and security.
4. Toilets are appropriate to local cultural and social conditions, are age and gender appropriate and accessible for children with disabilities or suffering from chronic diseases (i.e. toilets are child friendly).
5. Toilets are hygienic to use and easy to clean.
6. Toilets have convenient hand-washing facilities close by.

A cleaning and maintenance routine is in operation, and ensures that clean and functioning toilets are available at all times.

9.2 **Grant Utilization guidelines – SSA**

SSA provides grants to both types of schools—schools run by the Department of Education and schools supported/aided by the Department of Education. All the schools are provided with School grant, Teacher grant for preparation of teaching learning material. In addition the schools of the Department having own building are provided with school grants for repair and maintenance and grant for new Civil works.
9.2.1 **Schools grant:**
School grants are given to all Primary and Upper Primary schools (Government including aided and Local bodies)

- Primary School (class 1 to 5) is considered as one unit and Rs. 5000/- is given as school grant.
- Upper Primary School (class 6 to 7/8) is also considered as one unit and Rs. 7000/- is given as school grant.
- Schools with Primary and Upper Primary classes are considered as two separate units and Rs. 12,000/- is given as school grant.

9.2.1.1 **School grants are utilised for the following activities:**
- For the maintenance of School records and contingency expenditure.
- For the preparation and implementation of School Development Plan (a plan chalked out for the development of the school based on the needs of the school).
- For the preparation of teaching learning materials.
- If there is savings after implementing the above activities, the amount may be used for purchase of Television and Receive Only Terminal (ROT).

9.2.2 **Maintenance grant:**
Maintenance grant is given to all Government Primary and Upper Primary schools including rented and rent free buildings on the basis of number of class rooms in each school. The criteria for allocation of the grant is given in the below table:

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Type of schools</th>
<th>Criteria</th>
<th>Maintenance Grant (Rs) for each school</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LPS (1-5)</td>
<td>schools up to 3 class rooms</td>
<td>5000</td>
</tr>
<tr>
<td>2</td>
<td>UPS (6-7/8)</td>
<td>schools having 4 class rooms</td>
<td>7500</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>schools having 5 and above class rooms</td>
<td>10000</td>
</tr>
<tr>
<td>4</td>
<td>LPS (1-5)</td>
<td>schools up to 3 class rooms</td>
<td>5000</td>
</tr>
<tr>
<td>5</td>
<td>UPS (6-7/8)</td>
<td>schools having 4 class rooms</td>
<td>7500</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>schools having 5 and above class rooms</td>
<td>10000</td>
</tr>
<tr>
<td>7</td>
<td>PS with UPS (1-7/8)</td>
<td>schools up to 3 class rooms</td>
<td>5000</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>schools having 4 class rooms</td>
<td>7500</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>schools having 5 class rooms</td>
<td>10000</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>schools having 6 and 7 class rooms</td>
<td>15000</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>schools having 8 and above class rooms</td>
<td>20000</td>
</tr>
</tbody>
</table>

9.2.2.1 **Maintenance grants are utilised for the following activities:**
For protection of school building and maintenance of the school like whitewashing, minor repair works, preparation of teaching-learning equipments, payment of electricity and
telephone bills, provision of drinking water facility, maintenance of toilets and cleanliness of school and its campus.

If there is savings after implementing the above activities, the amount may be used for installation of incinerators and purchase of sanitary napkins for girl students studying in Higher Primary Schools.

Plans from the SSHE technical manual:

Entry to the girl’s toilet

- In case of non-inclusive toilets (toilets which are not specifically meant for CWSN), the door width may be lesser, as shown, while the hardware and other provisions may be similar to those provided for CWSN.
- The average height of hardware provisions like handle, latch, etc. are nearly same for boys and girls. However, two sets of handles are shown so that it is comfortable for all users (including adults).
- If available, a single longer handle or a vertical grab bar may also be provided instead of two handles.
Girl's Urinal: Provision of door & location of hardware fittings

- Urinal design for girls needs a urinal on the floor with properly sloped impervious floor towards the drain that carries the urine, and wall with impervious surface like ceramic tiles.
- For privacy, it also needs a low height door (1500mm height, as shown) with provisions of hooks to hang any loose clothing if needed to prevent it from soiling on the wet floor.
- The width of 700mm shown in the plan takes into account the clothing that girls usually wear across the country.
- The depth of 800mm takes into account the seating posture and the desired clearance, while economizing the space to the extent possible. It is assumed that adult lady teachers will be using the toilet for urinal purpose.
- The open drain to be 100mm wide so that it can be cleaned periodically. The slope of the floor towards the drain to be ensured.
Boy’s Urinal

Drawing 2.19c. Plan

- Urinal design for boys needs a wall with impervious surface like ceramic tiles for urinating while standing and a properly sloped impervious floor towards the drain that carries the urine.
- The width shown here (450 to 600mm) is for children (450mm) and adult teachers (600mm). Hence while providing urinals, to economize, while most urinals may be 450mm wide, at least one urinal to be 600mm wide.
- The depth of 600mm shown is applicable for all urinals.
- The open drain to be 100mm wide so that it can be cleaned periodically.
Girl’s toilet with Indian squatting pan and provision of incinerator

Drawing 2.22b: Plan

- Toilet designs for girls need special attention. Internal clear size of 1200 x 975mm takes into account the specific needs of the girls.
- There must be a small child accessible niche to keep new sanitary napkins.
- There must be a connection to an external incinerator through a child accessible chute to later incinerate the sanitary napkins.
- The location of incinerator is suggestive and can be adapted to suit different site situations.
- It must be ensured that it is directly accessible through a chute from at least one of the girl’s toilets.
- Provision of an internal hand wash is desirable from hygiene perspective. This must be separate from the tap located near the toilet seat.
- Ventilators must be located such that natural light and ventilation naturally keeps the space dry. See Drawing 2:22b for more details.
- Toilet designs for girls need special attention. There must be a small child accessible niche to keep new sanitary napkins.
- Also, the floor slope must be ensured such that there is no stagnated water or dampness. See Drawing 2:22a for more details.
Boy’s toilet with Indian squatting pan

Drawing 2.23. Plan

- Internal clear size of 1000mm minimum to 1200mm maximum in depth and 900mm to 1000mm is suggested.
- Provision of an internal hand wash is desirable from hygiene perspective. This must be separate from the tap located near the toilet seat.
- Ventilators must be located such that natural light and ventilation naturally keeps the space dry.
The doors for urinals and toilets for boys and girls must have hooks at different heights to hang loose clothes/undergarments for different heights of children (given at heights 1100, 1300 and 1500mm from the floor).

The handles and securing bolt must also be at child accessible height.

The door to have clearance of at least 75mm from floor for longer life as shown. Typically door bottoms get damaged due to continuous dampness/splash of water. This clearance will avoid the damage.

Two sets of handles are shown (at 600 and 1025mm height from the floor) so that it is comfortable for all users (including adults).

If available, a single longer handle or a vertical grab bar may also be provided, instead of two handles.
Child using washbasin for washing hands

Drawing 2.25a. Plan

Drawing 2.25b. Section
Wall integrated sink for washing hands

Typically, the sinks integrated with wall may be more compact and economical in the long run as compared to wash basins. The spacing between the taps (450mm) is less here and the depth (300-375mm) is also less as compared to wash basins.

Drawing 2.26a. Plan

Drawing 2.26b. Section

Taps at multiple height shown here (700, 785, 870mm from the floor where children stand) make the facility accessible and usable to more children and also help in avoiding wastage of water.
Storage to be provided in the toilet blocks

For effective and timely cleaning of toilets, it is important to keep the cleaning reagents, broom, wiper, bucket, etc. ready and accessible for the cleaner, within the vicinity of the toilet block itself.

Appropriate hooks, storage shelves, tap etc. to be provided for this purpose. These are shown here.