NSE Foundation | FINISH Society

Guidebook

for Operations and Maintenance in Schools

ACKNOWLEDGEMENT

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Abbreviation

ABBREVIATION

AMC	Annual Maintenance Contract
IEC	Information Education & Communication
GI	Galvanized Iron
GP	Gram Panchayat
HM	Head Master
LPCD	Litter per capita day
O & M	Operation & Maintenance
SBM-G	Swachh Bharat Mission - Gramin
SMC	School Management Committee
WASH	Water Sanitation & Hygiene

INTRODUCTION

Water, sanitation & hygiene continues to be one of the primary developmental agendas that affect health and well-being of society as well as environment. In its cognizance, Govt. of India launched one of the largest sanitation programs, Swachh Bharat Mission (SBM) in 2014. SBM has witnessed an unprecedented progress since its implementation resulting into increased sanitation coverage across rural India. despite several gains made and results achieved, sustaining this change, remains a challenge. Accelerating access to and use of toilets, and inculcating hygiene practices, including hand washing with soap after using toilet and before meals, continues as a national priority.

Poor sanitation causes health hazards including diarrhoea particularly in children under five years, malnutrition and deficiencies in physical development and cognitive ability. WASH in Schools is essential for promoting the health and well-being of students, and for creating an enabling learning environment. With concerted efforts to ensure that students have access to adequate water, sanitation, and hygiene services, proper maintenance of these facilities is critical to ensure sustained access to and use of such services.

Our Water, sanitation and hygiene (WASH) intervention in schools includes (but not limited to):

- Access to water, sanitation and hygiene infrastructure for all students
- Functional O & M system
- Availability of potable water
- Regular behaviour change communication sessions on WASH

For effective WASH in school programs, three components are crucial:

1. Hardware component
2. Software component
3. Operations and maintenance

All these components are interdependent on each other. Inadequate operation and maintenance (O&M), and in particular, poor capital maintenance (replacement), is a key cause of infrastructure break down.

PURPOSE OF THE DOCUMENT

This manual aims to provide guidance on effective O & M of Water, Hygiene and Sanitation (WASH) infrastructures in government schools. This document can act as a toolkit for school teachers, administrations, and practitioners.

Who can use the document?

- School Teachers/ Head Masters/School administration
- School Management Committees (SMC)
- Gram Panchayats (GP)
- Civil society organizations, other organisation working for O&M, cleaning workers

LIST OF COMMON WASH INFRA STRUCTURES PROVIDED BY FINISH SOCIETY

Toilet & Urinal

- Toilet Block with 1 WC and 3 urinals (both new and upgradation)
- Ceramic Pans for urinals
- Tap connection in toilet block with water storage tank (500 or 1000 litres)
- Provided running water supply in toilet block
- IEC on how to use toilet and its maintenance
- basin with tap for hand washing after toilet use
- Leach pit or septic tank with soak pits for Faecal Sludge Management
- Paver block pathway for easy accessibility
- Ramp and Hand rail for easy accessibility
- Separate doors with latch for toilet and urinals for safety

Hand Wash Station-

- 4 or 6 Tap structure depending on the number of students in the school
- Liquid soap dispenser/ soap
- Different height for taps for accessibility of different age group students
- IEC demonstrating hand washing steps
- Ramp and hand rail for easy access
- Silt chamber with soak pit for waste water management
- GI Roofing- Shade or other roofing
- Overhead tank for water supply

<table>
<tr>
<td>  </td>
<td>Drinking Water Station
• Fabricated steel unit with 3 or more taps if required
• IEC to avoid wastage of water
• Chamber and Soak pit for waste water management
• GI Roofing- Shade
• Ramp and Hand railing for easy access
• Overhead tank for water connection</td>
</tr>
<tr>
<td>Compost Tumbler
• Drum – 100 Lts capacity
• IEC for proper handling of wet waste
• Handle for rotating the drum
• Holes for aeration</td>
<td>  </td>
</tr>
<tr>
<td>  </td>
<td>Evapo-transpiration Technology or Trenching for waste water treatment (depending upon the availability of land and resources
• Wastewater is diverted to trench beds with perforated pipes
• IEC mentioning design, operation & maintenance of the structure
• Plantation over trenches for evaporation
• Percolation via trenches with filter media helps in ground water recharge
• Vent pipe to maintain air pressure</td>
</tr>
</table>

Water Supply Network (RWSN)

Rain Water Harvesting (depending upon availability of space and resources)

- The rainwater from terrace is collected via a piped system leading to ground water recharge.
- Water from the first rains from rooftop is diverted to soak pit through valve to avoid ground water contamination. Afterwards the water is filtered through the silt chamber, and diverted to Hand pump through filter media for ground water recharge.
- IEC mentioning design, operation & maintenance of the structure

OPERATION & MAINTENANCE (O&M)

What is Operations & Maintenance (O&M):

O & Maim to ensure efficiency, effectiveness and sustainability of water supply, sanitation facilities (Castro 2009)[1]. O&M encompasses all of the activities needed to run water supply, sanitation and hygiene facilities, but excludes the construction of new facilities.

Operations: Refers to the direct access to the system by the user, to the activities of any operational staff (e.g. operators of water pumps), and to the rules or policies, which may be devised to govern who may access the system, when, and under what conditions. Operation deals with ensuring daily smooth functioning of the water supply system and other activities associated with it e.g. cost of running the system, water testing, electricity supply for pumps etc.

Maintenance: Refers to the technical activities that are needed to keep the system working. Maintenance requires skills, tools and spare parts[2]. Maintenance deals with upkeep of the facilities or machines, system in good working condition and preventing breakdowns, damages to the facilities or machinery. Maintenance can be classified into three sub-categories:

[1] CASTRO, V. MSUYA, N. MAKOYE, C. (2009): Sustainable Community Management of Urban Water and Sanitation Schemes (A Training Manual). Nairobi: Water and Sanitation Program-Africa, World Bank

[2]CARTER, R. C. (2009): Operation and Maintenance of Rural Water Supplies. In: Perspectives N° 2. St. Gallen: Rural Water Supply Network (RWSN)

- **Preventive or routine maintenance:** It is a routine check of the WASH infrastructure for minor repairs. Under this type of maintenance, monitoring has to be taken as part of precautionary measures. It is essential for upkeep of the system. In schools O&M, this is part of daily, fortnightly and monthly maintenance.
- **Periodic Maintenance:** It covers more major repairs, maintenance work such as replacing the faulty parts, oiling of locomotive parts from skilled personnel. Periodic maintenance may be costly but it is necessary to improve the longevity of the system. In schools O&M, this is part of annual maintenance.
- **Emergency Maintenance (crisis maintenance):** Repair of unexpected damage or breakdown of the system.
- **Corrective Maintenance:** It is about replacing or repairing something that was done incorrectly or that needs to be changed in order to improve.

O & M of WASH infrastructure in schools mostly consists of toilet and urinal blocks, dish wash station, drinking water station, Hand washing station, or water storage tanks.

ADEQUACY NORMS FOR WASH INFRASTRUCTURE IN GOVERNMENT SCHOOLS AS PER SWACHH BHARAT GUIDELINES

Assessment of the existing infrastructure should be done on the basis of adequacy norms for water, sanitation and hygiene in context with school infrastructure which are as below.

Head	Structure/ Unit	Number of students
Sanitation	1 toilet	40 students
	1 urinal	15 students
	Sanitation block (1 toilet-WC , 3 urinals)	40-45 students
Water (drinking)	2-3 litres	per student
Water (personal use)	15-20 litres	per student
Water storage facility	Storage tank with storage capacity of 500 litres per day (lpcd)	
Hand washing	1 tap	10 students

RESIDENTIAL SCHOOLS/ ASHRAMSHALAS

Ashramshalas are residential schools, since a number of children, especially girls, who live in remote parts of the country, miss out on school and education. The objective of the Ashramshalas is to provide free education to every child, along with residential facilities. Each Ashramshala should provide free food, school uniforms, bedding, books and stationery items to every child along with residential facilities. Additionally, the Ashramshala facilities should also include nutritious meals, access to clean drinking water, sanitation and basic health care. So, there will be addition of infrastructure like bathrooms in hostels, cloth Wash station and so the water storage capacity per capita per day will also increase.

ADEQUACY NORMS FOR WASH INFRASTRUCTURE IN ASHRAMSHALAS

Assessment of the existing infrastructure should be done on the basis of adequacy norms for water, sanitation and hygiene in context with Ashramshalas which are as below:

Head	Structure/ Unit	Number of students
Sanitation	1 toilet	20 students
	1 urinal	15 students
	Sanitation block (1 toilet, 3 urinals)	40-45 students
Bathing and washing spaces	1 tap per bathing space	15-20 students
	1 tap for clothes washing station	20-25 students
Water (drinking)	4-6 litres	per residential student
Water (personal use)	135 litres	per residential student
Water storage facility	Storage tank with storage capacity of 135 litres per capita per day (lpcd)	
Hand washing	1 tap	10 students

O & M ISSUES IN SCHOOLS:

Some of the major O&M related challenges that government schools face are:

- Lack of trained personnel to carry out regular minor repairs, particularly related to plumbing and masonry work, results in defunct infrastructure.
- Lapses in cleaning as roles and responsibilities may not be clearly defined or cleaning staff may not be regular.
- Lack of adequate guidance on O&M, in terms of tasks/activities to be undertaken, roles and responsibilities, and oversight mechanisms.
- Lack of separate cleaning staff for boys and girls toilets.
- Overburdened WASH infrastructure as the toilets and water points are not adequate to serve all students.
- Poor quality of existing infrastructure (broken, damaged, overflowing/ blocked/ clogged).
- Water availability leading to non-usage.
- Mishandling of newly constructed infrastructure- left incomplete/ non-functional/ locked due to minor repair works is forcing the infrastructure to become defunct.
- Non adherence to the standard norms on WASH.

ROLE OF SCHOOL AUTHORITY

School management can undertake following measures to improve O&M efficiency:

- Annual Maintenance Contracts (AMCs) can be issued, which will include regular maintenance of facilities, regular supply of cleaning materials, consumables like soap, disinfectants, brooms, brushes, buckets etc.

- The AMC may include identification of repair tasks and arrangement for repair facilities.
- Appointment of trained personnel to carry out minor repair works of masonry, plumbing work
- Appointment of cleaning staff for boys and girls toilet with regular mon itoring.
- Regular/daily inspection of water and sanitation facilities by an appropriate group of persons as appointed by the SMC .

TOOLKIT FOR OPERATIONS AND MAINTENANCE

Sr No	Tools	Sr No	Tools
1	Pipe Wrench	17	1" elbow
2	Adjustable wrench	18	1" Tee
3	Screw Driver Set	19	1" coupling
4	PlasticPush taps	20	1" Ball Valve
5	Plastic Bib Cock	21	Brass Coupling
6	Upvc solution 110 ml	22	Strainer 4"
7	XO blade frame	23	Clamp 1/2"
8	XO blade	24	Clamp 3/4"
9	1/2" elbow	25	Clamp 1"
10	1/2" Tee	26	M-seal (100gm)
11	1/2" coupling	27	Hammer
12	1/2"Ball Valve	28	Chisel
13	3/4" elbow	29	Plastic Conceal cock
14	3/4" Tee	30	Cutting Plier
15	3/4" coupling	31	Nepple 2"
16	3/4" Ball Valve	32	Toolbox

ASSESSING WASH IN SCHOOLS (CAPTURING THE GAPS)

Prior to any improvement, accessing the existing infrastructure of WASH in schools is necessary. For assessment, a checklist, can be used to capture the gaps in WASH Infrastructure, which should contain date, name of the infrastructure; namely toilets, Drinking Water Station, Dish Wash Station et c, and the gaps identified on that particular day should be mentioned. The material required for repairing the gaps should be mentioned.

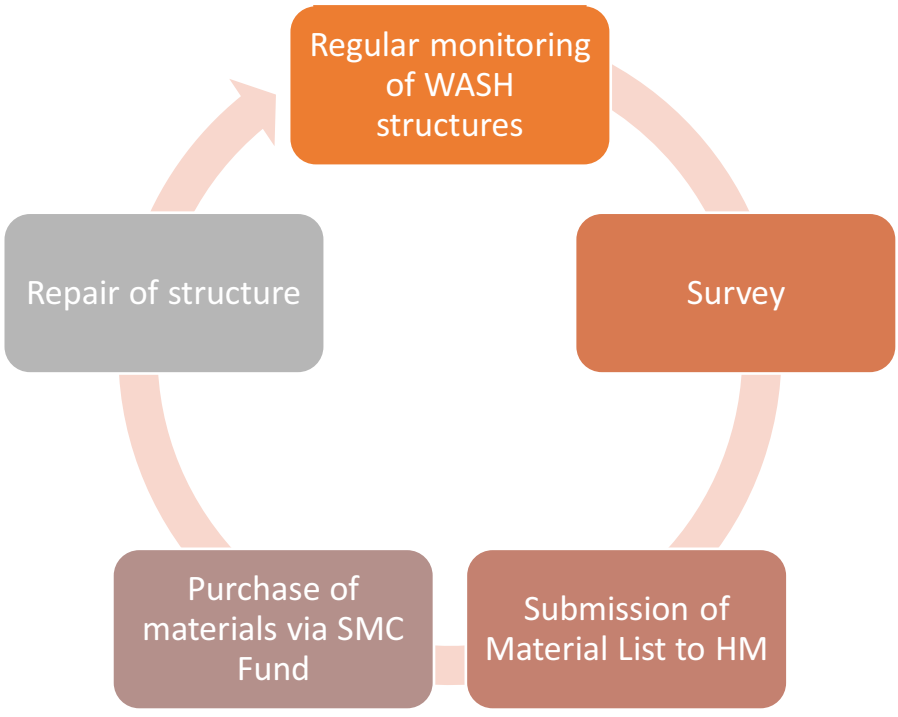
This checklist can be handed over to Head Master/ Principal of the school who can purchase the materials via SMC Fund.

Name of School: **Date:**

Sr.No	Infrastructure	Identified Gaps	Action to be Taken	Material list	Amount	Checklist
						WASH Infrastructure: A) Girls & Boys Toilet B) Girls& Boys Bathroom C) Kitchen area D) DWS/HWS **1.Repair or replacement of -** Defective/ Leaky taps**,** Valves, Flushing cisterns **2. Monitoring of Blockages-** Toilet blockage**,** Open Drain blockage**,** Waste water pipe blockages, urinals and bathroom **3. Monitoring, Cleaning and Maintenance of** Drainage lines**,** Septic tanks**,** Water supply lines**,** Inspection chambers, Water clogging, compost pit, school campus **4. Minor Maintenance-** Door, window of toilets/bathroom, incinerator **5. Electricity-**Toilet, Bathroom, campus
	Total					

Technician Signature **Head Master Seal and Signature**

The process of monitoring visit will be as follows, where the regular monitoring of WASH infrastructure will be done by trained O & M personnel conducting an assessment of the existing infrastructure, finding the gaps and submitting the list required for repair work to the HM. HM after purchasing the mater ials via SMC Fund hands over the material to O & M personnel for repairing of the structures.



O&M TECHNICAL REQUIREMENTS

Cleaning of Water and Sanitation facilities are critical as proper cleaning and preventive maintenance are key components of operation and management of water and sanitation facilities.

Detailed description on cleaning requirements, frequency, methodology, equipment requirement and safety measures are discussed in this chapter to guide school administration and cleaning staff o n day to day cleaning and preventive maintenance of school water and sanitation facilities.

When developing a cleaning and preventive maintenance schedule, the followings should be considered to avoid interruption of sanitation services for school children:

- School toilets should be cleaned at least twice a day, including between peak periods of use (such as mid-morning, after lunch break and end-of-day)
- Not all be cleaned at the same time to ensure adequate access for pupils
- Ensure provision for extra slot of cleaning if needed
- Plan deep cleaning during school holidays by experienced cleaning agent, at least two times a year.
- Sanitary disposal units should be emptied and cleaned sufficiently often by contracted agents.

The timing and frequency of cleaning should be determined by the crowd flow. Cleaning should be done more often during peak hours and less during off-peak hours. Frequency of cleaning is usually determined by expectation and standard of maintenance required by the management of the property and also the budget available for the maintenance of toilets. The following table shows recommended cleaning time, frequency and tools for different components of water and sanitation facilities in schools:

Table 1: Suggested O&M Plan

Sr. No	WASH Infrastructures	Frequency of Operations and Maintenance	Tools
1	Toilet Blocks/ Urinals	**Cleaning**- Twice a day **Blockages-**Occasionally, as an when required **Plumbing –** when required	Disinfectant, broom, Jet sprays (Pressure washers) Elbow, Tee, FTA, couple, joint solution, valve, pipe clamp, XO with frame, M-seal
2	Dish Wash Station/ Drinking water station/ Hand Wash Station	**Cleaning-** Daily **Tap Repairs-** Occasionally, as an when required **Leakages**-Occasionally, as an when required **Blockages due to food particles-** regularly **Broken Tiles-** Occasionally, as an when required	Taps (push cock/bib cock), Teflon tape Chisel, hammer, tiles, grinder, drill machine, cement, measuring tape, trowel, iron pan
3	Electricity in Toilets	Occasionally as an when required	Screw driver, Hammer, wires, holder, electrical switch board, drill machine, Rubber gloves
4	Compost Tumbler	Clean tumbler after completion of two to three cycles	Rubber gloves, broom
5	Evapotranspiration Technology- Trench Method	**Cleaning of Chamber**- once a day **Blockages-**Occasionally, as an when required **Plumbing –** when required	Pickaxe, pipe
6	Rain Water Harvesting	**Cleaning of Chamber**- once in a month **Cleaning of filter media**- once in a year before starting of rainy season **Blockages-**Occasionally, as an when required **Plumbing –** when required	Rubber gloves, broom

MONITORING OF O & M ACTIVITIES

Regular monitoring of O & M of school WASH facilities at all levels (Schools, Ashramshalas, SMC, GP) is very essential to understand gaps and challenges and, to undertake timely repairs and maintenance of WASH facilities.

The school should support O&M by:

- Encourage SMC, teachers, and student committees to form a small sub-committee that can regular monitor O&M and provide feedback to Superintendent and Head Master on a monthly or quarterly basis.
- During SMC meetings, O&M issues, activities must be reviewed. SMC to note action points and review action taken during next meeting.
- Develop an O&M calendar or schedule to facilitate regular inspection and action.

SUSTAINABILITY STRATEGY FOR O & M

- Regular assessment of WASH infrastructures by trained personnel for minor repair works at least in 3 months to ensure that the repair work is carried out timely and no structure remains dysfunctional
- Allocation of cleaning staff with regular monitoring mechanism for checking the status of WASH facilities and report any diversion if any
- Training of cleaning staff if required to handle minor repa ir works
- Leverage bulk buying of consumables required for cleaning

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