Training of Swachhagrahis on ODF Plus: Keeping our Villages Clean

September 2019
Foreword

I am happy to learn that Water and Sanitation Collaborative Council (WSSCC) and Knowledge Links are bringing out a 5-day Training Module and Trainers’ Handbook/Guidance Notes on ODF Plus. I appreciate the initiative and convey my best wishes for its implementation.

Parameswaran Iyer
Preface

Water Supply and Sanitation Collaborative Council (WSSCC) has been providing strategic technical assistance to the Ministry of Drinking Water and Sanitation (MDWS), Government of India (GOI) for the implementation of Swachh Bharat Mission (SBM), which aims at making India clean and open defecation free (ODF) by 2nd October 2019.

WSSCC’s support has been mainly in terms of policy advocacy, action learning and capacity development in the rural sanitation domain of SBM. India has already achieved close to 100% reported sanitation coverage and is moving fast towards an Open Defecation Free (ODF) India.

The current challenges relate to ensuring long term sustainability of ODF results achieved and solid and liquid waste management (SLWM) initiatives for ensuring a clean and open defecation free living environment in the villages of India. Menstrual Hygiene Management (MHM) is another critical area to be focused during this post-ODF phase in most of the states and districts in India.

WSSCC is very happy to design a comprehensive training package including a module and a manual for creating a critical mass of trainers from among Swachhagrahis, the real sanitation foot soldiers on the ground, to provide them need based training support in ODF Plus activities including ODF sustainability (ODF-S), SLWM and MHM.

The training package has been developed in collaboration with Knowledge Links, India, our development partner for this product, which is envisaged to cater to the emerging training needs of the Swachhagrahis across different states and districts in India.

We do hope to be able to make a significant value addition to the capacity development efforts being made at the national level in India for taking the sanitation agenda forward in the country through this training package and its subsequent use on scale across states and districts in India.

Sue Coates
Executive Director ad interim
Water Supply and Sanitation Collaborative Council
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About the Water Supply and Sanitation Collaborative Council
WSSCC is a United Nations-hosted organization dedicated to advancing Sustainable Development Goal (SDG) Target 6.2 on sanitation and hygiene. Established in 1990, WSSCC is devoted to sanitation and hygiene, paying special attention to the needs of women, girls and people in vulnerable situations. In collaboration with members in 150 countries, it advocates for the billions of people worldwide who lack access to adequate and equitable sanitation, shares solutions that empower communities, and operates the Global Sanitation Fund which, since 2008, has committed over US$ 119 million to transform lives in developing countries.

Photos and images: (c) Knowledge Links
Abbreviations

ABHY  Atal Bhujal Yojna
AMI   Anaerobic Microbial Inoculum
ANM   Auxiliary Nurse and Midwife
ASHA  Accredited Social Health Activist
AWC   Anganwadi Centre
AWW   Anganwadi Worker
BOD   Biochemical Oxygen Demand
CAS   Community Approaches to Sanitation
COD   Chemical Oxygen Demand
CSO   Civil Society Organization
CLTS  Community Led Total Sanitation
CRSP  Central Rural Sanitation Program
CSC   Community Sanitary Complex
DDWS  Department of Drinking Water and Sanitation
DEWATS Decentralized Wastewater Treatment Systems
DM    District Magistrate
DWSC  District Water and Sanitation Committee
ECOSAN Ecological Sanitation
FANSA Freshwater Action Network South Asia
FS    Faecal Sludge
FSM   Faecal Sludge Management
FSTP  Faecal Sludge Treatment Plant
GoI   Government of India
GOBAR-DHAN GALVANIZING BIO AGRO RESOURCES-DHAN
GP    Gram Panchayat
GPDP  Gram Panchayat Development Plan
H2S   Hydrogen Sulphide
HDPE  High Density Polyethylene
HH    Household
HRT   Hydraulic Retention Time
IEC   Information, Education and Communication
IHHL  Individual Household Toilet
IPC   Inter Personal Communication
KRC   Knowledge Resource Centre
LNOB  Leave No One Behind
LPG   Liquefied Petroleum Gas
LWM   Liquid Waste Management
MAPET Manual Pit Emptying Technology
MDWS  Ministry of Drinking Water and Sanitation
MGNREGS Mahatma Gandhi National Rural Employment Guarantee Scheme
MHM   Menstrual Health Management
MIS   Management Information System
MJS   Ministry of Jal Shakti
Abbreviations

MIS Management Information System
MJS Ministry of Jal Shakti
MPLADS Member of Parliament Local Area Development Scheme
MLALADS Member of Legislative Assembly Local Area Development Scheme
MRF Material Recovery Facility
NABARD National Bank for Agriculture and Rural Development
NIMBY Not In My Back Yard
O&M Operation & Maintenance
OD Open Defecation
ODF Open Defecation Free
ODF-S Open Defecation Free- Sustainability
ODF-Plus Open Defecation Free- Plus
PCB Pollution Control Board
PDBs Planted Drying Beds
PHC Primary Health Centre
PM Prime Minister
PRIs Panchayati Raj Institutions
PPT PowerPoint Presentation
PVC Polymerizing Vinyl Chloride
PwDs Persons with Disabilities
RCC Reinforced Concrete Cement
SBK Swachh Bharat Kosh
SBM Swachh Bharat Mission
SBM(G)/SBM-G Swachh Bharat Mission (Gramin)
SDG Sustainable Development Goal
SHG Self Help Group
SLRM Solid and Liquid Resource Management
SLWM Solid and Liquid Waste Management
SRM Solid Resource Management
SW Solid Waste
SWM Solid Waste Management
TOT Training of Trainers
TSC Total Sanitation Campaign
UDDT Urine Diverting Dry Toilet
UNICEF United Nations Children’s Fund
WASH Water, Sanitation and Hygiene
WC Water Closet
WHO World Health Organization
WSSCC Water Supply and Sanitation Collaborative Council
Introduction

Swachh Bharat Mission is the biggest people’s movement on sanitation in the world that seeks to create a Clean India. It has captured the imagination of a large section of the population and is being implemented as a mass movement that seeks to engage everyone in a collective quest for cleaning and making Villages, Districts, States and eventually the entire India Clean and Open Defecation Free (ODF) by 2nd October 2019. As close to 100% ODF status in India has already been reported to be achieved, the current focus of the national flagship programme is now on ODF Plus (ODF+), which aims at keeping the villages clean.

ODF Plus, as defined by the Department of Drinking Water and Sanitation, Ministry of Jal Shakti, has the following four components: ODF-S; Solid Waste Management; Liquid Waste Management; and Faecal Sludge Management.

ODF-Sustainability (ODF-S) essentially means no visible faeces in the open, which is critically dependent on sustaining behaviour change which can be achieved by ensuring social, institutional, financial and technological sustainability of ‘No Open Defecation’ behaviour. ODF Plus interventions provide an opportunity to ensure ODF sustainability by engaging with the rural communities in the post ODF period.

Solid Waste Management (SWM) includes GOBAR-DHAN and plastic waste management. Liquid Waste Management (LWM) essentially involves grey water management. And Faecal Sludge Management (FSM) is about managing faecal sludge in an environment friendly manner. Thus, the idea is not only to sustain the ODF status but also to move beyond ODF to ensure visible and veritable cleanliness in villages on a sustained basis.

Swachh Bharat Mission- Gramin (SBM-G) has engaged a large army of foot soldiers known as ‘Swachhagrahis’ who have facilitated activities at the village level to help communities achieve ODF status in their respective villages. They are also responsible for facilitating activities intended for ODF Plus interventions.

The Department of Drinking Water and Sanitation (DDWS), Ministry of Jal Shakti (MJS), Government of India (GoI) has now planned to build capacities of the Swachhagrahis for facilitating ODF Plus activities efficiently in their respective Villages/Gram Panchayats. The government has emphasized upon the need for sustainability of interventions and benefits adequately. ODF Plus advisory has been recently issued by DDWS, MJS to support States and Districts in achieving sustainability of interventions.

This handbook is to help trainers engaged in building capacities of Swachhagrahis (as per training module, which is available as a separate document developed for the purpose) for properly performing their role in ODF Plus interventions. This is also useful for the program managers at block and district levels.
History of Sanitation programmes in India

- The first WASH programme was started in India in 1954 through the first Five-Year Plan.
- The decade of 1981–1990 was celebrated as the Decade of International Sanitation and Drinking Water.
- In 1986, the Government launched the Central Rural Sanitation Programme. Its primary aim was to provide quality life to rural people and to ensure the privacy and dignity of women.
- In 1999, Sampurna Swachhata Abhiyan (Total Sanitation Campaign) was launched. It was a demand-based programme, in which focus was given to information, education and communication activities, human resource development, capacity building and awareness generation.
- In 2012, Nirmal Bharat Abhiyaan was successfully launched. Its main aim was to increase the overall sanitation coverage in rural areas.
- On 2 October 2014, Swachh Bharat Mission-Gramin (Rural) was launched with the aim of making the entire country open defecation free (ODF).

Approach followed and achievements of SBM-G

Swachh Bharat Mission, the PM’s top flagship Clean India Mission, has made sanitation everyone’s business and achieved seemingly impossible targets with bullet speed.

It has established new style of functioning, which challenges established government systems of hierarchy and protocols and is open to try out whatever could be thought to make it truly a ‘Jan Andolan’ (People’s Movement).

The Government of India followed Community Approaches to Sanitation (CAS), which focused on triggering collective behaviour change for achieving ODF villages. For facilitating CAS in villages, trained grassroots level workers (Swachhagrahis) have been engaged. Swachhagrahis in villages and champions at the GP, block and district administrations took a large number of innovative steps to create an enabling environment for making Swachh Bharat a people’s programme. Some of these included ‘Nirmal Prabhat and Gandhigiri’ (community leaders counselling HHs for stopping OD using Gandhian ways of persuasion), ‘Jan Sabha and Mega triggering sessions’ (Mega triggering sessions for different stakeholders including officials, SHGs and other community leaders by DM/senior officers to make their habitation ODF), ‘Chai and ‘Lunch with DM’ (DM taking lunch with leaders of ODF villages), ‘Kachcha Toilet Todo Abhiyan’ (Nigrani Samitis and other community leaders motivating people to break unsafe toilets and build safe toilets), ‘Nirmal Register’ (School, SHG, ICDS Centre, GP to maintain a register recording the HHs using and not using toilets; the register was being updated on a monthly basis), ‘Nirmal Vidyalaya Saptah’ (a week long campaign in all the schools of the district at least once in 6 months), ‘Sanitation Card’ (issued to ODF HHs, which provided them priority in accessing government schemes), ‘Mukti’ (converting OD areas into beautiful places such as parks, playgrounds), ‘Swachhata Matdan’ (secret balloting at village level on a fixed date to find out people going for OD followed by counselling them), ‘Ratri Chaupal’ (Senior officers discussing sanitation issue with community members in late evening informal sessions), ‘Mothers’ meeting at Anganwadi Centres’ (focusing on importance of toilets and safe disposal of child faeces), ‘ODF war room’ (which helped in close monitoring of ODF results at district/block levels),
‘ODF celebrations and Gaurav Yatras’ (Celebrating ODF achievements and recognizing the efforts of natural leaders and champions, which helped in scaling up).

CAS allowed incentives, with flexibility to states and districts on how to use these; intense engagement at Local Self Government, district, state and national levels; and Mega Campaign involving all departments, agencies and celebrities. Therefore, the Government of India’s CAS was not limited to community mobilization but it had a much larger role to play at district, state and national levels.

There are studies/large scale surveys in support of the outcomes in terms of usage of facilities created, health and economic gains.

Some of the impacts of SBM-G as revealed through different studies are as follows:

**Impacts of SBM-G**

- **Financial and Economic Impact**
  - In an Open Defecation Free village, each family saves over Rs. **50,000** per year on account of avoided medical costs, time savings, lives saved.
  - *UNICEF Study, 2017*

- **Impact by way of lives saved**
  - Over **3 lakh** lives saved by 2019 due to improvement in sanitation under the Swachh Bharat Mission.
  - *WHO Study 2018*

- **Health Impact**
  - **46%** higher cases of diarrhoea among children in non-ODF areas
  - *Sanitation Health Impact Assessment Study 2017 by Bill & Melinda Gates Foundation (BMGF)*

- **Impact on gender equality**
  - Reports published by the International Monetary Fund (IMF) in 2017 & 2018
    - 10% reduction in time spent by women involved in household and child care
    - 1.5% increase in the proportion of women in the workforce
Introduction

The primary objective of the SBM (G) was to ensure 100% ODF status across all villages in the country by October 2nd 2019. The goal has been now successfully achieved through rigorous and continuous efforts of each and every stakeholder. Now the need is to climb up the sanitation ladder while sustaining the present status.

What is ODF Plus (ODF +)?

A village is considered Open Defecation Free Plus (ODF +) habitation if it sustains its ODF status and safely manages its solid and liquid wastes.

Key Components of ODF Plus

There are 4 key components of ODF Plus. These include ODF-Sustainability (ODF-S), Solid Waste Management (SWM), Liquid Waste Management (LWM) and Faecal Sludge Management (FSM) as shown in the figure below:

Overview of Key Components of ODF Plus

1. ODF-Sustainability

The key expected outcome of ODF-S is no visible faeces in the village.

The key tasks for this would include:

- Ensuring last mile connectivity by addressing the needs of persons with disabilities (PwDs) and HHs that require retrofitting of toilets.
- Strengthening system of community monitoring to ensure that new social norm of ‘No Open Defecation’ is sustained.
2. Solid Waste Management (SWM)

The key expected outcome of SWM is that village environments have minimal litter.

The key tasks for SWM at village level would include:

- Mandatory waste segregation at source.
- Ensuring treatment of biodegradable waste at HH or village level.
- Collection and storage facility for non-biodegradable waste at village level.
- Linking with scrap dealers till Material Recovery Facility (MRF) becomes available at district/block level.

3. Liquid Waste Management (LWM)

The key expected outcome of LWM is that village environments have minimal stagnation of waste water.

The key tasks for LWM at village level would include:

- Develop a plan with appropriate mix of HH and community leach pit and grey water managemen system such as waste stabilization ponds, reed beds, DEWATs etc.
- Design appropriate drains, short pipes systems for each disposal as per plan above.
- Design and implement all systems with technical support from district engineers.

4. Faecal Sludge Management (FSM)

The key expected outcome of FSM is to protect soil, water and ground water from contamination.

The key tasks for FSM at village level would include:

- Convert single leach pit toilet to twin leach pit toilet or toilet linked with bio gas plant.
- Connect the out flow of septic tank to the leach pit.
- Ensure desludging of septic tank in 3-5 years.

Sources of Funding for ODF Plus Projects

<table>
<thead>
<tr>
<th>Source of Funding</th>
<th>Other Funding Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swachh Bharat Mission (SBM) funds</td>
<td>Corporate Social Responsibility funds</td>
</tr>
<tr>
<td>State scheme funds</td>
<td>Ganga Gram Yojna</td>
</tr>
<tr>
<td>World Bank Performance Incentives</td>
<td>District Mineral Fund</td>
</tr>
<tr>
<td>Member of Parliament Local Area Development Scheme (MPLADS)</td>
<td>RuRBAN Scheme</td>
</tr>
<tr>
<td>Member of Legislative Assembly Local Area Development Scheme</td>
<td>ABHY scheme</td>
</tr>
<tr>
<td>14th Finance Commission Funds</td>
<td>Priority Sector lending from Banks</td>
</tr>
<tr>
<td>State Finance Commission</td>
<td>NABARD</td>
</tr>
<tr>
<td>Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)</td>
<td>Funds under Gram Panchayat Development Plan (GPDP)</td>
</tr>
</tbody>
</table>
ODF-S Objectives

- Maintaining ODF status over continued period of time.
- Continued usage of toilet and hygienic behavior.
- Continued functionality of assets created.
- Decentralized operation and maintenance arrangement of assets.

Key Steps to be undertaken at Village level for ODF-S

1. Last Mile Connectivity & Retrofitting
   - Identify persons with disabilities (Divyang) to make facilities easily accessible to them.
   - Identify households that require retrofitting.
   - Mobilize people for retrofitting of toilets
   - Help in organizing training of masons for retrofitting of toilets as and when required.

2. Community Monitoring
   - Activating Village Nigrani Samiti for periodic monitoring of ODF status.
   - Periodic review of ODF status in GP meetings and facilitate corrective measures.
   - Facilitate community monitoring for regular O&M of institutional and community toilets.
   - Facilitate GP for passing resolution for any new families/HHs to essentially self-construct their toilet.

3. Information, Education and Communication (IEC)

   Ensure dissemination of 5 key IEC messages:
   1. Regular use of toilet
   2. Safe sanitation
   3. Strengthening collective system
   4. Safe disposal of child excreta
   5. Handwashing with soap at critical times

4. Second Verification of each Households (after 6 months of first verification)

Guidelines for second verification of ODF villages has been issued by Government of India on 6th December, 2018. This specifies that a second verification must be carried out after 180 days of the first verification to avoid any slip back and ensure ODF sustainability. The team undertaking the second verification should also include community representatives from the community being verified.
The broad checklist for 2nd verification is as follows:

### Household Survey

<table>
<thead>
<tr>
<th>PARAMETERS</th>
<th>YES (✓)</th>
<th>NO (×)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>All HHs continue to have access to a toilet facility</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>All new HHs in the village that came up post first verification also have access to toilet</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>All HH toilets are functional and safe, with no human contact with faeces</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>All HHs always/regularly use the toilet (100% usage)</td>
<td></td>
</tr>
</tbody>
</table>

All parameters are mandatory

### Village Survey

<table>
<thead>
<tr>
<th>PARAMETERS</th>
<th>AVAILABLE</th>
<th>USED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Visible faeces found in the environment/village</td>
<td></td>
</tr>
<tr>
<td></td>
<td>YES (✓)</td>
<td>NO (×)</td>
</tr>
<tr>
<td>2</td>
<td>Schools have access to safe sanitation and are being used</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Anganwadi Centres have access to safe sanitation and are being used</td>
<td></td>
</tr>
</tbody>
</table>

All parameters are mandatory

### Key Issues and Challenges in the Context of ODF -S

- Keeping the interest of GP and Nigrani committee alive in sustaining the social norm of ‘No Open Defecation’.
- Mobilizing people for retrofitting of toilets.
- Lack of trained masons for retrofitting of toilets.
- People’s expectation for funds from Government for retrofitting of toilets.
- Taboos associated with pit emptying.
- Lack of knowledge about desludging of septic tank periodically.
- Lack of toilets for migrant families and floating population.
- Lack of O&M system of community toilets.
- Lack of facilitation for micro financing through SHGs.
- Availability of water for use of toilet.
- Promote other hygienic behaviors: Handwashing with Soap.
- Disposal of Child excreta.
Introduction

mWater surveyor is an app which can be used for data collection through smart phones and tablets. Survey formats can be designed as per requirement.

The data is uploaded to an online database which will be stored in a mWater cloud a software program that runs on a secure computer network. Now the managers and administrators can access, review and analyses the data on the mWater server/portal. For uploading the data wi fi connection or mobile data (3G & 4G) is required.

Summary of process for ODF Plus assessment

For facilitating ODF Plus assessment, the summary of the process that would be adopted by the facilitator is as follows:

- Facilitate a step by step process of downloading mWater app.
- Explain the process of creating an account on the mWater app by signing up. For this, distribute a format for getting the user name of the participants.
- The facilitator then makes participants enumerators by using the user name chosen by them for all the 4 types (Household, School, AWC and GP) of survey formats.
- Explain all the 4 formats (By displaying it using a LCD projector) and how to fill the answer using mWater app. A copy of sample formats is available as Annex 3 of the training module. Also tell them that the data can be filled offline as well and submit but it will get submitted once the phone internet connectivity is available.
- Inform the participants that mWater has the facility of simultaneously generating report as required and we would be sharing the same once the survey is complete in the forenoon the next day.
- Explain precautions that need to be undertaken while entering data on the mWater survey formats and answer queries of the participants, if any.
Steps

1. Download the Surveyor App
2. Signing up/Creating an account
3. Logging in
4. Conducting Survey
5. Naming and finding draft surveys
6. Online and offline use

Details of the above steps are given below:

Download the Surveyor App

- Visit the Google Play Store and search for mWater.
- Choose mWater Surveyor and press Install.
- Press Accept to allow the app to access the required phone functions.
- Press open once the download is complete.

Signing up/Creating an account

Signup Method 1: Create an mWater account using Sign Up

- Open the Surveyor app and click on Signup.
- Enter your name, username, email address, and a secret password.
- Remember your username is how you will be referred to throughout the system.
- Choose a username that includes your real name so that team members will know who you are when they review your surveys.
- Avoid using generic usernames such as Enumerator01, etc.
Signup Method 2: Create an mWater account using Google

- Click on Login using Google by pressing the google button (this is the same as your gmail account).
- Enter your Google (gmail) address and password, then click on Allow.
- Your Google name and username will be filled in and a mWater username will be suggested. You can change the suggested username (mWater will check to make sure it is available).

Logging in

You can log in with either your username or the email on your account. If you signed up using Google or Facebook, press those buttons to log in.
- You must be online to log in
- Even if you close the app or restart the phone, you will stay logged in

Conducting survey

Always press Sync now on the Home page to make sure you have the latest version of every survey. You do not need to search for forms deployed to you — they will be automatically downloaded.

Start a survey

Press Start a Survey from the Home page, + Add button, or from a site page. Choose the survey from the list.
- Surveys deployed directly to you are shown first.
- mWater standard surveys are shown separately.

Naming and finding draft surveys

mWater automatically saves any survey that you start. If you leave the app and come back, it will be in the Draft Surveys tab.
- Press Save for Later at the bottom of any page.
- Some surveys will ask you to name the draft. If you do not enter one it will be called “Untitled”.
Deleting a survey

Click on Discard at the bottom of any page of a survey to delete it. Deleting a survey cannot be undone.

Surveys

Touch a survey in the list to open.

Draft surveys are responses that have been started but not yet submitted. Note: All drafts are synced while online.

Rejected surveys were submitted but then rejected by an approver. Make revisions and re-submit.

Recently completed surveys have been submitted.

Check for data sync

Data upload includes form responses - mWater always syncs this data first.

Image upload - photos are synced after survey responses.

Offline Sync - includes the latest form versions and site updates.
  • Make sure sync is complete before working offline.
  • Offline sync happens automatically every 20 minutes and when you open the app.

Online and offline use

Survey forms and responses are always kept in sync when online. Remember:
  • The app must be open for sync to work.
  • Sync status can be found on the Home screen.
  • Press Sync now before going offline to make sure forms are up to date.
5 Toilets and Retrofitting

Types of toilets

1. Twin leach pit pour flush toilet
2. Single leach pit pour flush toilet
3. Septic tank
4. Eco San toilet
5. Bio toilet
6. Toilet linked to bio gas plant

1. Twin leach pit pour flush toilets

<table>
<thead>
<tr>
<th>TECHNICAL SPECIFICATIONS</th>
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</thead>
<tbody>
<tr>
<td>Outer Diameter of each pit</td>
<td>1.23 Metre</td>
</tr>
<tr>
<td>Inner Diameter of each pit</td>
<td>1.00 Metre</td>
</tr>
<tr>
<td>Depth of each pit</td>
<td>1.00 Metre</td>
</tr>
<tr>
<td>Size of honeycomb</td>
<td>1 to 2 Inches (As per soil condition)</td>
</tr>
<tr>
<td>Size of junction chamber (inside)</td>
<td>1 ft. x 1 ft.</td>
</tr>
<tr>
<td>Size of junction chamber (outside)</td>
<td>1.5 ft. x 1.5</td>
</tr>
<tr>
<td>Distance between two pits</td>
<td>1 Metre</td>
</tr>
<tr>
<td>Distance from back wall to WC pan</td>
<td>8 Inches</td>
</tr>
</tbody>
</table>
**Twin leach pit pour flush toilets - Components**

**WC pan** – Flush toilet in every way

**Water seal trap** – It prevents the spread of bad odour from the leach pit. It prevents breeding of flies and worms in the leach pit

**Junction chamber** - It discharges the faeces into one pit at a time. Connecting pipe stops sudden blockages

**Discharge pipe** – It discharges the faeces from the junction chamber into the leach pit.

**Leach pit** – It allows leaves liquid and stool to nearby soil of wall of deep chamber. It prevents the spread of bad odour to the surrounding area by absorbing it. It decomposes the faeces.

<table>
<thead>
<tr>
<th>WC PAN</th>
<th>WATER SEAL/P-TRAP</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="WC Pan" /></td>
<td><img src="image2.png" alt="Water Seal/P-Trap" /></td>
</tr>
<tr>
<td>Water seal should be 20 mm for rural pan.</td>
<td>20 MM</td>
</tr>
<tr>
<td><img src="image3.png" alt="WC Pan" /></td>
<td><img src="image4.png" alt="Water Seal/P-Trap" /></td>
</tr>
<tr>
<td>A twin leach pit toilet is more appropriate and economical for villages. Less water is consumed in its usage.</td>
<td>50 MM</td>
</tr>
</tbody>
</table>
2. Septic Tank
### Septic Tank- features

- Septic tank is an underground construction made from bricks, cement and concrete.
- It has two or more chambers which are different from the baffle wall.
- Sewage is disposed and collected in different chambers randomly, and the treated effluents are discharged through the outlet pipe of septic tank. The absorption time is 24–48 hours.
- Faeces and water are stored for some scheduled time, during which the floating solid waste is disposed. Stored dirt and stool flowing on surface is passed through dirt anaerobic digestion.
- For discharging the effluents into the absorption chamber for outlet T 01 meter x 01 meter measurement absorption chamber is made.

### Disadvantages of septic tank

- There is one common problem of safely disposing the septage/sludge. In the absence of safety policy, the sludge is disposed off in open spaces and lower areas. This poses a hazard to health and causes environmental pollution. In comparison to the leach pit which requires lesser treatment, is more efficient, costs lesser and occupies lesser area, the septic tank requires comparatively higher cost.
- The septic tank is unable to bear the sudden increase in sludge as the high flow of sludge may destabilize the stable area, force the solid sludge to discharge from the overflow pipe and cause pollution.

### 3. Bio Toilet

The bio digester technology is an eco-friendly technique for disposing human sludge. There are two components: fermentation tank and cold active anaerobic microbial inoculum (AMI) which is the main material. With the help of both the components, human sludge can be biodegraded at a faster rate.

### Bio Toilet- features

- Sludge/faeces – Human waste is disposed off completely free of charge
- Eco-friendly – Water and biogas disintegrate the solid waste
- There is no need of costly waste treatment
- The clear water flow that is discharged from the bio toilet is colourless, odourless and without solid particles
- There is no multiplication of bio inoculum
- It is easy to transport from any area
4. Eco san Toilet

Eco san or ecological sanitation toilet or urine-diverting dry toilet (UDDT) is a concept where all waste generated by human beings is treated and disposed of in such a way that it does not harm the environment.

The additional waste is converted into profitable products such as manure and bio-gas.

**Eco san toilet- features**

- The UDDT toilet is built in such a way that urine is drained out and collected in the front area, whereas the sludge is drained out from the back through a large hole and collected in a pit.
- The toilet has three holes to separate the clear water from the urine, and the sludge is flushed out through the third hole.
- It is important that the dried-up sludge and faeces are separated. When the toilet is cleaned with water, it is ensured that the faeces is not mixed with water.
- The urine and faeces can be separated by the pedestal and squat slab.
- Collection and storage /on the basis of treatment technology, lime, ashes or dry material should be connected to the rear hole after debris.
- It is important that two pits are separated completely so that the faeces do not come to the front – only the urine is collected in the front and not flushed down the dry area of the toilet.
5. Toilet linked to Biogas plant

Biogas plants attached to toilets produce a higher rate of biogas compared to that not linked with a toilet. The rate of biogas production varies with the number of toilet users and the quantum of cow dung and human waste.

Retrofitting

Retrofitting is an action or measure to address the technological gap which is affecting its functionality and excreta management process including its sanitary status, and to help the user to use the toilet for ending open defecation.

Why Retrofitting of toilets is necessary?

- Regular use of toilet can be ensured only when quality of construction is maintained.
- Good quality construction can ensure appropriate management of excreta and can also sustain for longer duration.
- Good quality construction is one having pit/tank which efficiently treats human excreta without polluting ground water and a superstructure which protects human dignity and survives adversities of all seasons.
Common defects in toilet construction

It has been observed that there are many toilets in rural areas which are technically inappropriate. Many toilets have pits, pipes, junction chambers and pit covers that are constructed and installed incorrectly; poor plinth foundation; construction of toilets too close to the water source within a distance of less than 10 metres.

Common defects in toilets or given in the tables below:

<table>
<thead>
<tr>
<th>SUB STRUCTURE DEFECTS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Single pit</td>
<td>Poor quality junction chamber</td>
</tr>
<tr>
<td>Wrong pit under upper room</td>
<td>Incorrect angle of toilet pan trap</td>
</tr>
<tr>
<td>IHHL from shared pits to address space constraint</td>
<td>Toilet above the pit</td>
</tr>
<tr>
<td>Twin pits too close to each other</td>
<td>Honeycombing too big in each layer</td>
</tr>
<tr>
<td>Leach pit too close to drinking water source</td>
<td>Pit toilets with vent pipes</td>
</tr>
<tr>
<td>Pits too deep (deep more than 1 meter)</td>
<td>Poor quality of squatting platform</td>
</tr>
<tr>
<td>The pit in use is cemented at the bottom</td>
<td>Foot rest fixed inappropriately</td>
</tr>
<tr>
<td>Leach pit without holes</td>
<td>Septic tank without leach pit</td>
</tr>
<tr>
<td>No space for second pit</td>
<td>Twin pit toilet in high water table area</td>
</tr>
<tr>
<td>Single pit with no junction chamber</td>
<td>Optional toilet cleaning agent</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUPER STRUCTURE DEFECTS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No superstructure</td>
<td>No ventilation</td>
</tr>
<tr>
<td>Temporary superstructure</td>
<td>Wall close to squatting pan</td>
</tr>
<tr>
<td>Small room</td>
<td>Weak or damaged superstructure</td>
</tr>
</tbody>
</table>

Pores in each layers, shallow pit, too close to the structure.  
Honey combing too big & in each layer.
<table>
<thead>
<tr>
<th>Faulty plinth work &amp; pan trap fitting.</th>
<th>Absence of Y junction, incomplete super structure.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pits too close to each other.</td>
<td>Pit very close to drinking water source.</td>
</tr>
</tbody>
</table>
Technical differences /aberrations/ defects/problem (Technological gap) and possible solutions

Problem 1: Single pit with junction chamber (Pit in use)

Possible Solution

**SITUATION 1**

In case junction chamber has two pipes (one connected to the pit in use and the other pipe is small but blocked and can be extended to the pit by using additional pipe), the second pit can be constructed at the distance of 1 metre from the first pit. This pit would be connected with the junction chamber by extending the pipe. The flow of excreta to the second pit is already blocked.

**SITUATION 2**

- In case the junction chamber does not have the provision of pipe to the second pit, stops using the toilet for two days. During this period, use the neighbours’ toilets.
- Flush the toilet completely with water, so that traces of faeces in the pan or pipe are removed properly.
- The second pit (1 metre x 1 metre) should be built at a distance of 1 metre away from the first pit.
- Connect the second pit with the junction chamber and block its use, and start the use of the first pit again.

Problem 2: Single pit without Junction chamber

Possible Solution

**SITUATION 1**  
*If the pit is in use:*

- The pan should be flushed properly with water so that no trace of faeces is left on the pan or pipe.
- During this period, all household members should use their neighbours’ toilet for 2 days.
- The second leach pit should be constructed at a distance of 1 metre away from the first pit.
- The pipe attached to the first pit can be cut up to 1 ft. (up to 5 inches from the rear wall of the toilet). Ensure that the Y-junction is 1 ft x 1 ft size from inside. Both pits should be connected to the Y-junction with a pipe (4 inch) with a 1:10 slope.

**SITUATION 2**  
*If the pit is not in use:*

- The second leach pit (1 meter x 1 meter) should be constructed at a distance of 1 metre away from the first pit.
- The Y-junction should be constructed, and both pits should be connected to the junction with the help of pipes with a 1:10 slope.
Problem 3: No junction chamber & two pits are joined one with the other

Possible Solution

The pipes joining both the pits may be cut near the outer wall and holes in the wall may be cemented from both sides of the wall (if pit is not in use) or from outside (if pit is in use). A junction chamber is constructed near the wall with inner size of 1 ft. in length & 1 ft. in breadth and 6 inches to 8 inches in depth and Y shape in the chamber & distance of 4 inches between two pipes inside the chamber and pipes fitted at 1:10 slope with 6 inches inside the wall of the two pits.

Problem 4: Toilet above the pit (with or without water seal)

Possible Solution

Once the pit is filled & excreta emptied (after 1 year duration from filling of the pit), the pit should be filled with soil and a pan & pan trap installed by breaking the platform and form the bottom of pan trap pipe (4 inches) is allayed on the other side of bottom of toilet wall and junction chamber is built alongside the bottom of wall on the other side of wall and from Y-junction is linked with two leach pits (if space is limited, one pit is made & divided by sealed wall (extended by 1 feet beyond walls around) & linked to junction chamber.
Problem 5: IHHL from shared pits to address space constraint

Possible Solution
- In case of space constraint, one or more houses can be connected to share a pit through Y junction; there should be sufficient space to connect one or more pipes.
- It should be ensured that all houses use one pit at a time and use less water for flushing.
- No acid products should be used for cleaning the toilet. Just clean with ash, lime and salt water.

Problem 6: Twin pits too close to each other

Possible Solution

**OPTION 1**
- Construct a wall (5 inches thick) in between the two pits (length of wall = diameter of pit; depth of wall = depth of pit)

**OPTION 2**
- Plaster the inner surface of the pit wall of the ‘not in use’ (empty) pit
- Stop using the first pit when it is full; Then open the second pit and divert the flow of faeces to the second pit
- For decomposition, leave the faeces in the first pit for a year.
- After decomposition, empty the first pit.
- Plaster the inner wall of the first pit adjacent to the other pit.
Problem 7: Leach pits too close to drinking water source

Possible Solution

- The distance of water sources should be ideally 10-15 meter away from leach pit toilets.
- Ideally, transfer the source of water to a safe distance.
- If it not possible to transfer the water source, outer wall of used toilet and both sides of the wall of un-used toilets towards the side of the water source should be cemented.

Problem 8: Pits too deep (deep more than 1 feet)

Possible Solution

- Development of pathogens (bacteria) and work system is affected in a pit with a depth of more than 1 metre.
- A deep pit pollutes the ground water.
- Construction of a deep pit should be avoided. A separate leach pit (1 metre x 1 metre) should be constructed near the current pit with a junction chamber connecting the superstructure. The new pit can be used immediately.
- Either the deep pit left unused can be filled with soil up to 1 metre and connected to the junction chamber with a pipe (4 inch) or the second leach pit can be constructed at a minimum distance of 1 metre from the first pit.

Problem 9: Leach pit without holes

Possible Solution

<table>
<thead>
<tr>
<th>SITUATION 1</th>
<th>In case pits are not having holes &amp; are not in use:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Holes (of 1-1.5 inches) should be made in both the pits after every layer (excluding two layers at the top and bottom) and bottom should be unsealed (if it is cemented).</td>
</tr>
<tr>
<td></td>
<td>• In case the pit is completely plastered, the holes can be made (by using chisel or drill machine) on walls and on bottom so that the pit is converted into leach pit.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SITUATION 2</th>
<th>If one pit is in use:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• If both pits are without holes and one is in use, then the second pit can be modified and holes made. In the first pit, dry waste can be kept for further drying. After one year, it should be emptied and the above mentioned holes should be made.</td>
</tr>
</tbody>
</table>
Problem 10: No space for second pit

Possible Solution

- Single pit (circular or rectangular) can be made where the width can be increased but the depth should be exactly 1 metre.
- In order to separate the two pits, a brick wall should be constructed in between the pits and cemented on both sides of the wall. To check the water seepage from one pit to the other pit, the wall plinth should be 1 ft. below the ground.
- If there is no sufficient space available, the location of the pit can be changed based on the availability of space. Some options are given below in the following diagrams:

Problem 11: Poor quality junction chamber/broken junction chamber

Possible Solution

As junction chamber is critical for sustainability with inner dimension of 1 ft. length & breadth and depth of 6-8 inches Y-shape junction chamber is made with two pipes (4 inches diameter) emerging from two corners of the junction chamber. Distance between 2 pipes is 4 inches within the chamber.
Problem 12: Incorrect angle of toilet pan trap

Possible Solution

- A water seal of 20 mm (for village pan) and 50 mm (for commercial pan) should be put in the pan trap.
- The pan trap should be repaired and proper water seal should be examined.

Problem 13: Honey combing too big and in each layer

Possible Solution

<table>
<thead>
<tr>
<th>SITUATION 1</th>
<th>If the pits are not in use:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Size of holes to be narrowed down by using brick masonry. Size of holes should not be more than 2 inches.</td>
<td></td>
</tr>
<tr>
<td>- It should be kept in alternate layers except two rows in the bottom and top which need to be sealed.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SITUATION 2</th>
<th>If one pit is in use:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The second pit can be modified and flow should be directed to the second pit once the first pit is full.</td>
<td></td>
</tr>
<tr>
<td>- For decomposition, leave the faeces in the first pit for a year.</td>
<td></td>
</tr>
<tr>
<td>- After decomposition, empty the first pit and modify it.</td>
<td></td>
</tr>
</tbody>
</table>
Problem 14: Choked pipes

Possible Solution

If the pipe from Y-junction to single pit or twin pits is chocked with solidified excreta, the blockage can be removed by repeated flushing of bucket full of water. However, if the pipe is blocked with some materials, after flushing buckets of water an iron rod may be inserted from the side of Y-junction and pushed towards the side of pit, the solid materials would likely to be removed and fall inside the pit.

In case after repeated flushing of water and pushing solid materials by inserting & pushing a rod inside the pit, the issue of choked pipes is not solved, then the pipe is to be replaced by a new pipe.

Problem 15: Pit toilet with vent pipe

Possible Solution

Cut the pipe and seal the hole properly with cement and ballast. Vent pipe is not required in leach pit toilets for the following reasons:

1. The gases produced during decomposition in the pit are absorbed by the soil around the pit through holes and the odour is released.
2. There is no need for a vent pipe. It provides a secure place for flies and mosquitoes to reproduce.

Vent pipe is required in septic tank, as the tank is plastered and it cannot absorb the gases.

Problem 16: Broken pan

Possible Solution

If the pan is broken or damaged, the platform needs to be broken for 6 inches soil below dug to the level up to 6 inches below the level of pan trap. If the pan trap is intact and not damaged, pan is removed by breaking from the top of pan trap carefully, so that pan trap is not damaged.

If the pan trap is also damaged or blocked due to deposition of broken pieces of pan in pan trap and cannot be cleared, the pan trap should also be replaced. The broken pan trap should be de-linked from the pipe leading to other side of the wall to Y-Junction (in twin pit toilets) and pits (in single pit or septic tank) and pan trap with pan above it should be fitted maintaining 1:10 slope of pipe to Y-Junction or pit/tank.
Problem 17: Poor quality of squatting platform

Possible Solution
Improve the quality and leveling of squatting platform by required plastering etc.

Problem 18: Broken doors/walls/roof etc.

Possible Solution
Unless privacy is not intruded due to some damage and the toilets are in use the issue is not big.

However, door can be got repaired or replaced with low cost materials like tin sheet of oil's container fitted on bamboo or wooden frame. Similarly, roof may be repaired or reconstructed with tiles or thatch of paddy or wheat straw.

If wall is damaged, it may be repaired by using cement & sand by household himself or by hiring a mason.

Problem 19: Foot rests fixed inappropriately

Possible Solution
Remove the footrests and fix them at appropriate place with proper alignment.
Problem 20: Constructing a leach pit in a septic tank without leach pit

Possible Solution
Stop the flow of drainage water/sewage of septic tank into the open drain.

This is against the law as it causes water pollution and spreads several fatal diseases. Instead, use a soak pit or leach pit of appropriate size to destroy the effluents.

Problem 21: Twin pit toilet in high water table area

Possible Solution
In a high water table area, the pit should be 300 mm above the ground. Near the pit of up to 1 metre distance, it should be completely filled with soil from the bottom to the top. While making the elevated pit, the toilet floor should also be at an elevated level.

Other optional technologies:

• **Bio toilet** – This toilet is a mechanized defecation system which uses special high-grade bacteria (aerobic and anaerobic) and converts human faeces into methane, carbon dioxide gas and water through the digester tank.

• **Eco san toilet** – This toilet decomposes the generated waste. In this, human faeces, urine and waste water are separated, and dry decomposition of stool is possible. In eco san toilets, all types of waste materials are separated and a specially designed toilet pan is used. Maintaining dry generation and making its decomposition possible is an important aspect of this technique.
Problem 22: Optional toilet cleaning agents

Possible Solution

- Use lemon powder / ash / salt instead of acid for cleaning.
- Clean the WC pan regularly with broom and little water

Operation and maintenance of Leach pit toilet

Operation and Maintenance – Raise awareness about proper operation and maintenance (O&M) of toilets including correct ways of emptying compost toilet pits by the members of the households themselves.

Periodical Maintenance

In the initial period of use observe all components and their functioning carefully. If you come across any construction defect or malfunctioning like small leakage, blockage etc. contact the concerned certified mason agency or government representative and get it rectified soon.

- Don’t throw objects like house sweeping, rags, sanitary napkins, stones etc. in the toilet. It blocks the water seal trap and pan.
- If any such object drops inside, remove it with the help of a wire hook or a bamboo strip.
- If there is a blockage in the pipeline it can be removed from the chamber.
- Don’t bathe in the toilet. This will hamper the entire process in the leach pit. Similarly do not do not allow any extra water such as rainwater, kitchen water etc. into the toilet.
- Don’t smoke inside the toilet (in fact don’t smoke at all) or do not throw cigarette / bidi stubs into the pan.
- Don’t let the cover be uncovered. Level up the earth filling over it periodically.
Tips for Daily Use

The users (all the members of the family) should be informed and made aware about the proper way of using their toilet. Here are some tips:

- Keep sufficient water stored near the toilet so that every user can get required quantity at any time.
- The bucket or a tumbler to be kept inside the toilet should not be more than 2'lt capacity. This is to avoid unnecessary wastage of water.
- If a tap is provided inside the toilet the tumbler should be of still less a capacity say only half a liter. In this case make it doubly sure that the users are aware of judicious use of water.
- Pour a little quantity of water into the pan before use so that the excreta do not stick to the pan.
- Flush the pan with required quantity of water after defecation.
- It is a very wrong practice to flush bucket after bucket to remove a very small particle of excreta stuck to the pan. Use of a long handled brush helps a lot. It saves water and at the same time gives more cleanliness with less effort.
- Clean the pan and the platform around it with water and soft brush once in a day. If need be mild, acid free cleansers may be used to remove stains. Lime powder also works well. Don’t use strong detergents / acids because they kill the microbes in the leach pit responsible for conversion of excreta into manure.
- Operation & maintenance of toilets in institutional buildings viz. schools, AWCs, PHCs, community toilets & sanitary complexes.

Methodology for pit emptying

- One year after the changeover of pits, the first pit is ready for emptying.
- The right time to take out the manure is April-May or December-January.
- First of all, remove the cover of filled leach pit.
- Observe the manure carefully.
- If there are any roots of nearby tree found grown in the pit, remove the same.
- Take out the manure with a spade and a basket.
- As the level of manure goes down, one cannot remove it from above. One can safely get inside the pit and remove the manure. Do not forget to wear proper shoes while doing so.
- Sometimes the lower most portions may be wet. However this is not harmful. You can take the same out or let it dry by keeping the pit open for 1-2 days.
- Fix the pit lid properly after emptying and spread soil over it.

Regular Maintenance of Septic Tank

- Use bleach based mixture for cleaning the toilet pan.
- Use a brush having two side bristles for cleaning the toilet pan.
- Make sure that water from bathroom, domestic water and rainwater does not enter the septic tank.
- Cover the vent cap with a net to prevent mosquitoes from entering the tank, which can cause further increase in number of mosquitoes.
- The septic tank needs to be desludged every 2-3 years based on the number of users and size of tank.
- Sludge pump/vacuum pump is necessary for desludging. Such facilities are not available in rural areas as they are costly. Technologies like gulper, MAPET are available in market and can be used for emptying septic tanks. A Vacuum pump may be purchased if the number of septic tank type toilets are higher of septic tank type toilets are high.
Repair & Maintenance of community / school toilets

In the case of community / school toilets, it is good to have the responsibilities scheduled as presented below.

<table>
<thead>
<tr>
<th>Task</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repair doors, if they do not lock properly</td>
<td></td>
</tr>
<tr>
<td>If vent pipe is blocked pour water down through it to remove spider webs</td>
<td></td>
</tr>
<tr>
<td>Check the condition of the superstructure for cracks on the walls and floors</td>
<td></td>
</tr>
<tr>
<td>Repair the cracks in the walls and floor</td>
<td></td>
</tr>
<tr>
<td>Check the condition of the roof</td>
<td></td>
</tr>
<tr>
<td>Repair the roof, if required</td>
<td></td>
</tr>
<tr>
<td>Check that the vent pipe and fly screen are intact</td>
<td></td>
</tr>
<tr>
<td>Repair the vent pipe and fly screen /mesh</td>
<td></td>
</tr>
<tr>
<td>Check for any loose soil around the foundation of the latrine –refill and compact the soil</td>
<td></td>
</tr>
<tr>
<td>Check whether latrine pit is full</td>
<td></td>
</tr>
<tr>
<td>De-sludge of latrines / empty the Pits</td>
<td></td>
</tr>
</tbody>
</table>
Toilets for Persons with Disabilities (PwDs)

Introduction

The Rights of Persons with Disabilities Act, 2016 defines a person with disability (PwD) as ‘a person with long term physical, mental, intellectual or sensory impairment which in interaction with barriers, hinders full and effective participation in society equally with others’ and lists 21 types of disabilities.

The Department of Drinking Water and Sanitation, Ministry of Jal Shakti, envisages equitable and inclusive access to sanitation facilities for Persons with Disabilities, as an integral aspect of their empowerment to lead a life with dignity.

- According to Census 2011, 2.21% (26.81 million) of India’s population are persons with disabilities. However, the actual number would be much higher, since this did not cover the additional categories of disabilities added in the Rights of Persons with Disabilities Act, 2016
- World Bank estimates between 40 to 90 million persons with disabilities in India

Designing and implementing HH sanitation for persons with disabilities (PwDs)

- Consult disabled people to understand the barriers to access and informed choice of technology options.
- Design and construct facilities that are accessible for all.
- Adapt and modify existing facilities to improve accessibility.
- Provide assistive devices to individuals to enable them to access existing facilities.
## Suggestions for Design Considerations/Solutions for Accessible Sanitation*

<table>
<thead>
<tr>
<th>Type of Disability</th>
<th>Identified Difficulties Faced in Accessing/Using Toilets</th>
<th>Examples of Design Considerations/ Solutions Being Envisaged</th>
</tr>
</thead>
</table>
| Physical disability/mobility impairments (such as Cerebral Palsy, Locomotor Disability, Muscular, Dystrophy, Multiple Sclerosis, etc.) | • Difficulties in maintaining balance  
• Difficulties in squatting, getting up and/or turning  
• Difficulty in finding and/or holding objects such as doorknob, water container etc.  
• Extreme pain while movement | • Path leading to toilets smooth and free of barriers  
• Handrail along path for support  
• Ramps with adequate slope  
• Floor made of non-slippery material  
• Toilet entrance adequate for wheelchair to enter  
• Toilet cubicle space adequate for a person with a wheelchair to move and close door comfortably  
• Handrail/grab bar inside toilet cubicle  
• Raised seat  
• Height/level of fixtures adjusted as per requirement  
• Modifications in the door to ensure privacy and ease of use |
| Vision impairments (blindness or low vision) | • Difficulty in finding path  
• Difficulty in maintaining balance  
• Difficulty in finding and/or holding objects such as doorknob, water container etc. | • Landmark posts/guide string along the path leading to toilet  
• Handrail/grab bar inside toilet cubicle  
• Floor made of non-slippery material  
• Toilet and area outside toilet well illuminated  
• Adequate colour/tonal contrast between walls floor and fixtures |
| Intellectual disabilities or sensory impairments | • Sensitivity to sight/smell  
• Fear in dark/closed space | • Adequate space and ventilation in toilets  
• Toilet and area outside the toilet well illuminated |

Elderly persons also face similar barriers and difficulties, for which suitable design/ modification of toilets is advised. Short-term arrangements can also be made for enhancing accessibility for pregnant women.

*This list does not cover all types of disabilities and specific challenges.
## Making facilities physically accessible

### PATHS

Guide string from house to latrine.

![Guide string from house to latrine.](image)

- Level, marked paths. A firm even path clear of hazards benefits everyone, not only wheelchair and crutch users.

### RAMPS

Ramps or low steps with handrail to the latrine entrance.

![Ramps or low steps with handrail to the latrine entrance.](image)

- Low gradient concrete ramp with raised sides for safety (measurement 1:12 or more)
- Moveable wooden ramp for wheelchair to access facilities steps.

### STEPS

Low concrete steps with cross-hatching to reduce the risk of slipping.

![Low concrete steps with cross-hatching to reduce the risk of slipping.](image)

### ENTRANCES

Wide entrances to toilets and enough space inside for a person and her/his carer to turn inside.

![Wide entrances to toilets and enough space inside for a person and her/his carer to turn inside.](image)

### DOORS

Outward-opening door.

![Outward-opening door.](image)

- Outward-opening tin door on wooden frame. Raised platform edge acts as a door step.
- Outward-opening wooden double doors with a latch on outside to keep closed.
### DOOR HANDLES
Door handles and locks that can be easily reached by all.

- Horizontal handrail the full width of the door on the inside Internal bolt.
- Wide entrances to toilets and enough space inside for a person and her/his carer to turn inside.
- Metal hook and eye on inside of door.

### SEATS
Simple handrails and movable toilet seats that can be placed over pit latrines.

- Painted wooden chair with ‘potty’ inserted in hole in seat. Potty is removed for emptying.
- Metal commode chair with plastic inset toilet pan. Container is placed beneath the seat and emptied into the latrine.
- Low wooden or bamboo toilet stool with hole in seat, placed over toilet hole, with or without funnel as a splash guard. Standard varnished wooden chair with hole cut in the seat.

### HANDRAILS
Handrails

- Bricks protruding from wall for support to a weak or visually impaired person.
- Wooden/bamboo support rails fixed to floor either in front or on either side of toilet (depending on user’s needs).
- Metal bars (e.g. galvanized iron pipe) fixed to side wall/s of latrine.
Solid Waste Management (SWM)

What is Solid Waste?

Solid waste is garbage from households, Institutions, commercial and industrial establishments. Solid waste can be classified as shown in the figure below.

Solid Waste

<table>
<thead>
<tr>
<th>Biodegradable</th>
<th>Non-Biodegradable</th>
<th>Hazardous*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetable, Cattle dung, Garden and food leftover, Agriculture waste</td>
<td>Recyclable</td>
<td>Non-recyclable</td>
</tr>
<tr>
<td>Paper, plastic, metal and glass</td>
<td>Multi-layer packing, Thermocol, Fibre Reinforced Plastic, tetra pack, rubber etc.</td>
<td>Menstrual pads, CFL, batteries etc.</td>
</tr>
</tbody>
</table>

*Collected along with Non-biodegradable waste

Basic principles of Solid Waste Management

Principle 1: 4Rs: Reduce Reuse Recycle Recover

Reduce: Alteration in lifestyle to minimize waste generation

Reuse: Making secondary use of different articles/objects

Recycle: Converting the recyclable solid waste into other useful products

Recover: Useful items are recovered from wastes for further use.

All we need is to bring a small change in our daily lifestyle to reduce waste we generate.

One more ‘R’ i.e. Refuse has now been added, which is basically part of ‘Reduce’ to emphasize the need of saying ‘no to plastics and use and throw items’.

It is important to understand how to incorporate these 4 R principles in our daily life. These are not difficult to implement.
**Principle 2: Segregation at source**

Storage has to be done of biodegradable (organic), non-biodegradable (inorganic) & hazardous solid waste in separate bins. This will facilitate handling & recycling of SW at minimum labour and cost.

![Image of bin types](image)

**Principle 3: Different treatments for different types of Solid Wastes**

Applying techniques to suit the given types of solid waste e.g. Biodegradable solid waste only can be composted using different methods or anaerobically treated in a biogas plant. Paper, cloth can be recycled in the village whereas glass, metal, plastic can be recycled only at some designated industries.

**Principle 4: Treatment at nearest possible point**

The best choice for composting and treatment would be at nearest point and decentralized.

**Principle 5: Cyclic Management instead of Linear Disposal**

Generally, we find NIMBY (Not in My Backyard) syndrome in dealing with solid waste as shown in the figure below:

The desired approach needs to be cyclic management, as shown in the figure below:

Solid waste should be viewed as an asset and not as a problem. Greater emphasis should be placed on promoting recycling, reuse and recover of solid waste. Waste management should be seen as an opportunity and not as a problem.
How do we manage solid waste at Village level?

**Step 1: Identify household and bulk waste generators (hostel, market, marriage halls etc.) and quantify waste generated**

**Step 2: Village Resolution on Biodegradable waste and cattle dung**
- Mandatory waste segregation at source.
- Mandatory cattle dung and other biodegradable waste management at source or village level.

**Step 3: Plan for transportation of waste**
- Village to develop a plan to collect and transport non-biodegradable waste from HHs and bulk generators periodically.
- The village would also need to develop a plan to collect and transport biodegradable waste from those HHs and bulk generators who are unable to process it at their level.

**Step 4 A: Bio degradable Processing Plan**
- Households with cattle must either feed biodegradable waste to the cattle or mix it with the cattle dung for composting
- Household without cattle are encouraged to have onsite compost pits
- Village level composting units should be implemented for remaining households and bulk generators

**Step 4B: Cattle Dung Processing Plan**
- Build dung pits or cover the dung pile from all sides including bottom with polythene sheets to prevent run-off
- Implement biogas units with support from GOBAR-dhan scheme

**Step 4C: Non-biodegradable Processing Plan**
- Create a storage place and store the non-biodegradable and hazardous wastes in separate closed bags/bins
- Stored waste will be collected by the nearest Material Recovery Facility periodically
- Linking with scrap dealers till Material Recovery Facility (MRF) becomes available at district/block level. In this case, secondary segregation at storage place would be required.
Step 5: Determine suitable business model

Identify revenue sources
- Waste collection fee
- Sale of compost and recyclable non-biodegradable waste
- Village funds

Identify operations cost
- Collection cost
- O&M costs of compost pits and storage of non-biodegradable waste
- Other management costs

Decide business model
- Fee structure of BPL families, other HHs, bulk generators etc.
- Will the village SWM system run by itself or outsource to some agency?

Technologies for Solid Waste Management

Technologies for management of Biodegradable solid waste

Some facts about biodegradable wastes

<table>
<thead>
<tr>
<th>DURATION</th>
<th>STATE OF GARBAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 Hrs</td>
<td>Fresh &amp; odorless</td>
</tr>
<tr>
<td>24 Hrs</td>
<td>Start smelling</td>
</tr>
<tr>
<td>48 Hrs</td>
<td>Rots &amp; smells badly</td>
</tr>
<tr>
<td>72 Hrs</td>
<td>Formation of maggots</td>
</tr>
</tbody>
</table>

A) Return to nature

1. Fresh bio waste is a good cattle feed.  
2. Bio degradable waste can be buried in the kitchen garden.
B) Simple composting

1. Composting in an earthen pot:

For households with no cattle, no garden, limited members, limited garbage.

Another method of earthen pot composting could be done by using pots used for cattle feeding.

The process would be as follows:

i. Take an earthen pot normally used for cattle feeding
ii. Make 3-4 small holes in its bottom
iii. Place the pot on a base of bricks and put a small earthen pot between the bricks in the center for collecting liquid manure that will leach out from the pot.
iv. Put a layer of the biodegradable waste and then put a thin layer of paste of cow dung over it. Repeat this process till the pot is full.
v. Cover the pot with cow dung and leave it for 60 days when compost will be ready.

2. Composting with waste decomposer:

National Centre of Organic Farming, Government of India has developed a waste decomposer which takes only 30-40 days to decompose any type of biodegradable waste.

Making Solution

i. Mix 2 Kg of jiggery in 200 liters of water in a plastic drum and stir well
ii. Open the waste decomposer bottle and pour the contents of bottle into the solution (avoid direct contact of contents with hands)
iii. Stir the contents of the container and cover it with a paper/cardboard etc. and stir daily once, solution will be ready in 7 days.

For further making of solution, take 20 litres of this ready solution and put it in a drum of 200 litres and fill with water and add 2 Kg of jaggery. Stir the contents of the container and cover it with a paper/cardboard etc. and stir daily once, another 200 litre solution will be ready in next 7 days.
Composting

i. Spread 1 tonne of waste material

ii. Wet it with decomposer solution

iii. Spread one more layer of waste material above the existing layer

iv. Wet it with decomposer solution over the layer

v. Maintain 60% moisture during entire period of composting with waste decomposer solution

vi. Turn over the compost at 7 days interval, if required again wet the waste with decomposer solution

vii. The compost is ready to use after 30-40 days.

3. Household simple compost pit:

For households with one or two cattle, garden, fairly sizeable garbage.

Length x Breath x Depth = 3ft. x 3ft. x 3ft.

Compaction around the pit with soil + Dung

A layer of brick bat at the bottom (no cementing)
4. **Brick-lined compost pit:**

   ![Brick-lined Household Compost Pit](image)

For households with one or two cattle, garden, fairly sizeable garbage.

5. **Bamboo composter:**

   For households with one or two cattle, garden, fairly sizeable garbage.

6. **Over ground compost tank (NADEP tank):**

   For households with more number of cattle, agro waste etc.
7. Readymade HDPE bed for composting:

![Readymade HDPE bed for composting](image1.jpg)

8. Pipe composting:

For households having very low space and no cattle.

- For the pipe composting method, we need two or three PVC or concrete pipes of 8 inch diameter and length of about 5.5 feet.
- The pipes are placed vertically in a foot-deep trench.
- It should never be covered tightly. Air circulation is necessary for turning the waste into manure.
- Initially, a small amount of cow dung and jaggery is put in with some mud. This results in bacterial decomposition process.
- Later, only kitchen waste or wet waste is put into the pipe.
- The manure can be taken out by pulling the pipe out of the trench and pushing out the contents.
- To keep rats away from the pipe, stones can be spread around the pipe.
- There is no need to use any bacterial solution.

9. Heap method of composting (windrow system):

Windrow composting is the production of compost by piling organic matter or biodegradable waste, such as animal manure and crop residues, in long rows (windrows). This method is suited to producing large volume of compost.

![Heap method of composting (windrow system)](image2.jpg)
C) Vermi composting

Vermicomposting: Salient characteristics

- Fast process- requires only 40 to 50 days as compared to the conventional process which takes 3 to 4 months.
- The process is free from foul odour.
- Rich in plant nutrients like N,P,K,Ca,Mg,S.
- Contains plant growth hormones & antifungal elements
- Complete destruction of weed seeds.
- Cent percent conversion of garbage

Vermicomposting: Species of earthworms

- Preferably local local earthworm should be used.
- Earthworms generally suitable for Indian conditions.
  - Eisinia foetoida
  - Eudrillus euginae
  - Perionyx excavates
- No. of earthworms required – 50 to 100 live worms per sq.ft.
- Earthworms multiply very fast – get doubled in 50 days

1. Household Vermi tank:

2. Community Vermi tank (four pit):
3. Community Vermi compost unit (Shed):

![Vermi compost unit diagram]

4. Vermi wash unit:

It is a byproduct of vermi composting unit.

![Vermi wash unit diagram]

D) Animal waste management

<table>
<thead>
<tr>
<th>WHAT NEEDS TO BE MANAGED?</th>
<th>POSSIBLE SOLUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cattle Shed</td>
<td>Improvisation: minimum flooring with suitable drainage system for urine collection</td>
</tr>
<tr>
<td>2. Dung</td>
<td>Biogas / composting / vermicomposting / cakes</td>
</tr>
<tr>
<td>3. Urine</td>
<td>Use in crops / Biogas plant / Compost / soak pit</td>
</tr>
<tr>
<td>4. Feed Residues</td>
<td>FYM / composting</td>
</tr>
<tr>
<td>5. Carcasses</td>
<td>Scientific flaying / Scientific burying</td>
</tr>
</tbody>
</table>

1. Improvisation of cattle shed:

It is a byproduct of vermi composting unit.
2. Cattle dung management:

3. Cattle dung management: Biogas plant

Household with livestock can very well adopt biogas plant for managing animal waste. A household with 5 to 6 members & 3 to 4 adult cattle can become self-reliant with biogas for cooking. Moreover, they can get high quality organic manure for their farms. Third major advantage of biogas technology is freedom from filth. The animal dung undergoes anaerobic decomposition inside a bio gas plant & the slurry after treatment is odorless and does not attract flies.

The household toilet can also be attached to the biogas plant which adds to the production of biogas.
Technologies for management of non-biodegradable solid waste

Plastic waste management

The most difficult of all non-biodegradable waste is the management of plastic waste.

Principles of plastic waste management
1. Refuse: Single use plastics
2. Reduce: Use only if inevitable
3. Find out plastic free alternatives
4. Don’t litter
5. Collect separately
6. Ensure recycling chain is maintained

Technologies for plastic waste management include the following:

1. Products that can be made at the village level

Some of the products which can be made at village level using shredding, cutting, weaving etc. of plastics are;
- Plastic rope
- Plastic bag
- Plastic mats
- Pillows and mats
- Showpieces
- Use of plastic bottles for construction of walls

2. Use of plastic in road making

- Shredding of plastic and its use in rural road making in limited quantity for mixing in coal-tar.

3. Fuel from plastic waste

Plastic is made from petroleum. Technologies are now available to convert plastic waste into petroleum which can be used as fuel.
4. Use of recyclable plastic waste for making tiles
Tiles can be made from polybags which can be used for pavement of foot paths.
Besides being fire-proof and damage-free, these have been designed for percolation of water and thereby ensure better ground water table recharge.

5. Use of non-recyclable plastic waste in cement factories as fuel
Cement factories in India have agreed to collect non-recyclable plastic waste for use as fuel in their factories within 200 KM from their locations. In case the waste available is more than 200 KM away from the cement factory, Indian railways have agreed to make arrangements for transport beyond 200 KM.

6. Recycling of multilayer waste packs
Multilayer packs are more harmful than plastic. It can be reused along with paddy straw in making baskets and various decorating items at the village level. However, it would cover limited amount of multilayer waste generated and also limited to few places where paddy straw is available and SHGs are trained in doing this.

How to manage other non-recyclable waste:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MANAGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multilayer packing &amp; thermocol</td>
<td>Not to be mixed with general solid waste.</td>
</tr>
<tr>
<td></td>
<td>Should be confined till proper channelization.</td>
</tr>
<tr>
<td>Bio medical waste</td>
<td>Not to be mixed with general solid waste.</td>
</tr>
<tr>
<td></td>
<td>To be handled as per the rules.</td>
</tr>
<tr>
<td></td>
<td>Responsibility lies with health department/PCB</td>
</tr>
<tr>
<td>Sanitary napkin/diaper</td>
<td>Not to be mixed with general solid waste.</td>
</tr>
<tr>
<td></td>
<td>Not considered as bio medical waste.</td>
</tr>
<tr>
<td></td>
<td>No specific rule as of today.</td>
</tr>
<tr>
<td>Other hazardous waste such as batteries/CFL bulb</td>
<td>Not to be mixed with general solid waste.</td>
</tr>
<tr>
<td></td>
<td>To be handled as per the rules.</td>
</tr>
<tr>
<td></td>
<td>Should be confined till proper channelization.</td>
</tr>
</tbody>
</table>
Technologies for waste management other than plastic (recyclable):

- **Recycling of waste paper**
  It is possible to convert waste paper into useful recyclable products. Making pulp from waste paper is an old art. The process has now been refined. Various articles including showpieces may be made using the pulp. The articles are so sturdy that they can be an alternative to wood to some extent. Hence, it is also called Pepwood. Waste paper can also be converted into good quality handmade paper which fetches good price.

- **Recycling of waste cloth**

- **Recycling of metal, glass**
  These can be recycled at centralized industries. Hence these should be collected / stored properly & sold to scrap dealers.

**Guidelines published on waste management**

The following guidelines/Rules of Government of India are published regarding waste management which needs to be followed by concerned stakeholders.

1. GOBARDHAN policy 2018
7. Solid Waste Management Rules, 2016
Some Important Duties of waste generators

- Every waste generator shall segregate and store the waste by them in three separate streams—Bio degradable, non-biodegradable & hazardous waste.
- No waste generator shall throw, burn or bury the solid waste generated by him on street, open public spaces, outside his premises or in the drain or water bodies.
- The waste generator shall minimize generation of plastic waste and segregate plastic waste at source in accordance with the solid waste management rules 2016.
- Waste generator shall not litter plastic waste and ensure segregated storage of waste at source and handover segregated waste to urban local body, or Gram panchayat or agencies appointed by them or registered waste pickers.
GOBAR-DHAN (Galvanizing Organic Bio-Agro Resources Dhan)

1. What is GOBAR-DHAN scheme?

Finance Minister in his budget speech in Feb 2018 announced the launch of Galvanizing Organic Bio-Agro Resources Dhan (GOBAR-DHAN) scheme. It is estimated that about 5 lakh deaths in India due to indoor air pollution caused by unclean cooking fuel (WHO). India is having cattle population over 289 million which has potential of producing 57.8 million cubic meter biogas per day equivalent to 25 million kg/day LPG and 1083.75 million ton/day bio-fertilizer. Similar is the potential of 347 million poultry population of the country to produce 2983 million cubic meter biogas per year which is equivalent to 1277.39 million kg/year.

2. Objectives of GOBAR-DHAN

The objectives of the scheme are as follows:

a. **Energy**: Villages become self-reliant in clean energy by harnessing bio-waste to generate bio-energy and thereby reduce burning and dependence on forests

b. **Empowerment**: Households consume cleaner and cheaper fuel through biogas/bio-CNG for cooking, saving on earnings and time; women of the household who typically engage in collection of firewood/ making dung cakes can be relieved of the drudgery involved

c. **Employment**: Local youth and semi-skilled technicians can benefit from skilling and potential green jobs such as collection of waste, transportation to treatment plants, management of plant, operation and maintenance of plants, sale and distribution of biogas and bio-slurry generated, etc.

d. **Organic Fertilizer**: The digested slurry from biogas plants, a rich source of manure, shall benefit farmers in supplementing chemical fertilizers

e. **Sanitation**: Improved sanitation, by reducing source of pollution, linking toilets to biogas, reducing waste from the villages

f. **Health**: Decrease in incidences of malaria and other sanitation related diseases through reducing waste stagnation in villages; and improving indoor air quality that is otherwise affected by burning of dung cakes and firewood

3. Scope

The vision of MDWS is to have 700 GOBAR-DHAN projects in 2018-19. The program will be funded under SLWM component of SBM-G. Only those GPs which have not availed funds under SBM-G are eligible to receive the financial assistance under GOBAR-DHAN scheme, subject to the limits of guidelines. However, states shall have the flexibility to provide additional funds to any GP based on viability under the scheme through convergence with other central/state schemes
4. Recommended models of implementation and related incentives

<table>
<thead>
<tr>
<th>Model A</th>
<th>Model B</th>
<th>Model C</th>
<th>Model D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gram Panchayat</td>
<td>SHG Federation</td>
<td>Bulk Waste Generator/Entrepreneur</td>
<td>Any Eligible Enterprise</td>
</tr>
<tr>
<td>Supported by Technical Agency</td>
<td>Supported by Technical Agency</td>
<td>Must engage technical agency if no experience</td>
<td>Own/lease land</td>
</tr>
<tr>
<td>Lease land/ GP land</td>
<td>Lease land/ GP land</td>
<td></td>
<td>Waste from project villages or other</td>
</tr>
<tr>
<td>Collection of waste from project villages is</td>
<td>Collection of waste from project villages is</td>
<td></td>
<td>Sells output to fuel companies</td>
</tr>
<tr>
<td>mandatory</td>
<td>mandatory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplies to village at cost/</td>
<td>Supplies to village at cost/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>commercial sale/buyback</td>
<td>commercial sale/buyback</td>
<td></td>
<td></td>
</tr>
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</tr>
<tr>
<td>100% plant cost or as per SBMG SLWM slab as</td>
<td>75% plant cost or as per SBMG SLWM slab as</td>
<td>50% plant cost or as per SBMG SLWM slab,</td>
<td>No financial incentive</td>
</tr>
<tr>
<td>indicated below, whichever is less</td>
<td>indicated below, whichever is less</td>
<td>whichever is less</td>
<td>States may facilitate purchase or</td>
</tr>
<tr>
<td>Plant serving GPs with total</td>
<td>Plant serving GPs with total</td>
<td>Plant serving GPs with total</td>
<td>buyback through PSUs</td>
</tr>
<tr>
<td>funds available:</td>
<td>funds available:</td>
<td>funds available:</td>
<td>GoI has no role</td>
</tr>
<tr>
<td>150 HHs–3.5 lakh</td>
<td>150 HHs–3.5 lakh</td>
<td>150 HHs–2.8 lakh</td>
<td></td>
</tr>
<tr>
<td>300 HHs–6 lakh</td>
<td>300 HHs–6 lakh</td>
<td>300 HHs–4.8 lakh</td>
<td></td>
</tr>
<tr>
<td>500 HHs–7.5 lakh</td>
<td>500 HHs–7.5 lakh</td>
<td>500 HHs–6 lakh</td>
<td></td>
</tr>
<tr>
<td>&gt;500 HHs–10 lakh</td>
<td>&gt;500 HHs–10 lakh</td>
<td>&gt;500 HHs–8 lakh</td>
<td></td>
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</tbody>
</table>

Mode of payment of incentive

<table>
<thead>
<tr>
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<td>SHG Federation</td>
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<td>Any Eligible Enterprise</td>
</tr>
<tr>
<td>25% of incentive shall be in advance, at the</td>
<td>25% of incentive shall be in advance, at the</td>
<td>is back- Incentive ended</td>
<td></td>
</tr>
<tr>
<td>time of DWSC approval</td>
<td>time of DWSC approval</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rest is paid one month after plant is</td>
<td>Rest is paid one month after plant is</td>
<td></td>
<td></td>
</tr>
<tr>
<td>operational</td>
<td>operational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20% of total incentive released can be used</td>
<td>20% of total incentive released can be used</td>
<td>20% of total incentive released can be used</td>
<td>20% of total incentive released can be used</td>
</tr>
<tr>
<td>to pay technical agency as turnkey fee</td>
<td>to pay technical agency as turnkey fee</td>
<td>to pay technical agency as turnkey fee</td>
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</tr>
</tbody>
</table>

Technologies for waste management other than plastic (recyclable):

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<td></td>
</tr>
<tr>
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<td>500 HHs–7.5 lakh</td>
<td>500 HHs–6 lakh</td>
<td></td>
</tr>
<tr>
<td>&gt;500 HHs–10 lakh</td>
<td>&gt;500 HHs–10 lakh</td>
<td>&gt;500 HHs–8 lakh</td>
<td></td>
</tr>
</tbody>
</table>
Details of a project completed under GOBAR-Dhan in Rajgarh, MP

<table>
<thead>
<tr>
<th>Model</th>
<th>C- Bulk Waste Generator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget</td>
<td>7.94 Lakh</td>
</tr>
<tr>
<td>Land required</td>
<td>1500 sqft approximate</td>
</tr>
<tr>
<td>Feeding Material</td>
<td>425 Cow's dung</td>
</tr>
<tr>
<td>Water</td>
<td>Tube well</td>
</tr>
<tr>
<td>Man Power</td>
<td>One Man</td>
</tr>
<tr>
<td>Time Taken for completion</td>
<td>3 Months</td>
</tr>
<tr>
<td>Beneficiaries</td>
<td>Boys hostel, (30 Seater) 7 households</td>
</tr>
<tr>
<td>Technical Agency</td>
<td>UrjaBio System Pvt. Ltd. Construction</td>
</tr>
<tr>
<td>Agency</td>
<td>Goshala - Trained Person Provided by technical agency</td>
</tr>
<tr>
<td>Type of Plant</td>
<td>Floating Dome, 25 cbm</td>
</tr>
<tr>
<td>Slurry Management plan</td>
<td>Self use, local farmer, Nursery</td>
</tr>
<tr>
<td>IEC/Capacity Building</td>
<td>Orientation, Training, Exposure visit</td>
</tr>
</tbody>
</table>

This community biogas plant established in Tapi district of Gujarat involves purchase of Cow-dung from beneficiary HHs by GP and sale of biogas and manure to them on mutually agreed prices. It has 2 plants of 85 CM capacity each is making a profit of around Rs. 9 Lakh per year; it purchases cow dung of Rs 60,000 per month (4000 Kg per day x 30 days x@ Rs 0.50 per Kg) and supplies gas to 120 HHs @ Rs 300 per month (Total Rs 36000 per month) and sells fertilizer worth Rs 1,18,800 to HHs(1320 Kg per day x 30 days x @ Rs 3 per Kg). Thus the total revenue generated is Rs 1,54,800 per month as against the purchase of cow dung of Rs 60,000 per month and staff cost of 20,000 per month (2 part time persons for 2-3 hours per day).

Challenges based on past experience of facilitating community biogas plants.

- Due to past experience of failure of plants, community doesn't get agree to establish biogas plants
- There are diversity in having number of cattle among families, which create difficulty to cater all families equally
- Families who practice putting their cattle dung directly in their farms, don’t get easily agree to give their cattle dung to plant
- Daily operation and maintenance is highly required, otherwise choking in plants can happen resulting in failure of the plant.
What needs to be addressed for a successful community biogas plant

- **Availability and regular feeding of bio-degradable waste** in required quantity on a daily basis; a dedicated person is critical for ensuring regular collection of bio-waste and feeding it in the plant; it is feasible to hire such person in case of community plant as the cost can be shared between all the HHs getting benefitted by the plant.
- **The transportation cost and logistics** could be an issue, if the distance is more from the site.
- **Proper survey of the village** is needed in respect of headcount of animals to assess the availability of cow-dung as also assessment of other bio-degradable waste, willingness of HH for the scheme and availability of community land for construction of community biogas plant.
- **People undertaking responsibility for making available cow-dung** is the first thing. The experience is that if people get paid for the cow-dung, they become interested in the scheme. At the same time, this has also been observed that it can pose a problem in terms of people demanding increased rates for the cow-dung.
- **The quality of cow-dung and other bio-degradable waste** needs to be checked. It cannot be fed directly. There are chances that some non-biodegradable waste such as plastic pouch etc are mixed. Therefore, a kind of segregation activity is a must before feeding the waste in the plant.
- **The most crucial is therefore the people’s participation in the scheme.** There is a need to trigger and inform the target group for this. Gram Panchayat has to undertake the role of overall supervision, O&M from the point of view of the sustainability of the project.
What is Liquid Waste?

Water ‘wasted’ as a result of various human activities at home, in businesses, or in industries is called liquid waste (LW). In other words, “Used & unwanted water generated during household or commercial activities is called Liquid Waste.”

Key Principles of Liquid Waste Management

1. **3R = Reduce Reuse Recharge**
   - **Reduce**: Judicious use of fresh water: Minimal generation of greywater.
   - **Reuse**: For purposes other than drinking:
     - I. Kitchen garden / agriculture
     - II. Toilet flushing
     - III. Vehicle washing
     - IV. Sprinkling in courtyards / roads
   - **Recharge**: Groundwater recharge

2. Separation of Black Water (if any) & Grey Water
3. Reuse of Waste Water to maximum possible extent
4. Treatment of Waste water at nearest possible point from the point of generation / adopt Decentralized systems.
Grey Water Management

As shown in the figure above, waste water from kitchen, bathroom, cloth washing, washing of utensils is called Grey Water.

How much Grey water is produced?

![Diagram showing Fresh Water and Grey Water]

It is estimated that rural India generates about 15,000 to 18,000 million liters of grey water per day.

How do we manage Grey Water?

**STEP 1: Identify sources and quantity of grey water generated in the village**

Categorize waste generation points according to household, common public water points, water stagnating areas, and drainage discharge points and quantify grey water generated.

**STEP 2: Understand local conditions**

Terrain, ground water level, flood occurrences, soil permeability, septic tank overflow into drains, treated water reuse potential, funds and skills available for O&M

**STEP 3: Grey water Management Plan**

- Develop a plan with appropriate mix of household and community soak pits, and grey water management systems such as Waste Stabilization Ponds, Reed beds, DEWATS and others
- Design appropriate conveyance (drains, short pipes) system for each disposal or management system as per plan above
- Design all systems with technical support from district engineers and start implementation
Some essential do’s for grey water management

1. Improvisation / Preparation of Bathing place & or Washing place – It is essential to have a proper structure for bathing place or washing place—the main origin of waste water in a household—in order to ensure proper flow of waste water into the system. If such a structure does not exist or is damaged it is essential to construct one or repair damaged structure.

2. Incorporate following components at household level. This is a simple device which prevents entry of mosquitoes into the waste water system as well as preventing odour in the system.

3. Silt chamber-cum- Grease Trap
   Silt chamber is an arrangement to remove solids from the waste water by settling.
   This is important as it prevents clogging of the system, pipes etc.

Technologies for Household Level Management of Grey Water

1. Kitchen Garden
   This is a simple and easy way of reusing wastewater at the household. If grey water is partially treated to retain solids, oils and grease it can be used for growing vegetables/flowers/fruits for household use.

   As described in previous paragraphs, the household wastewater must pass through a nhani trap or a P trap to remove impurities. The nhani trap should also be covered with a suitable screen to screen out solids from the wastewater. Additional provision of a silt chamber is also recommended to remove organic matter and solids. This will ensure clean water in the kitchen garden and will eliminate odour nuisance and vector breeding.

   The wastewater passed through nhani trap and silt chamber can either be directly used in the kitchen garden or it can be first stored in a suitable storage tank and used as per the need of the plants.
2. Soak Pit
This is a simple and easy way of reusing wastewater at the household. If grey water is partially treated to retain solids, oils and grease it can be used for growing vegetables/flowers/fruit for household use.

As described in previous paragraphs, the household wastewater must pass through a nhani trap or a P trap to remove impurities. The nhani trap should also be covered with a suitable screen to screen out solids from the wastewater. Additional provision of a silt chamber is also recommended to remove organic matter and solids. This will ensure clean water in the kitchen garden and will eliminate odour nuisance and vector breeding.

The wastewater passed through nhani trap and silt chamber can either be directly used in the kitchen garden or it can be first stored in a suitable storage tank and used as per the need of the plants.

Some common mistakes observed in construction of soak pit are following:
- Volume: either too less or too large
- Bricks instead of Boulders
- Sand layer on the top
- No cover / Improper cover
- No chamber around the filter
- Filter not cleaned periodically
- Limitations of soak pit:
  - It cannot accommodate higher volumes of greywater / occasional higher influent
  - Availability of stones not universal
  - It is not suitable in Impermeable (Black Cotton) soils
  - It is not suitable in hard strata
  - It is not suitable in permanent water logged / high water table areas

3. Leach Pit
This is the simple and most cost effective option for the treatment of household grey water. Besides, requiring minimum space operation and maintenance (O&M) of this system is also minimal and easy.

Description
This is a brick-lined pit constructed in the courtyard of a house at a convenient place. The grey water from the house (kitchen wastewater, bathing water, washing water, etc.) should be directed to this pit. It is essential to pass the water through a nhani trap or P trap to avoid entry of mosquitoes and exit of foul odour. A silt chamber, prior to the leach pit, retains solids and ensures proper functioning of the leach pit. The pit is suitably covered with flag stones or Reinforced Concrete Cement (RCC) cover of required dimensions.

Leach pit can also be constructed using prefabricated cement rings. It is important to clean Nhani trap/silt chamber periodically. Desilting of pit is required once in 5-10 years.
Technologies for community level Grey Water management

In situations where the houses are densely located and there is no space for an individual leach pit or kitchen garden, or the soil structure does not favor a leach pit (rocky or impermeable strata), grey water management in neighborhood can be a desirable option. Under this reuse of grey water in common kitchen garden and/or community leach pit for a group of houses may be the desired option.

1. Reuse in community plantations
Like kitchen gardens at individual household, wastewater from a group of houses can also be utilized in community kitchen gardens.

In situations where the geophysical conditions are not congenial or the houses are densely located and there is no space for a kitchen garden or even for a leach pit, the waste water from a group of houses can be channelized and utilized for growing vegetation at a distant place.

Suggested Usage
1. Vegetable garden for commercial purpose
2. Orchards (fruit trees) for commercial purpose
3. Existing park/garden in the village
4. Roadside trees/other vegetation

2. Community Leach Pit for a Group of Houses
Description
This is a brick-lined pit constructed at a convenient place for a group of houses. The number of houses to be connected should be calculated based on the grey water discharged from each house and the space available for the community leach pit. Grey water from the houses (kitchen wastewater, bathing water, washing water, etc.) should be carried to this pit.
Technologies for Management of Grey Water in a centralized manner (for the entire community)

There are GPs where household or decentralized systems are not feasible for the following reasons:

- No space near houses due to densely located housing structure;
- Hard strata in habitations;
- High water table areas; and
- Water logged conditions around houses.

In such situations, it is necessary to opt for centralized systems for grey water management. A centralized grey water management system has the following essential components:

- An improvised bathing cubicle or similar structure at the household with a Nhani trap/P trap
- A silt chamber at the household
- Transport of grey water from individual households to the final treatment unit with intermediate silt chambers
- A final treatment unit

Among these 1 and 2 have been discussed and detailed earlier

**Transport of Grey Water through pipes**

It is advisable to convey grey water from individual houses to the treatment unit through a pipeline.

The advantages of a pipeline over a conventional drain

- More economical than a drain.
- Minimum resistance;
- Ease in implementation – laying of a pipeline is easier than constructing a drain;
- No clogging on account of indiscriminate dumping of garbage in the drains;
- Maintenance easier than a drain.
Final treatment of waste water

1. Grey water stabilization pond/sullage stabilization pond

Description
This is a series of basins or ponds located at a suitable site away from the human habitation where grey water is treated. The treatment is natural and involves:
1. Sedimentation or settling of solids in the wastewater, and
2. Degradation process involving bacteria, algae, sunlight and oxygen which degrades the organics and utilizes the nutrients in grey water and increases its usability.

Essential Components of the System

The system has three basic units called ponds, placed in series and characterized by their function such as:
1. Anaerobic pond – one number
2. Facultative pond – one number
3. Aerobic pond or maturation pond – one or more in number depending upon the impurities in the grey water.

What is black water?

The effluent from septic tank toilets is either left in open or flown through open drains. Both the practices are not desirable as the wastewater are high in organics and pathogens and could pollute ground and surface water sources.

Technologies for Management of Black Water

Black water is wastewater from toilets or water contaminated with fecal matter. Since it contains pathogens which could endanger health, effluent should not be discharged in the open or in the open drains.
Management of Effluent from Septic Tanks

The effluent from septic tank toilets is either left in open or flown through open drains. Both the practices are not desirable as the wastewater are high in organics and pathogens and could pollute ground and surface water sources.

1. Leach Pit
The effluent from a septic tank can be discharged in a leach pit suitably constructed near the septic tank.

Selection of Site
a. The leach pit should be located 10 m away from any ground water source
b. There should be a safe distance of 2 m between the bottom of the leach pit and the ground water
c. A safe distance of 1 m should be maintained between the leach pit and the house wall

2. Community Leach Pit
In case of houses having septic tanks but no space for a leach pit or in case of habitations with hard strata or high water table, the best option is the community leach pit.

For design and other details, please refer to the section on the community leach pit for grey water. The volume of such a leach pit can be calculated on the basis of the quantity of black water discharged from the houses connected.

3. Common Treatment Unit (Waste Stabilization Pond)
In situations such as hard strata, water logged conditions, high water table areas, waste stabilization ponds could be an option for treatment of black water.

Modifications Necessary
If the waste stabilization pond for wastewater, including black water, is to be designed, the HRT of different ponds should be
1. Anaerobic Pond – 5 days
2. Facultative Pond – 10 days
3. Maturation Pond – 10 days

Chlorination
At the end of the system, it is advisable to have a chlorination unit with pot chlorination or a chlorine doser as per the situation. This ensures pathogen-free water from the treatment unit. Such water is safe for agricultural reuse.
Operation and Maintenance
All O&M measures applicable to grey water stabilization ponds should be followed. Periodical testing of water for BOD, COD and fecal coliform content is essential.

What is yellow water?
In individual households, toilet is used for urination but at public places & in institutions like schools urinals are essential. In most cases such urinals either do not exist or are in a very bad condition and urine generally flows in the open or into open drains.

Technologies for Management of Yellow Water (Human Urine)
Yellow water or human urine is also a waste of human origin which needs to be taken care of. In an ODF household, urination is generally practiced in a toilet. However, in public places like markets, bus stands, shopping places, public institutions & offices urinals are neither provided or if these exist are not properly constructed or managed. Provision and management of urinals in public places should be a part of village SLWM plan.

Urine is also a potential source of organic plant nutrients and the urine from such urinals can either be used in agriculture or it can be contained in leach pits of appropriate design.

Some Facts about Human Urine
• Urine very rarely contains any harmful pathogens
• Urine is a potent source of plant nutrients
• Nitrogen : 15 to 19 % (on dry weight basis)
• Phosphorus : 2.5 to 5.0 % (on dry weight basis)
• Potassium : 3.0 to 4.5 % (on dry weight basis)
• Fresh Urine does not emit foul odour. However, on stagnation it emits foul odour
• Bad odour of stagnated urine is due to Ammonia & H2S
• A single person gives out about 500 lit of urine in a year
• Urine collected from schools, other institutions & public places can be utilized in agriculture & it can be a very potential commercial activity.
• Human urine can be managed in several simple ways.
1. **Urinal attached to a simple soak pit**
The final outlet from the urinals can be attached to a simple soak pit. The urine gets soaked in the surrounding soil & there is no foul smell. However, in this type there is no utilization of urine as a plant nutrient.

2. **Urinals with a collection system**
In this type urine from urinals is collected in a plastic barrel placed in an underground brick-lined pit. The same is collected periodically by a simple hand operated pump & is stored in plastic cans. These cans can be taken to farms & the urine is applied to crops as fertilizer.

3. **Urinals with Absorption Pit**
Urine can also be absorbed in some dry biomass & organic matter like dung powder & later utilized as fertilizer in the field. Once absorbed it does not emit any foul smell.
Faecal Sludge Management (FSM)

What is faecal sludge (FS)?

Faecal sludge is the waste accumulated in a single pit or septic tank-mostly a mixture of excreta and water.


Came into force on Dec 6, 2013

“Prohibition of Insanitary Latrines and Employment and Engagement for cleaning of Sewers or Septic Tanks as Manual Scavenger.”

What is Scum?

Scum is a sticky semi-liquid mixture which floats in the tank and continuously goes through aerobic decomposition. As soon as its density increases, it settles down in the form of sludge.

Why manage faecal sludge and septage?

Risks associated with unscientific disposal of FS

- Polluting soil, surface water and ground water
- Contaminating agricultural produce
- Causing the spread of fatal diseases such as diarrhoea, cholera and helminthiasis due to faecal contamination.

What is FSM?

Faecal sludge management (FSM). Involves emptying, transportation, treatment and disposal of sludge from single pits or septic tanks in a safe manner.
Twin pit toilets and FSM

Twin pit toilet is a self-contained FSM unit. Faecal sludge is not required to be taken out. Instead, once a pit becomes full, it is left for a period of one year or more. During this time the excreta turns into manure, which is then taken out for use in agriculture, as it is pathogen-free.

Septic Tanks and FSM

**Why desludging required in septic tanks?**

A septic tank is, generally, an underground tank where sewage from house enters to be decomposed bacterially. Inside the tank solid wastes are broken down by bacterial activity and liquid water comes out of tank to be disposed in leach/soak pit. In a septic tank, incoming waste separates in three layers. The bottom layer is of heavier particles than water and called sludge, top layer is of solid particles lighter than water such as oils and grease which float above middle layer of clarified waste water.
If accumulated sludge at the bottom of a septic tank is not cleaned periodically, it will grab more space inside the tank and the following situation may arise:

1. High chances of pipe blockage due to increased solid sludge in tank and flow from house to septic tank will get affected.
2. If septic tank is connected to leach/soak pit, the pit will block because of increased sludge flow.
3. Tank substance may turn toxic resulting in killing of bacteria which help in decomposition of waste.
4. Foul smell near tank.
5. Sludge is full of harmful pathogens which are threat to human health.

**Desludging of a septic tank**

- If a domestic septic tank is not overloaded, it may be cleaned once in 3-5 years. In this regard, the Indian Standard code for septic tank mentions that a tank requires cleaning when sum of the depth of sludge and scum layer exceeds half the depth of the tank.
- Frequent cleaning of tank is also not desirable as it hampers bacterial activity inside tank.
- Cleaning should be performed by using pipe of not less than 150 mm diameter (6 inch) with a hydrostatic pressure of at least 450 mm to a sump. Pumps can also be used for desludging. Manual handling of sludge should be avoided.
- Not all the sludge from tank should be taken out. A sludge layer of not less than 25mm (1 inch) depth should be left inside the tank for acting as a seeding material for incoming waste.
- Top layer of scum should not be disturbed more than necessary as its presence helps in effective operation of septic tank.

**How to implement FSM at village level?**

1. Survey of sub structure of toilets (Is it single pit or septic tank)
2. Do counselling to HHs to retrofit their toilet pits and ensure FSM
3. Convert single pit into twin pit
4. Dispose effluent of septic tank in leach pit
5. New septic tank should be constructed as per prescribed specification in IS: 2470
6. Motivate HHs to desludge septic tank at least once in 3-5 years
7. Motivate people to avoid manual scavenging for desludging of toilet pits/tanks
8. Identify all FSM operators in the area. Facilitate licensing their operations through GP. GP to link them with the HHs and decide desludging fee to be paid by HHs
9. Motivate people to ensure that desludged septage is not disposed in unsafe manner by the service provider in their village area. It should be disposed at the nearest STP/FSTP
Some Treatment Technologies

1. Unplanted drying bed

- Unplanted sludge drying beds are shallow filters filled with sand and gravel with an under-drain at the bottom to collect Leachate. Sludge is discharged onto the surface for dewatering (Shown in figure).
- The drying process in a drying bed is based on drainage of liquid through the sand and gravel to the bottom of the bed, and evaporation of water from the surface of the sludge to the air.
- After reaching the desired dryness, the sludge is removed from the bed manually or mechanically.
- Further processing for stabilization and pathogen reduction may be required depending on the intended end use option.
- Factors that need to be taken into consideration while designing the unplanted drying bed are: humidity, temperature and rain fall in the area.
- The leachate collected from the drying beds is collected in a leachate storage tank and discharged into the facultative stabilization pond.
- The purpose of drying bed is to achieve dewatering i.e. a physical separation between solids and liquid.
- Drying beds are not designed with stabilization or pathogen removal in mind, although some biodegradation may occur.

2. Planted drying bed

What is Planted drying bed?

Planted drying beds (PDBs) also sometimes referred to as:
Planted dewatering beds, vertical-flow constructed wetlands and sludge drying reed beds, are beds of porous media (e.g. sand and gravel) that are planted with emergent macrophytes.

What is Macrophytes?

Macrophytes are plants found in wetlands, marshes and swamps, and are distinguished by their ability to grow when partially or fully submerged in water.
Mycrophytes play an essential role in the following:

- Stabilizing the beds to prevent media erosion and clogging, and improving the drainage
- Increasing moisture loss (through evapotranspiration, in contrast to only evaporation in unplanted drying beds)
- Providing a surface area for microbial growth within the sludge layer
- Transferring oxygen to the sludge layer (i.e. within the rhizosphere)
- Absorbing heavy metal and nutrients

3. Co-composting

- Co-composting is composting of septage along with other organic waste such as food waste, paper, yard waste (e.g. leaves and branches) cut or removed during landscaping.
- Co-composting is done in batches. Septage and other organic material are placed in piles or rows. Various parameters need to be controlled to ensure an optimal composting process, including temperature, moisture, carbon–nitrogen ratio and oxygen concentration.
- Co-composting takes several months and needs low amount of energy. The process produces compost, a dark, rich soil-like material which can be used as a soil conditioner.

4. Deep Trenching (Possible only in low water table areas)

Deep row entrenchment consists of digging deep trenches, filling them with sludge and covering them with soil.

Trees are then planted on top, which benefit from the organic matter and nutrients that are slowly released from the FS.

In areas where there is adequate land available, deep row entrenchment can present a solution that is simple, low cost, has limited O&M issues and produces no visible or olfactory nuisances.

Benefits are also gained from the increased production of trees.

However, the availability of land is a major constraint with deep row entrenchment, as is the distance/depth to clean groundwater bodies.
What is SLWM Triggering?

It is a process of community self-analysis of their solid and liquid waste management profile leading to collective decision & local action for safe management of solid and liquid waste in the village.

SBM-G used Community Approaches to Sanitation (CAS), which is quite different from traditional Information, Education and Communication (IEC) approaches, as shown in the table below.

<table>
<thead>
<tr>
<th>Information, education and awareness (IEC)</th>
<th>Community Approaches to Sanitation (CAS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>State scheme funds</td>
<td>Ganga Gram Yojna</td>
</tr>
<tr>
<td>A linear theory of change: awareness-demand-supply-behaviour change</td>
<td>A non-linear theory of change: collective local analysis-triggers the need to change-collective local action-behaviour change</td>
</tr>
<tr>
<td>An externally driven process with focus on messages, medium and money</td>
<td>An internally driven process with focus on community triggering leading to collective local action for behaviour change</td>
</tr>
<tr>
<td>Focus on toilet construction as the key message as an outside agenda</td>
<td>Focus on total and collective behaviour change as a social imperative</td>
</tr>
<tr>
<td>Focus on money and material</td>
<td>Focus on self-help and innovative use of local resources</td>
</tr>
<tr>
<td>Lack of focus on the larger operating environment and various factors and actors at work therein</td>
<td>Enhanced focus on multi-stakeholder engagement for creating an enabling environment for sustained behaviour change</td>
</tr>
<tr>
<td>Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)</td>
<td>Funds under Gram Panchayat Development Plan (GPDP)</td>
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Triggering Process: An overview

**Triggering Part I: Community realization and collective decision to go for SLWM:**

Step 1: Greetings, Introduction and explaining purpose
Step 2: Climate setting
Step 3: Applying trigger tools
Step 4: Community resolve to manage solid and liquid waste properly

**Triggering Part II: Community Action Planning for SLWM**

Step 5: Sharing of technology options
Step 6: Formation of village SLWM Committee
Step 7: Oath taking (Shapath Grahani)
Step 8: Community action planning and consensus for initiating cleanup campaign the next day morning
Triggering Part I: Community realization and collective decision to go for SLWM

STEP 1: Greetings, Introduction and explaining purpose

- The facilitator starts with greetings and self-introduction followed by introduction by only prominent people like Natural Leaders, Gram Pradhan, GP Members, Teachers, AWW, ASHA, SHGs leaders and other influential people of the village.
- The facilitator then explains the purpose of visit to learn what people are thinking about achieving total clean environment in the village beyond the ODF status already achieved.

STEP 2: Climate setting

- Ask people about the various activities done for ODF achievement. Encourage them to express their feelings of pride for achieving ODF status and establishing new social norm in the society, resulting in benefits in terms of health, dignity, social and economic well-being. Recognize the achievement with big hand clapping by everyone present.
- Then ask: What could be done to sustain ODF status and fill up the gaps, if any?
- Ask: whether they have achieved total sanitation? and can be designated as ‘Swachh’/’Nirmal’? If not, what could be done to further improve their surroundings?
- Gradually, draw the attention of villagers towards wastes in and around the village.
- Ask them to compare the current situation with what it was 10 years ago.
- How and why it has been happening?
- By the end of the step, a consensus is built that it is high time to analyse our own situation, particularly in respect of solid wastes, its harmful effects and way out.

STEP 3: Applying trigger tools

- Apply trigger tools according to the situation and your own best judgement. Some trigger tools that have been found to be effective across different contexts include the following (the list is not exhaustive):
  - Identification of wastes
  - Waste/Resource Mapping
  - Calculation of plastic carry bag waste
  - Waste Segregation
  - Calculation of Bio-degradable Solid Waste
  - Calculation of Medical Expenses
  - Say no to plastic carry bags, use and throw items of thermocol and plastics
  - Pre and post pictures tool (pictures of current practices of dealing with garbage and dreaming of an improved situation)
  - Visit to stagnant pools of waste water
STEP 4: Community resolve to manage solid and liquid waste properly

- Once a community resolve comes to manage solid waste properly, stop applying trigger tools and move to the part 2 of the triggering process.

Triggering Part II: Community Action Planning for SLWM

STEP 5: Sharing of technology options

- Share the following solid waste management technology options:
  - Return to nature
  - Compost pits
  - Composting through waste decomposer
  - Pipe composting/pot composting
  - Vermin-compost pits
  - Biogas plant for bio-degradable waste
  - Recycling for non-biodegradable waste
  - Depending on time availability, some simple options for managing waste water should also be explained. These would include:
    - Kitchen garden
    - Covered drains with leach pit
    - Soak pit

STEP 6: Formation of village SLWM Committee

- The Nazrdari/Nigrani Committee formed during ODF process, could come forward to undertake this responsibility. Otherwise, it would need to be strengthened by including new volunteers.
- The committee agrees to motivate villagers through door-to-door visits for at least three things:
  1. Segregation of biodegradable and non-biodegradable wastes at HH level;
  2. Compost pits in each HH within a time frame.
  3. Encourage use of cloth bags instead of plastic bags, leaf plates instead of thermocol plates and earthen cups instead of plastic cups.

STEP 7: Oath taking (Shapath Grahan)

- Encourage community members to take an oath collectively about their commitment towards SLWM at village level.
- The oath for ensuring the entire village totally clean includes commitment of starting:
  1. Segregation of biodegradable and non-biodegradable wastes at their homes
  2. Composting of bio-degradable wastes
  3. Refuse/reduce plastic and thermocol use etc.
  4. Stop burning of plastic or any wastes
  5. Not throwing out any plastics or wastes in roads or outside
STEP 8: Community action planning and consensus for initiating clean-up campaign the next day morning

- A plan for implementation and monitoring is then agreed upon so that it is properly carried out in the entire para in the similar manner as done during ODF interventions.
- Facilitate community consensus to initiate clean-up campaign in the village next day morning
- Facilitate the date for demonstration of composting such as use of waste decomposer, pipe composting etc.
- In many villages, vermin compost pits are found defunct. This is mostly because of not building proper understanding of the people before its adoption. They are not very clear about process and benefits of vermin compost. So the construction details, process of filling in layers and other precautions, advantages as compared to simple compost etc. need to be explained.

Some Trigger Tools for SLWM

1. Identification of wastes

- Ask: What wastes (either solid or liquid) are seen in and around their houses and surroundings of village?
- One villager could be invited to write the names of these items on a chart paper.
- The purpose is to enable community members to recognize and identify wastes either solid or liquid which are spoiling their own environment.

2. Waste/Resource mapping exercise

- Process similar to ‘OD area mapping’ in CLTS triggering.
- Ask people to draw village boundaries, roads, various institutions/community assets and individual houses. Appreciate them for drawing such a beautiful map.
- Then open a bag with at least 50-60 items of wastes and ask villagers to put waste items in the map as they are seen in the village.
- Thereafter, ask people to depict the places where stagnant pools of waste water are seen in the village by using grey color.
- Once again ask them how the map is seen now? Even after achieving ODF, are their surroundings completely clean? How many of them would like to give clapping? Do you want to live in such environment? Is it healthy and good for us?
- How many of us want to continue our life in such a situation? Who all want to get out of such environment full of wastes? They are asked to raise their hands.
- Then ask the villagers: Would they like to clean the village map? Would it be better if they do it collectively? In the similar manner, if we all decide to clean our own village, will it be possible?
3. Calculation of plastic/carry bags wastes

- This exercise is done before cleaning up of village map as mentioned in the solid waste/resource mapping exercise. The facilitator picks up items like plastic carry bags, thermocol items; multi-layer packaging one after another and questions are asked about the time these items would take in getting decomposed. It is also asked whether these items are recyclable or could be sold or not.
- People would come up with their answers, which could be noted and supplementary answers could be given, if required.
- Thereafter, facilitate a calculation of number of carry bags that are brought by households with different items that they purchase from the market. It is generally revealed that about 5-6 carry-bags per family per day are brought in with different items to home. The number is then multiplied with the number of families in the para/village; usually it comes around few thousands in a day. Then calculation is done by them collectively for a month and finally for a year.
- Then they are asked as to what they do with these plastic carry bags. The usual reply comes that either they throw these away or burn them. Then they are asked; what happens when it is thrown in and around the village every year? Then they are asked how many years’ villagers are throwing so many plastic bags and what is happening with them; are they getting degraded? How much time would it take to decompose these plastics?
- At this moment, harmful effects of burning plastics are also demystified particularly about emission of dioxin gas and its effect on human health. Immediately they could relate the effects of cancer deaths/diseases in their village. Such collective analysis triggers them to take decision to stop plastic burning with immediate effect.
- Then they are asked: Whether this practice is affecting only them? Can it affect their next generations to come, as life span of carry bags are 200-400 years? Similarly questions are asked about thermocol items and multilayer packagings which are not recyclable and very much harmful for the environment. Such demystification enables them to realize the dimension and depth of causes of harmful effects not only on environment but also on their own life.
- Then they are asked what should be done to save our life from such harmful effects. Collective analysis enables them to decide collectively to stop use of use and throw items made of thermocol not only in shops but also in marriage party and other parties also.
- Uses of multilayer packaging are also explained to them such as preparing decorated baskets/souvenirs by using them along with waste of paddy plant, which would help them to earn money.

4. Waste Segregation

- Ask people to segregate the solid waste items initially into three parts:  
  - Bio-degradable 
  - Non-biodegradable 
  - Hazardous 
- Are all these items wastes only? Or they can easily earn money in case items are segregated at source?
- Then ask them to divide non-biodegradable items into two parts: recyclable [can be sold] and non-recyclable [can’t be sold].
- In the end, ask: Who would like to start segregating waste/resource in their homes and raise income? When?
5. Calculation of Bio-degradable Solid Waste

- This exercise helps in understanding the magnitude of wastes that are produced in their own village and how useful it would be in case it is managed properly.
- Ask: What is the average quantity of consumption of green vegetables in any family? Out of such quantity how much would be it’s wastes such as peel? It may be one or more than one kilogram produced daily. Ask to calculate quantify from daily to monthly and yearly then in the entire village by multiplying with number of households. In addition, other organic agro-wastes are added to make it more realistic quantity in village situation.
- Then ask: What they do with these vegetable wastes? Mostly the answers are: throwing in around kitchen or household.
- Then ask: What happens to these wastes? The answers include: It gets rotten and become source of production of flies and mosquitoes. This enables them to realize that in one hand a good resource is being lost and on the other-hand creating own sources of harmful flies and mosquitoes breeding ground in and around their household within the village.
- They are asked about utility of vegetable wastes? Many of them know or heard about composts but mostly are found not very clear about the exact process of certain composting methods such as use of waste decomposer, composing in earthen pots, pipe composting, simple compost or vermin compost etc. Such situation creates interests among them to know more about exact process of making compost and vermin compost as also biogas plants for managing cow-dung.

6. Calculation of medical expenses

- In order to help people to realize the magnitude of harmful effects (such as diseases) due to indiscriminately throwing away of vegetable/organic wastes, which could otherwise generate income.
- Calculation of medical expenses by households is done in the similar fashion as it is done in CLTS triggering. Average expenditure is calculated by people for a HH and for the whole village in a month and per year, which generally comes into lacs of rupees.
- Then ask: Who we are making rich and poor? What they can do to save themselves from such expenses? Would they like to go for composting of such organic wastes to further reduce expenses against common diseases, which they have been able to do to some extent by achieving ODF? Would it not help them earn money through manure or by selling non-biodegradable waste?

7. Say no to plastic carry bags and use and throw items of thermocol and plastics

- This tool is applied to trigger community to reduce the burden of plastic carry bags, use and throw items of thermocol and plastics such as tea cups, plates, glasses and bowls by following the ‘refuse and reduce’ options of 4R principle of SRM.
- Once the community is triggered and ready to take action for proper management of solid waste in their village ask them, would they like to continue with the same practice of waste generation or say no to plastic carry bags, plastic tea cups and thermocol plates etc.
- Now refer the number of plastic carry bags generated in their village in a day, in a month and in a year which they calculated while using plastic carry bags calculation tool. Share the time period plastic carry bags and thermocol takes to decompose.
- Ask them generally what happens to use and throw items of plastic and thermocol. Majority people would say that they burn it. Now share that burning of plastic emits dioxin gas which is carcinogenic. Now ask them, is there any cancer patient in their village or any death happened in past years due to cancer. Now some people could raise their
hands in affirmation. Ask them, would they like to continue the use of plastic and thermocol. At this time display a clip bag of cloth and explain how convenient it is to carry and how a small habit of use of cloth bags can reduce the burden of plastic carry bags to a great extent.

• Similarly, show the community members earthen tea cup and leaf plate and ask them: Would they like to stop the use of plastic cups and thermocol plates as their substitutes are available in the market? If facilitated well, the newly formed SLWM committee or SHG women gets ready to make and promote the use of simple cloth bags and also motivate people to stop using plastic/thermocol use and throw items and use metallic plates and glasses or earthen cups and leaf plates in functions.

• List out the names of natural leaders who will make and begin the use of cloth bag from next day. Facilitate community for making some commitment such as ‘say no to plastic carry bags and use cloth bags’, ‘say no to plastic cups and use earthen tea cups’ and ‘say no to thermocol plates during public functions and use leaf plates’.

• At the end facilitator can encourage village SLWM committee and SHG to carry and display cloth bags, earthen tea cups and leaf plates while making door to door visits. They can be requested with folded hands to use these environment friendly items to protect themselves from diseases. Facilitator would encourage village SLWM committee, SHG, GP members to visit households well in advance where marriage or any other public function is going to take place and promote the use of leaf plates, earthen tea cups etc.

8. Pre and post pictures tool (pictures of current practices of dealing with garbage and dreaming of an improved situation)

• This tool has been adapted from a similar exercise developed by Water and Sanitation Program-South Asia, The World Bank. Besides triggering community members for SLWM, this tool can also be used to trigger workshop participants comprising of other stakeholders such as PRI members, GP/block/district officials etc.

• It provides an opportunity to people to envision about importance of SLWM in their lives and need of the moment of ensuring a clean and garbage free healthy environment at all level.

• Such exercise is done using pictorial presentations of pre-post/before-after scenarios covering different situations for envisioning/dreaming a clean, healthy and garbage free village.

• The facilitator starts with the question: How has ODF been achieved? Usually the answer provides confirmation of achievement of ODF status through collective efforts of villagers. Then they are again asked even after achievement of ODF what they feel? Have they become clean and safe? Gradually, their attention is drawn towards analyzing how safe they actually are keeping in view the hazards of existing situation with plastic, thermocol and other garbage in and around their own village?

• For this, pre and post pictures on different aspects of SLWM are used as given below. First ask a question about a particular aspect and give some time to people to respond. Then show the related picture of existing situation. Then ask about the possible improved situation and show the picture of dream situation. Then ask what would they like to choose? Existing filthy situation or an improved situation by showing these pictures side by side?

• What we do with plastic, polythene, thermocol and other garbage at present?
• What exactly we want - Plastic, polythene, thermocol and other garbage polluted surrounding or garbage free clean, pollution free & healthy village?

• What exactly we want - Drains with plastic, polythene and other garbage or neat & clean drains?

• In case of ponds what exactly we want- ponds full of plastic & polythene or clean as it was before?

• How our toilets with septic tanks are seen: what we exactly want- Overflow water of septic tanks passing through drains/open or overflow waters are confined in leach pits?
• How do we use our drinking water from public tap-water flowing without any tap or fitted with proper tap, using as per need?

• What exactly we want- public stand point fitted with taps and use as per need or water flowing continuously in absence of tap?

• Where exactly we are going in respect of drinking water use?

• What exactly we do with waste water: flowing through roads and chocked drains?
• What exactly we do with cattle dung: making cakes for cocking and carelessly throwing in heaps in road sides?

• What exactly we want: flowing through roads and drains or using for kitchen gardening and plantations?

• What exactly we want? Making cakes for cocking and carelessly throwing in heaps in road sides or properly using for biogas and manure?

• How our villages are seen right now: what exactly we want? Village full of plastic, polythene, thermocol, other garbage and waste water flowing on the roads or neat & clean pollution free surroundings?
• Now they are asked what they think, their villages are clean and safe at present.
• Immediately next question is asked: what do they think: what are the problems? Plastic, polythene, glass, thermocol, cattle dung and waste water or our own behavior towards waste?
• What exactly do we want: are we ready to lead our own life in this manner?
• Can we change such situations for betterment of our own life?
• What do we think that alone individually it can be done?
• Can we form team and work in teams to get rid of such unhealthy and unsafe situations?
• How many of you want to join hands together to change the present situation?

9. Visit to stagnant pools of waste water

• This exercise is done to draw villager’s attention towards the current situation of waste water in the village; involve them in the analysis of current situation of liquid waste and its impact on their life. Hence, a collective realization and collective consensus can be created for the proper management of waste water. If time permits, this exercise can be conducted towards the end of SRM triggering process otherwise, it can be done after ‘safai abhiyan’ in the next morning or on any other date of follow-up visit.
• Draw people’s attention towards the areas in the map they marked in grey color which indicates the stagnated pools of waste water. They can be asked how many such sites/places are there in the village where large quantity of waste water is stagnated. Now they can be requested to visit those identified areas where they can be involved in self-analysis of the current situation of liquid waste. Then arrive on an agreement on route and time to be taken for the exercise collectively. After reaching the place involve people in discussion by asking questions. Some suggestive questions are given as below:

1. Who all are living here, please raise hands?
2. From how many households this waste water is coming?
3. Does waste water also include the septic tank outflow
4. If the place is stinking, ask people can this smell get mixed with air
5. Then what are you inhaling?
6. What is that hovering on the water? (Mosquitoes)
7. Can these mosquitoes go to your houses?
8. Could they bite you then? (yes)
9. What can happen then? Can we suffer from malaria, dengue etc?
10. Then how much money would it take for treatment?
11. What else is there on the water? (flies)
12. Can they go to your houses?
13. Can they sit on your food plate?
14. What would they leave on the food? (filth)
15. Then what will you eat along with food?
16. Can you get sick then?
17. What are the diseases that can occur due to eating filth?
18. Whose money will go to doctor then?
19. Whose loss? Who created this situation?
20. Then who need to change the situation?

• Try to build a community collective consensus and facilitate community to take collective action to manage liquid waste properly. Facilitate a date and time for follow up visit in which discussion on different technological options for liquid waste management can be facilitated. If the site visited is a pond, facilitate a date for collectively cleaning it.
Menstrual Hygiene Management (MHM)

Introduction

One of the simplest definitions of menstruation available online is, “...the periodic discharge of blood and mucosal tissue from the uterus, occurring approximately monthly from puberty to menopause in non-pregnant women and females of other primate species”.

Facts about menstruation:

- It can begin any time between 9-19 years.
- Healthy menstrual cycle is indicator of female health and vitality.
- 85 % as per a survey conducted, have little, poor or wrong information about it.
- The first menstrual cycle is called ‘menarche’;
- Periods in the first few years of menstruation may not be very regular
- Some women menstruate every 28 days, while others have longer cycles (up to 36 days) or shorter cycles (up to 21 days).
- Periods usually last from 3-7 day, with five days being the average length of menstrual flow.
- Menopause could happen between 40 – 50 years of age

A study revealed

- Only 30.2% girls knew about menstruation before menarche
- 73.6 % felt that menstrual blood was dirty blood and not clean blood
- 98.4 % girls interviewed faced restrictions while menstruating
- No availability of disposal at school in 88.3 % cases : at work 79.4 %
- Almost all preferred cloth to commercial pads
- Used materials were discarded in rivers or streams or in a pit latrine or shallow pit

Let us understand how menstruation occurs

In the first half of the cycle, levels of estrogen (the “female hormone”) start to rise. Estrogen plays an important role in keeping you healthy, especially by helping you to build strong bones and to help keep them strong as you get older. Estrogen also makes the lining of the uterus (womb) grow and thicken. This lining of the womb is a place that will nourish the embryo if a pregnancy occurs. At the same time the lining of the womb is growing, an egg, or ovum, in one of the ovaries starts to mature. At about day 14 of an average 28-day cycle, the egg leaves the ovary. This is called ovulation.

After the egg has left the ovary, it travels through the Fallopian tube to the uterus. Hormone levels rise and help prepare the uterine lining for pregnancy. A woman is most likely to get pregnant during the 3 days before or on the day of ovulation. Keep in mind, women with cycles that are shorter or longer than average may ovulate before or after day 14.

A woman becomes pregnant if the egg is fertilized by a man’s sperm cell and attaches to the uterine wall. If the egg is not fertilized, it will break apart. Then, hormone levels drop, and the thickened lining of the uterus is shed during the menstrual period.
Menstrual cycle

Stage 1: An egg is formed in the ovary and the uterine lining is beginning to form.

Stage 2: The egg moves from the ovary towards the uterus through the fallopian tubes and the uterine lining begins to thicken.

Stage 3: The egg reaches the uterus and does not find a sperm, therefore the unfertilized egg and the uterine lining shed as menstrual blood.

Dispelling myths about menstruation

Menstruation is:

• An indication that a girl is approaching maturity.
• The shedding of tissue and blood from the lining of the womb through a woman’s vagina.
• Also called menses; ‘menstrual period’; ‘monthly bleeding’ and ‘period’; menstruation is a normal and natural part of biological maturity.
• The blood and tissue that comes from the uterus when fertilization does not occur.
• The monthly self-cleaning action of a healthy uterus.
• An important developmental milestone for girls, the same way wet dreams are for boys.

Key messages

• Menstruation is part of growing up.
• Menstruation is normal for every woman, including the differently abled.
• Menstruation is not a women’s issue but a universal issue—men need to know about it too!
• There are many myths and misconceptions around menstruation.
## Sanitary Protection Options

<table>
<thead>
<tr>
<th>SANITARY PROTECTION OPTION</th>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural materials (e.g., mud, cow dung, leaves)</td>
<td>Free</td>
<td>High risk of contamination</td>
</tr>
<tr>
<td></td>
<td>Locally available</td>
<td>Difficult and uncomfortable to use</td>
</tr>
<tr>
<td>Strips of clothes</td>
<td>Easily available in the local market Re-usable</td>
<td>If old clothes are not cleaned well they can become unhygienic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Users need somewhere private, with a water supply and soap, to wash and dry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the cloths</td>
</tr>
<tr>
<td>Toilet paper or tissues</td>
<td>Easily available in the local market</td>
<td>Loses strength when wet and can fall apart.</td>
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<td></td>
<td></td>
<td>Difficult to hold in place</td>
</tr>
<tr>
<td></td>
<td></td>
<td>May be too expensive for the poorest users</td>
</tr>
<tr>
<td>Re-usable pads</td>
<td>Available locally or on the internet</td>
<td>Users need somewhere private, with water supply and soap to wash and dry the</td>
</tr>
<tr>
<td></td>
<td>Income generation opportunity, if locally made</td>
<td>pads</td>
</tr>
<tr>
<td></td>
<td>Cost effective as they are re-usable</td>
<td>If commercially produced, cost is prohibitive to many potential users</td>
</tr>
<tr>
<td></td>
<td>More environmentally-friendly than disposable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>pads</td>
<td></td>
</tr>
<tr>
<td>Tampons</td>
<td>Convenient and comfortable to use</td>
<td>Not available in many contexts</td>
</tr>
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<td></td>
<td></td>
<td>Cost is prohibitive to many potential users</td>
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<td></td>
<td></td>
<td>Generates a lot of waste to dispose, not environmentally-friendly</td>
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<td></td>
<td></td>
<td>May not be culturally appropriate, particularly for adolescent girls, as</td>
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<td></td>
<td></td>
<td>need to be inserted into the vagina</td>
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<td></td>
<td></td>
<td>Hygiene and availability of water and soap for hand-washing are particularly</td>
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<td>important, as need to be inserted into the vagina</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Menstrual cups</td>
<td>Re-usable</td>
<td>May not be culturally appropriate for use, particularly for adolescent girls,</td>
</tr>
<tr>
<td></td>
<td>Only need emptying, washing and drying</td>
<td>as it needs to be inserted into the vagina</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hygiene and availability of water and soap are particularly important, for</td>
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<td></td>
<td></td>
<td>washing hands and menstrual cup, as it needs to be inserted into the vagina</td>
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<td></td>
<td></td>
<td>Expensive first investment outlay</td>
</tr>
<tr>
<td>Panties/Underwear</td>
<td>Useful for keeping a sanitary product in place</td>
<td>Cost may be prohibitive to potential users</td>
</tr>
<tr>
<td></td>
<td>Good for keeping the vaginal area hygienic</td>
<td>Cheap elastic can wear out relatively quickly</td>
</tr>
</tbody>
</table>
Images of Re-usable menstrual material

Images of Single use menstrual material
Hygienic Pad Management

1. Clean a piece of cloth with warm water and detergent if the cloth is old and has been lying unused for a long time. Use an antiseptic solution to clean/sanitize.
2. Dry the cloth in direct sunlight to ensure it is free of any infection-causing germs or organisms.
3. Important: make sure that any embroidery, hooks, buttons; metal or any extraneous materials are removed as any material remaining on the cloth can be very dangerous.
4. If necessary, iron the cloth to make sure that it’s moisture-free. (but it is not a substitute to direct sunlight)
5. Wrap the pads in paper and store in a clean and dry place, ideally inside a clean box or container. Make sure the pads are not vulnerable to mice, lizards, termites and other insects.

Use and care

How to use and maintain home-made sanitary pads for re-use

- Pads need to be kept in a bag or other accessible place two days before expected menses.
- Depending on need. Change the pad a minimum of 3-4 times a day.
- Always carry some paper or a bag to store used pads.
- Used pads should be washed in cold water with soap to remove blood and then treated either with antiseptic (if available) or boiled water to remove germs.
- Place on a clothes line in direct sunlight, and store in a clean, dry place until the pad is completely dry. To illustrate the point, hang the pad on the clothes line in the tent.
- If the pad's cloth is tearing, hardening or cannot be cleaned with ease, throw it away

Safe Disposal Options

The cloth cuttings inside the pad can be thrown away after each use and replaced, if needed. But any waste disposal MUST be done responsibly!

1. Dig a small hole in the ground and bury the pads.
2. If ground is unavailable, wrap the pad in paper and discard in a frequently emptied bin (if doing the at home an outside bin is preferable).
3. If the pad's cloth is tearing, hardening or cannot be cleaned with ease, throw it away.
Some Alarming Facts about Disposal of single use sanitary pads available in the market

Of the 336 million menstruating women in India, 36% which is 121 million use pads like whisper and Stayfree. If each woman uses 8 pads per cycle (which is a conservative estimate), 1 billion pads would be disposed off every month in India alone. That is 12 billion pads a year.

Now, government programs are taking these pads to women in the villages, which would further add to these numbers ….

The focus should be on looking for compostable options, pads made from wood pulp/ banana pulp etc. with absorbent seeds like lavender seeds etc., so that the user is comfortable and the disposal is environmentally safe.

These pads if buried would take not less than 500 to 800 years to decompose.

Incinerating single use commercial pads

Burning these pads at low temperatures below 300 degrees Celsius would cause emission of toxic gases including dioxins and furans known to be carcinogenic.

Most of the incinerators available in the country do not adhere to the prescribed norms.

Disposal Options

Deep Burial

Used cloth and/or sanitary napkins could be buried in a simple pit.

- Dig a pit 0.5m wide x 0.5m in breadth x 1 m deep.
- A pit this size can last for two years. Once filled, another pit can be dug and used.
- Such pits should be dug a minimum of seven meters from water sources, including hand pumps, tube wells, open wells, ponds, reservoirs and rivers.
Composting: This is an improvement over the deep burial method

Used cloth and/or sanitary napkins could be buried in a simple pit.

- In a pit 0.5m wide x 0.5m in breadth x 1 m deep, deposit the waste cloth and sanitary napkins along with leaves, other wet biomass and dung slurry.
- The additional material needs to be added every time cloths or napkins are disposed.
- Cover the material with a layer of soil.

Incineration

Burning of used cloth and napkins is not recommended as the process emits toxic compounds, so it should only be practiced when there are no other feasible options. Depending on available resources there are two options for burning waste, as shown in the illustrations on the right.

Burning/incineration

An example of an incinerator installed in a school. However, burning is not recommended and should be used only when there are no other viable options.

At Schools and Colleges

It is not possible to accurately estimate the volumes of menstrual waste in schools due to several factors, including:

- Varying numbers of students.
- Absenteeism among girls who are menstruating.
- Very few students change their napkins during school hours due to the absence of proper facilities for changing and washing.

Privacy is a key factor in determining the location of menstrual waste disposal and collection facilities on school premises. Therefore, the location of these facilities should be decided after input from female students and teachers.
Disposal Chute and Composting Pit for School Toilets

This design uses a steep 60' chute made from a six inch PVC pipe, which leads from a hole in the cubicle wall to a simple unlined pit in the ground outside, separated from the septic tank and covered with a stone slab. Used menstrual cloths are dropped down the chute; adding a mug of cow dung slurry water once a week aids decomposition of all the organic waste and controls smell. (Almitra Patel, Bangalore).

Some Frequently Asked Questions

Q: How much menstrual flow is there normally?
A: Menstrual flow can vary from person to person. Usually, an entire period consists of a few to several spoonful of blood.

Q: How long should a girl's period last?
A: The duration of a menstrual period can vary from girl to girl but is typically 3-7 days long. One girl might have three-day periods while another might have six-day periods. In some cases, the length of the period can vary from month to month. For example, in the first month, a girl's period might last four days, and then the next month it could be six days.

Q: What kinds of foods should be avoided during periods?
A: Eat everyday foods such as vegetables, roti, rice, pulses and lots of fibre, and drink plenty of water to avoid constipation, as it can lead to increased pain from menstrual cramps. Cutting down on salty foods will prevent water retention in the body.

Q: How does the body feel during menstruation?
A: Sometimes a girl may experience physical or emotional changes around the time of her period, while others may not feel any change in moods or body. Physical changes include: Cramps, pain, bloating, weight gain, food cravings, painful breasts, headache, dizziness or irritability. Emotional changes include: short tempura, aggression, anger, anxiety or panic, confusion, lack or low concentration, nervousness, tension, fatigue or depression.

Q: Is it risky or dangerous to engage in sports and games during menstruation?
A: No, but if you feel tired or weak and feel the need to rest then rest is advised.

Q: Are girls unclean and impure during periods?
A: There is no impurity in the blood associated with menstruation. Cleanliness and hygiene are important to the menstrual flow, to keep away any odor or infection.

Q: Should girls use only sanitary napkins only?
A: No. Clean and dry cotton cloth can be made into a pad for absorbing menstrual blood.

Q: What can be done to relieve menstrual cramps?
A: Place a hot water bottle on the abdomen or on the back, depending on the location of the cramps. Take a warm bath. Drink a hot beverage, such as tea. Take a walk. Rub or massage the abdomen. Get on your elbows and knees so that the uterus is hanging down, which helps it to relax. Lie on your back with knees up and move them in small circles.
Introduction

SDG 6, which aims to ensure availability and sustainable management of water, sanitation and hygiene for all, is an indispensable and interdependent element to achieving the three main aims of ending extreme poverty, fighting inequality and injustice, and fixing climate change.

In keeping with SDG 6, the principle of Leave No One Behind (LNOB), WSSCC and FANSA worked tirelessly in the run up to SACOSAN VI to mobilize and listen to thousands of voices, hitherto unasked and unheard, about their sanitation and hygiene needs.

Across all eight (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka) SACOSAN countries, hundreds of adolescent girls, and disabled people, transgender people and sanitation workers and waste pickers spoke of the fear, discomfort, stigma, discrimination, abuse and total neglect they experience in sanitation and hygiene related tasks, every day of their lives.

This chapter has excerpts from the report compiling outcome of 55 consultations summarized by the WSSCC, FANSA and partners across South Asia as a run up to SACOSAN VI.

LNOB calls for the otherwise voiceless, underserved groups to articulate for their need for safe and satisfactory sanitation and hygiene. It urges to address the Sanitation and Hygiene Needs of Women, Adolescent Girls, the Elderly, Persons with Disabilities and the Sanitation Workforce Workers in the eight countries. This chapter also has quotes from some of the participants in boxes, to allow the reader get a feel of the thoughts and emotions of these groups.

The Elderly and disabled

The United Nations Division for Social Policy and Development Ageing reports that the number of older persons worldwide is set to increase by 56%— from 901 million to more than 1.4 billion by 2030.

WASH facilities for elderly people and people with disabilities (PwDs) across the eight countries are to a large extent inappropriate, inaccessible and inadequate. In both urban and rural areas, people with disabilities use the same toilets as other users. None of these facilities are designed with illness, disability or old age in mind.

Leave No One Behind report notes that most elderly men and women in rural areas resort to open defecation, despite the fact that walking to the fields is a daily struggle with a real risk of falling and hurting themselves.
Elderly men and women with various age related illnesses and constraints, as well as, people with chronic or accident-related disabilities, report real discomfort using toilets, tap stands, and buildings without ramps. Almost all public places, especially railway and bus stations across the eight countries, do not have toilets that are accessible to physically-disabled people. The doors to toilet entrances are usually too small for persons using wheelchairs.

The toilets are wet and slippery, enhancing the risk of a fall and injury. The lack of signs in Braille or tactile paths makes it difficult for the blind to locate toilets; for those with impaired hearing and speech, the fear of being ridiculed acts as a barrier to accessing public toilets. The physically disabled also avoid using public toilets because they are embarrassed about leaving a dirty facility behind after use.

During the Sanitation Action Summit, held at Mumbai in 2016, demands and sanitation solutions for the needs of older persons are listed in the summary report of the event, such as:

- Separate toilets for senior citizens in urban slums
- Toilet design that considers the specific needs of the elderly
- Including older people in slum management committees and other decision making forums

In March 2017 the Government of India issued transformative guidelines that include specific attention to the needs of elderly women.

**Women and Adolescent girls**

Existing gender inequalities, the lack of participation in decision-making and inadequate and inappropriate sanitation facilities have left the “right to sanitation” out of women and adolescent girls’ reach.

Sanitation and hygiene facilities without adequate washing, changing, drying and disposal facilities for menstruating women and girls ignore their very real, practical needs.

Many adolescent schoolgirls reported waiting until they returned home before changing sanitary materials, since schools did not have appropriate and clean facilities for changing and disposing of soiled materials or handwashing. Missing school during menstrual periods is a common coping strategy among adolescent girls, especially across Afghanistan, as well as in India, Bangladesh and Nepal.

Women with disabilities feel more vulnerable during pregnancy and menstruation. They depend on other people to help them with cleaning and changing of pads/cloth, which leads to irregular and poor hygiene management. They are also more vulnerable to sexual and verbal abuse. One of the participants in Warangal, Telengana

India narrated the case of a mentally challenged woman, who was unaware of men staring at her while she was defecating in the open.

Women also do not have a say in the financial decisions of their homes, so in most countries, they are unable to ensure the presence of a toilet, even if they feel the need for it.
The WASH practices of sanitation workers and waste collectors are determined largely by their working conditions as they spend many hours of the day and night clearing garbage, maintaining the cleanliness of streets, roads and other public areas. The responsibility of ensuring that the city is clean falls on their shoulders. Sanitation workers are employed by a municipal corporation or by any private contractor responsible for the collection and disposal of garbage. Waste collectors or rag pickers, as they are commonly known, are involved in the collection of rags or recyclable materials that can be found at dumpsites, landfills, riverbanks, street corners, or in residential areas. They usually collect materials such as plastics, bottles, cardboard, tin, aluminum, iron, brass, and copper, which can be sold for money.

The lack of water and sanitation facilities at the workplace forces waste collectors to defecate in the open. They also do not have any handwashing facilities and need to carry their own water for drinking and cleaning purposes. Many reported having to eat with dirty hands amidst the garbage or staying hungry the entire day until they return home and can wash up.

The situation is no different in their homes, especially in India, Pakistan, Nepal and Bangladesh. Most of them live in slums with community toilets, plagued by poor drainage, erratic water supply and poor maintenance. Due to irregular water supply, many of them are unable to take a bath daily, making it difficult to practice good hygiene regularly. Maintaining menstrual hygiene for women is especially challenging due to lack of space and privacy for changing their sanitary material. In Gandhinagar, India, waste collectors often live on illegally occupied land and do not want to invest scarce resources in toilet construction as the land does not belong to them. However, women waste collectors in the same city prioritized their sanitation needs and used their savings in constructing a toilet even though they run the risk of being relocated.

Sanitation Workers and Waste Collectors

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“Because we do a dirty job and belong to the harijan caste (low caste), we are looked down upon as untouchables. People don’t take anything given from our hands”—Shankar Mukhi, Saraikela, Jharkhand, India

“As part of our work we sweep, pick up garbage, clean drains and pick up dead animals. The dead animals smell real bad. We don’t get a mask, gloves or shoes to cover ourselves. If people can’t bear the dirty smell, imagine what we have to bear while picking up a dead dog” —Shankar Mukhi, Saraikela, Jharkhand, India
Challenges related to poor WASH services are exponentially higher for sanitation workers and waste collectors than the average citizen, as they usually work in extremely unhygienic and toxic environments, such as landfills, latrine pits, septic tanks and blocked drains in cities and towns. Across the region, with the exception of the Maldives, sanitation workers and waste collectors faced problems of inadequate safety and protection measures, such as face masks, gloves, boots and even cleaning equipment like shovels, brooms and bins. In Afghanistan, sanitation workers reported receiving gloves and boots; however, they still did not have facemasks and were frequently exposed to toxic gases from decomposing garbage.

Sanitation workers tend to travel in the same trucks that carry garbage, which includes dead animals and other decomposed, foul-smelling waste. There is no protection from injury, which often occurs while sorting through various hazardous materials like broken glass, sharp objects and even infected hospital waste that is mixed with the general waste. Waste collectors also handle soiled sanitary napkins and babies' nappies that are often thrown. Collection of waste in the rainy season is especially problematic, as the wet and moist environment provides fertile ground for maggots and other worms to flourish, making it extremely difficult for sanitation workers and waste collectors to conduct their jobs. The stench is often so overwhelming that the men sometimes take refuge in cheap alcohol.

Apart from the indignity of such work, it can also be extremely dangerous. Climbing into blocked gutters and drains in order to clean them manually exposes sanitation workers to high pressure methane gas and the risk of explosions and fatal accidents. Skin diseases, respiratory disorders, diarrhea, fevers, headaches and other frequent bouts of illness are common among sanitation workers and waste collectors. The excessive weight of handcarts, bags and manual transportation of these wastes also causes back pain and joint aches.

Not only do they work under hazardous conditions, they also do not have any financial and social security. Wages are low, work hours long and irregular, and there is an extra workload due to shortage of manpower, especially in India, Nepal, Pakistan and Bangladesh, where sanitation workers are employed on a contract or temporary basis. Literacy rates of sanitary workers are very low, with the majority of them illiterate.

Some waste collectors, as seen in Sri Lanka, have begun to purchase safety gloves and soap for handwashing and bathing, as they understand the risks.

They also tend to use toilets in houses near their working area. In Gandhinagar, India waste collectors reported using remains of soap found in the garbage.

In the absence of facemasks, women use their dupatta (scarf worn on the heads and shoulders), sari ends or pieces of cloth to cover their faces to avoid the stench and toxic gases. Sometimes, workers make their own cleaning equipment, such as brooms, when they have run out of equipment.

**Transgender**

Bangladesh and India is highly vulnerable due to social prejudices that deny them their human rights. They are subjected to discrimination, harassment, sexual and physical violence. They are often rejected by their own families and have to live on the streets. Some of them leave home of their own accord since they do not want to cause their family members any social embarrassment.

Due to social prejudices, it is difficult for transgenders to find rental housing and they end up living in highly congested areas with few toilets. Those who find shelter with a guru share a toilet with over 30 people and thus prefer defecating in the open. They report harassment, discrimination, prejudice and violence at the hands of the police, their own family members, community members and their clients, since they are mostly engaged in sex work or beg at traffic lights for a living.
Since their work is often considered illegal, it usually takes place in deserted places, such as graveyards and dump yards where there are no toilets. Participants reported defecating under trees, behind bushes or parked vehicles.

Even when there are public toilets, the transgender community is not allowed to use them. Public toilets are either for men or women and transgender people are not welcome in either, since it is widely believed that they are seeking sex work when they visit public toilets. When they use the men's toilet, they are subjected to sexual harassment and sexual violence. Most transgender women prefer to use the ladies' toilet; however, they report that women get scared when they see a transgender in the toilet and start abusing them. To avoid such situations, many of them cover their faces with a dupatta (scarf worn on the head and shoulders) when they enter a women's toilet or they delay going to the toilet till they can find a more private place. To address this issue, the government of Tamil Nadu in India has made provision for separate toilets in public spaces for the transgender community.

“I used to live with friends near Karimnagar town. About 15 of us were living in one room without any toilet facility. In order to relieve ourselves in the mornings, we used to go to the toilets in the Apsara theatre next door. However, after a while, the security guard realized we were using the theatre toilets and brought this to the notice of the owner. The owner had the toilets locked during the morning hours. When we confronted him, he replied that he did not want the public to think the theatre was a ‘transgender adda (den)’ and told us to stop coming. Often we are mistaken for seeking sex work when we visit public toilets”—Sheila, Hyderabad, Telangana, India.

Key demands of all the groups

1. Adolescents, women, the infirm, elderly and disabled people, transgender individuals, sanitation workers and waste collectors consulted were unanimous that users should be consulted by the organizations responsible for building WASH facilities; so that they can take into account the specific needs and concerns of marginalized groups.

2. In the case of community toilets, the community must be involved not only in giving design inputs, but also in developing operation and maintenance plans. Consultation participants felt that community ownership is imperative to ensure sanitation facilities remain clean and usable. Moreover, they demanded a budget provision at local level for maintenance of these facilities.

3. Consultation participants highlighted the importance of raising community awareness on the need for sanitation, and hygiene, as well as menstrual hygiene management, so that they can demand their rights to water and sanitation.

4. All the different groups consulted spoke about stigma and discrimination: Stigma because they were old and infirm, could not walk far and fast. Stigma because they were women or girls bathing or defecating in the open because they had no toilets. Stigma because it was difficult to properly use or clean toilet seats if hearing or visually impaired. Stigma because one’s livelihood means long days in rubbish dumps, inside drains or in dusty streets. Stigma for one’s gender and sexual orientation. Stigma for being poor, from another caste, gender or age. All groups spoke in their own way about the need for respect, in order to live and work with dignity and security.
Who is a Swachhagrahi?

Swachhagrahis are the foot soldiers of the Swachh Bharat Mission (Gramin) and the motivators for bringing about behavior change with respect to key sanitation practices in rural India.

A Swachhagrahi is a volunteer (preferably a woman) from any background including a local ASHA worker, ANM, Anganwadi worker and staff water line man, pump operator, member of CSOs/Youth organization or from the general public living in villages.

Roles of Swachhagrahi in ODF Sustainability

As per clause 2.3 under the heading sustainability, as detailed out in MDWS Circular (No.-S-11011/1/2018-SBM, dated 07.08.2018), the role of Swachhagrahis during sustainability phase of SBM are as follows:

Retrofitting and improvisation of assets

• Geo tag the toilets constructed
• Assist in construction/retro-fitting of defunct or poorly built HH and institutional toilets in the villages
• Communicate about financing options for use for the up gradation of sanitation, hygiene and bath facilities in homes so that Households can develop better quality facilities.

Reinforcing Improved Behaviours

• Conduct ODF verifications of the village: First verification, second verification and subsequent sustainability verifications
• Assist GP functionaries in organizing functions/ events to commemorate ODF status- regular ODF Days, celebration on Independence Day/ Republic Day
• Ensure continued functioning of the village Nigrani Samiti, organization of ratri chaupals, village meetings on the issue of cleanliness
• Ensure institutionalization of ODF approach in the village through ODF branding in the village, resolutions passed in Gram Sabhas, construction of Model toilets etc.
• Promote community-level water conservation to ensure availability of water for use in toilets
• Organise awareness programmes in institutions such as schools and AWC regarding the sustainability of ODF status of the village

Operations and Maintenance

• Raise awareness about proper operation and maintenance of toilets (O&M) including correct ways of emptying compost from toilet pits by the members of the household themselves
• Operation and maintenance of toilets in institutional buildings viz. schools, PHCs, community toilets and sanitary complexes, Anganwadi centres
Roles of Swachhagrahis – Incentive Structure Post – ODF

For sustaining ODF status of the village, Swachhagrahis will undertake the following activities and may receive payment from IEC budget subject to confirmation on achievement of the same:

<table>
<thead>
<tr>
<th>S.N.</th>
<th>ACTIVITIES</th>
<th>ALLOWABLE PAYMENT OF INCENTIVE</th>
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<tbody>
<tr>
<td>1</td>
<td>Geotagging of each toilet in the village</td>
<td>Up to Rs. 5/ toilet</td>
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<tr>
<td>2</td>
<td>First Verification of each household in the village (within 3 months of ODF declaration of the village) along with IPC/IEC activity to ensure community awareness and participation leading to ODF (S) sustenance</td>
<td>Up to Rs. 10 per household (verification and IPC)</td>
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<tr>
<td>3</td>
<td>Second verification/ subsequent sustainability verification of each household (within 9 months of ODF declaration of the village) along with IPC/IEC activity to ensure community awareness and participation leading to ODF (S) sustenance</td>
<td>Up to Rs. 15 per household (verification and IPC)</td>
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<td>4</td>
<td>Ensuring conversion of household’s dysfunctional toilet to functional toilet</td>
<td>Rs. 25/ toilet</td>
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<tr>
<td></td>
<td>Repair of broken pan</td>
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<td></td>
<td>Choked pipes</td>
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<td></td>
<td>Blocked drains</td>
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<td></td>
<td>Broken doors / walls / roof etc.</td>
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<td>5</td>
<td>Ensuring retrofitting of previously constructed toilets (as per safe technology)</td>
<td>Rs. 25/ toilet</td>
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<td></td>
<td>Addition of a second pit to a single pit toilet</td>
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<td></td>
<td>Construction of soak pit with septic tank</td>
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<td>Construction of separate pits for in situ toilets etc.</td>
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<td>6</td>
<td>Ensuring following SLWM activities in the village and creating public awareness on the operation and maintenance of the assets created</td>
<td>Rs. 200 per village (assuming the village will comprise of 50-100 households)</td>
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<tr>
<td>S.N.</td>
<td>Activities</td>
<td>Allowable Payment of Incentive</td>
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<td>7</td>
<td>Ensuring activities for visual cleanliness in the village</td>
<td>Rs. 200 per village (assuming the village will comprise of 50-100 households) per activity</td>
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<tr>
<td></td>
<td>Maintenance of drains (monthly)</td>
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<td></td>
<td>Maintenance of bio gas plants (monthly)</td>
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<td></td>
<td>Cleaning of ponds, drains, streets, local markets, etc. - fortnightly.</td>
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<td></td>
<td>Early morning/evening Nigrani, along with the other Nigrani Samiti members - weekly.</td>
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<td></td>
<td>Organizing Ratri Chaupals/village meeting on the issue of Swachhata/ODF sustainability - monthly</td>
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<tr>
<td>8</td>
<td>Facilitating ODF sustainability activities</td>
<td>Rs. 200 per village (assuming the village will comprise of 50-100 households) per activity</td>
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<td></td>
<td>Repair and cleanliness of toilets in institutional buildings Schools, PHCs, community toilets and sanitary complexes, Anganwadi centres - monthly basis.</td>
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<td></td>
<td>Observance of days of national importance viz. Independence Day, Republic day as well as ODF day/ Swachhata day to commemorate the ODF status of the village.</td>
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<td></td>
<td>Construction (one time) and maintenance (monthly) of Model Toilet at GP level</td>
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<td></td>
<td>ODF branding in the village- wall writings, erection of display board/plaque announcing the ODF status of the village</td>
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<td></td>
<td>Passing of resolution in the Gram Sabha for the following:</td>
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<td></td>
<td>• ODF declaration of the village</td>
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<td></td>
<td>• ODF verification of the village</td>
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<td></td>
<td>• Post -ODF declaration, any new families/</td>
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<tr>
<td>9</td>
<td>Facilitating self - construction of toilets by any new families / HHs post - ODF declaration of the village</td>
<td>Rs. 25/ toilet</td>
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</tbody>
</table>

**Non-Financial Incentives**

- Recognition by Government at different levels
- Felicitation by different public and private organisations (e.g.)
- Some creative rewards, such as:
Pledge

The pledge may be facilitated by the facilitator or any one from the participants who has been active/articulate and looks enthusiastic to do so. The session may be ended with the following pledge:

Mahatma Gandhi dreamt of an India which was not only free but also clean and developed. Mahatma Gandhi secured freedom for Mother India. Now it is our duty to serve Mother India by keeping the country neat and clean.

- I will do my best to protect Earth and its natural environment. I will also adopt such practices that would minimize wastage.
- I will reuse what I can
- I will take care of clean up the environment
- I will reduce the waste we create
- I will refuse plastic carry bags. I will use cotton/jute bags instead of plastic carry bags; I will use earthen cups, leaf plates instead of thermocol and plastic ones
- I will segregate solid waste at HH level into three categories namely biodegradable, non-biodegradable and hazardous waste
- I will make compost from biodegradable waste
- I will ensure recycling of non-biodegradable recyclable waste by providing it to scrap dealers directly or through SHG or Gram Panchayat
- I will not burn the waste, particularly plastic waste
- I will plant more trees
- I will conserve energy and water

I will break the silence on menstruation. I will take pride and will spread the word outside and inside the home.
WSSCC is a United Nations-hosted organization dedicated to advancing Sustainable Development Goal (SDG) Target 6.2 on sanitation and hygiene. Established in 1990, WSSCC is devoted to sanitation and hygiene, paying special attention to the needs of women, girls and people in vulnerable situations. In collaboration with members in 150 countries, it advocates for the billions of people worldwide who lack access to adequate and equitable sanitation, shares solutions that empower communities, and operates the Global Sanitation Fund which, since 2008, has committed over US$ 119 million to transform lives in developing countries.