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A toolkit for district-level officials on Greywater Management

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officials on Greywater
Management**

Index

Chapter 1: About the Toolkit	1
1.1 Purpose and Target Audience of the Toolkit	1
1.2 Structure of the Toolkit	1
Chapter 2: Guiding Principles of SLWM: SBM (G) Phase-II	2
2.1 Greywater Treatment	2
2.2 Funding	3
Chapter 3: Greywater Management: Implementation in Rural Areas	5
3.1 Decision Support Matrix Technology Options for Greywater Management	5
Chapter 4: Major Functions and Functionaries	11
4.1 Major Functions at District Level	11
4.2 Roles of Block Officials, GPs and Households in Management of Greywater	14
Chapter 5: Operation and Maintenance	16
5.1 Introduction	16
5.2 Operation and Maintenance of Community-level Treatment Units	17
5.3 Operation and Maintenance of Conveyance Systems	18
5.4 Grievance Redressal Mechanism	18
5.5 Record Maintenance	19
Chapter 6: Monitoring	20
6.1 Introduction	20
6.2 What is to be Monitored at GP Level?	20
6.3 What is to be Monitored at Block/District Level?	20
6.4 Key Indicators of Monitoring Greywater Management Activities	21

CHAPTER 1

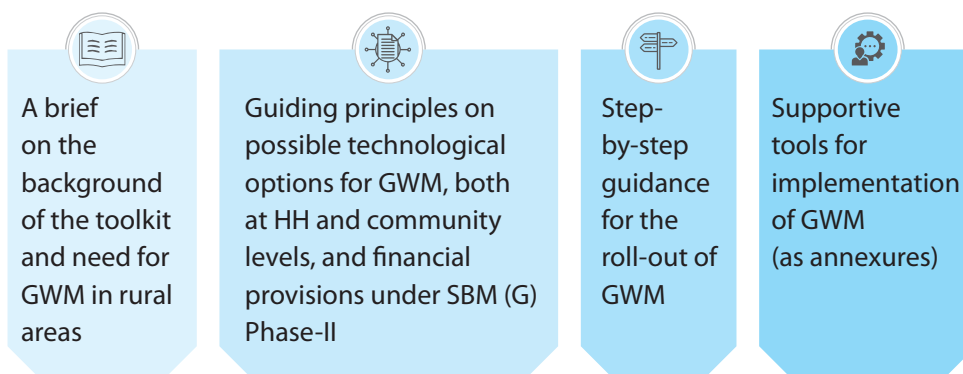
About the Toolkit

1.1 Purpose and Target Audience of the Toolkit

The main purpose of this toolkit is to provide step-by-step guidance to district/block/GP-level functionaries in planning, implementing and monitoring activities related to greywater management. This toolkit sets out all connected sub-activities, responsibilities, and key specifications, where required. It also provides a few indicative tools for officials to use during the implementation of greywater management activities.

1.2 Structure of the Toolkit

This toolkit is divided into four sections:



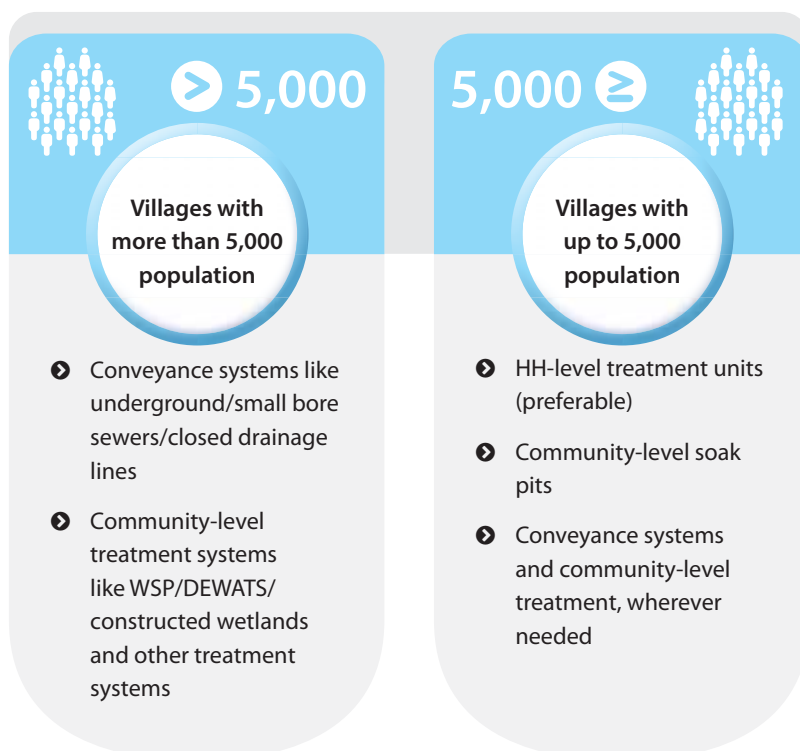
CHAPTER 2

Guiding Principles of SLWM: SBM (G) Phase-II

The central government released the guidelines for Swachh Bharat Mission (Grameen) Phase-II in February, 2020. According to the guidelines, effective management of liquid waste by at least 80 per cent of households is one of the key objectives of this phase.

2.1 Greywater Treatment

Figure 1: Treatment Options for Greywater





2.1.1 Greywater Treatment in Villages with more than 5,000 Population

As per the SBM (G) Phase-II guidelines, treatment options like WSP/DEWATS/constructed wetlands, etc., and conveyance systems should be preferred. These villages should plan for:

- Conveyance systems like underground/small bore sewers/closed drainage lines
- Treatment systems like WSP/DEWATS/constructed wetlands, etc.

SBM (G) Phase-II guidelines recommend treatment of greywater at the place nearest to the point of generation. The districts, blocks and GPs should, therefore, promote household-level treatment units like soak pits, leach pits, kitchen gardens for greywater management. Such decentralised systems involve low capital cost, low operation and maintenance cost and are also easy for members of households to maintain. Such systems do not require centralised spaces.

2.1.2 Greywater Treatment in Villages up to 5,000 Population

In smaller GPs/villages, more decentralised and household-centric approaches like individual soak pits/leach pits/magic pits/kitchen garden are more feasible and preferred. In such villages, household-level treatment units will be set up as far as possible. In cases where such household-level units are not possible, group-level/community-level units will be prescribed.

With additional funds granted under the 15th FC and through convergence with other state funds, states, districts and GPs shall have the flexibility to take up conveyance and treatment systems for smaller villages as well, depending on the agro-climatic factors. For larger villages having a population of less than 5,000, community-level soak pits may be planned based on the terrain, groundwater level and population density.

2.2 Funding



For successful implementation of SBM (G), robust financial planning, timely funding, mobilisation of adequate resources and prudent utilisation of funds are extremely important. The possible funding resources for greywater management activities are given in Table 1.

Table 1: Financial Provisions for Greywater Management According to SBM (G) Phase-II

Components		Financial assistance	
		Village size	Financial support
GWM activities	Village-level GWM activities	Up to 5,000 population	GWM: Up to Rs. 280 per capita
		Above 5,000 population	GWM: Up to Rs. 660 per capita
	District-level GWM activities		Note: 1. 30 per cent of this amount will be borne by the GPs from their 15 th FC grants; 2. Each village can utilise a total of Rs. 1 lakh based on their requirements for both solid waste and GWM
IEC and capacity building		Up to 5 per cent of the total funding for programmatic components (up to 3 per cent to be used at state/district levels and up to 2 per cent at central level)	
Flexi funds		States can use flexi funds as per Ministry of Finance guidelines issued in this regard from time to time for innovations/technology options at the state level to meet the local needs and requirements within the overall objective of the scheme	

2.2.1 Business Models/CSR Projects

Commercially viable solutions for greywater management can make the sanitation economy attractive to private businesses. In addition, this will result in revenue generation opportunities for community organisations. Interventions based on remunerative models and on the principles of cost-sharing, cost recovery and revenue generation need to be promoted.

Incentive and funding mechanism

Swachhagrahis will be given an incentive for each activity against successful completion of any allocated activities after due verification of the photographs of the activity along with the capturing of the date, time, geographical co-ordinates and total duration of the activity.

CHAPTER 3

Greywater Management: Implementation in Rural Areas

3.1 Decision Support Matrix Technology Options for Greywater Management

Villages should consider the following decision support matrix to identify interventions that would be needed for implementation of greywater management in their villages.

Figure 2: Greywater Management Technologies

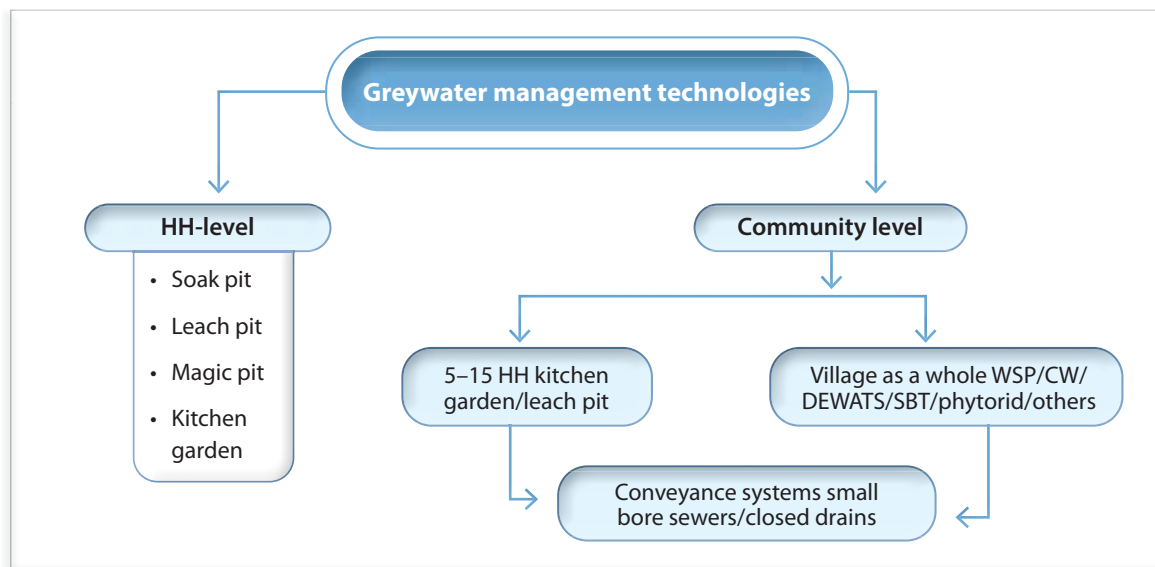


Figure 3: Technology Options for Permanent High Water Table/Water Logged Areas

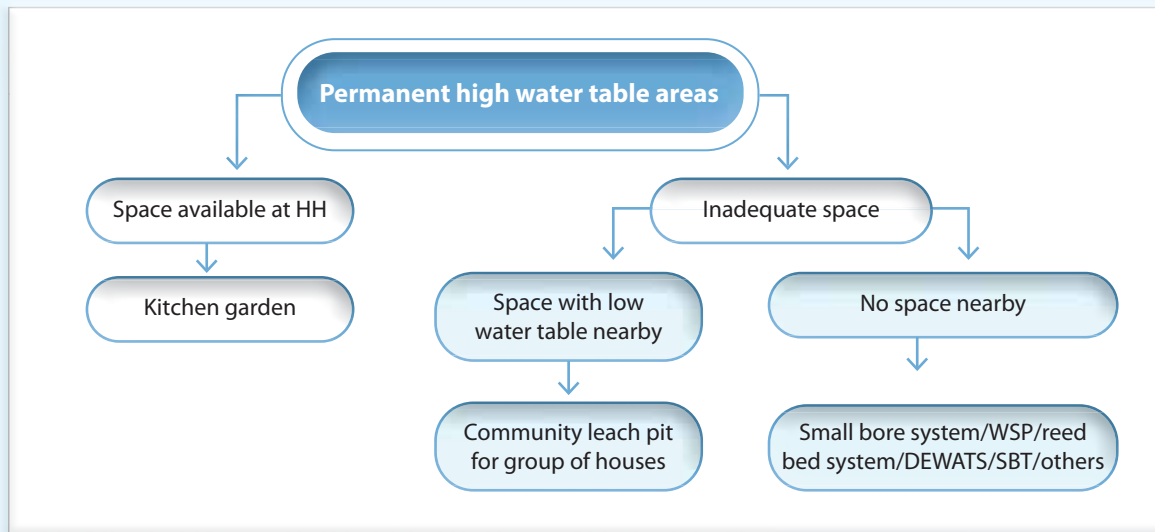


Figure 4: Technology Options for Hard Strata Areas

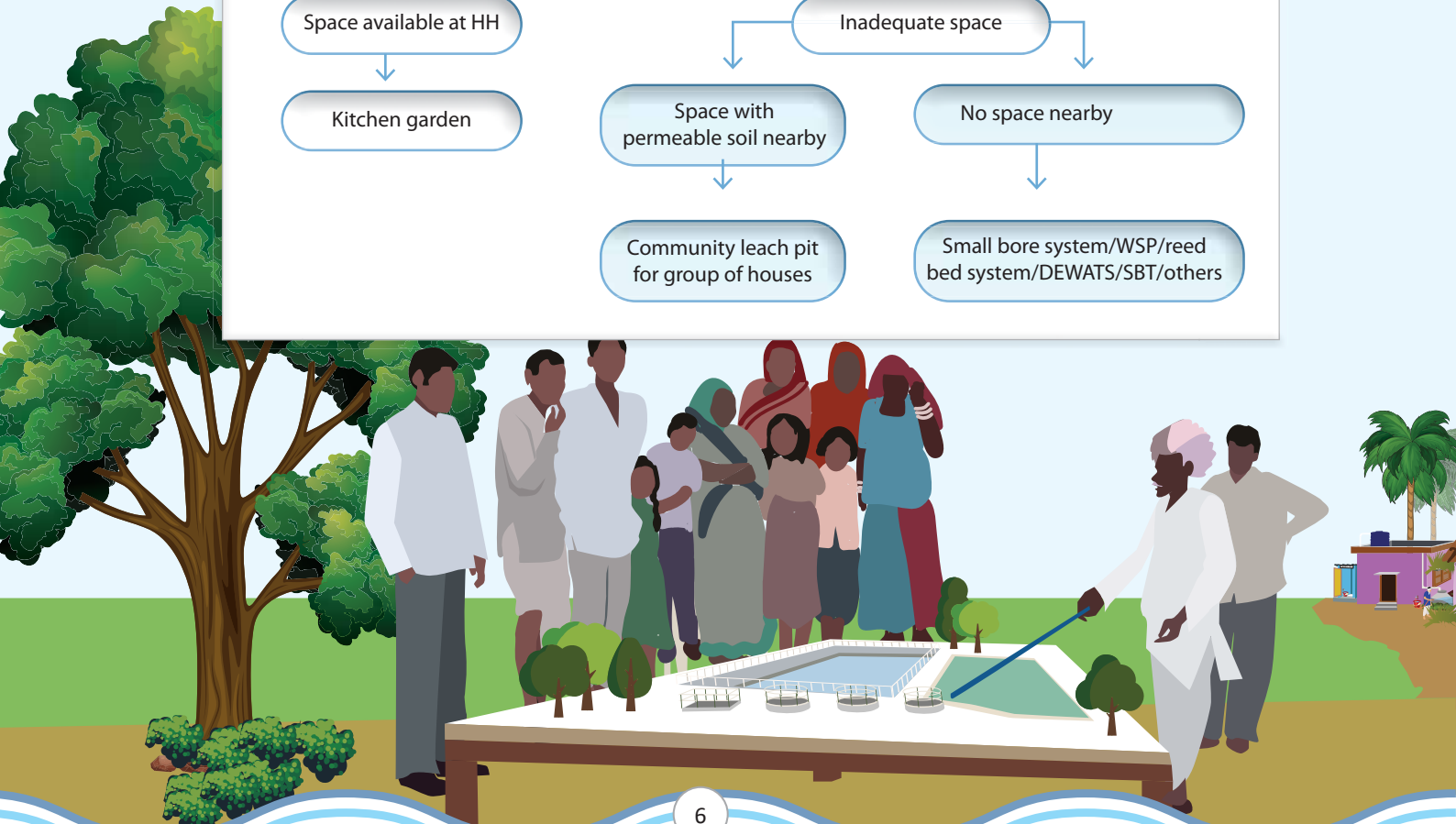
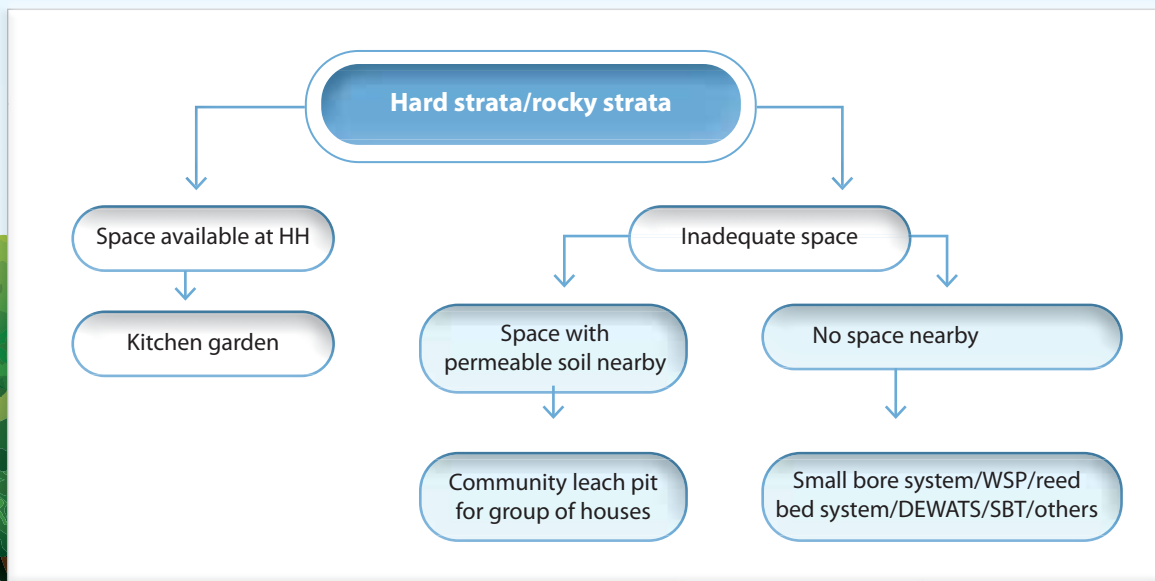
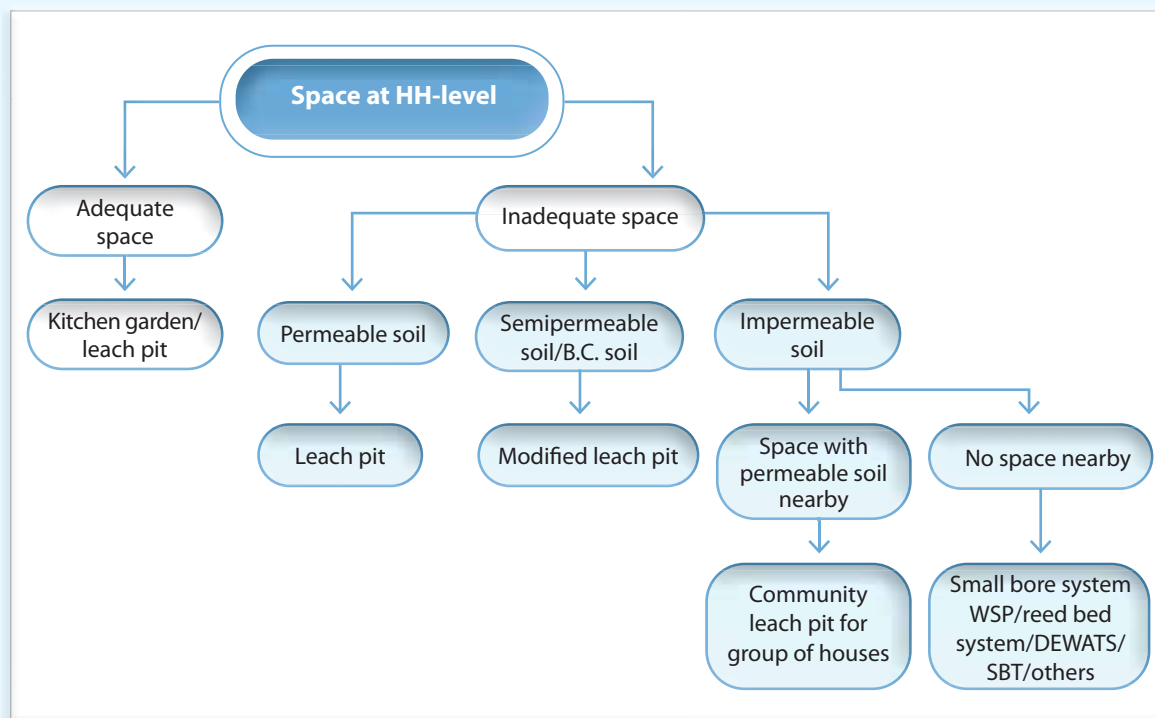


Figure 5: Technology Options for Other Areas



Details of each of the above technologies are provided in the technical manual on greywater management.



Each village should develop a village-level plan for greywater management

The Village Action/Swachhata Plan (VAP/VSP) should cover the following aspects of greywater management:

- Existing number of households connected to household-level treatment units
- Details of existing conveyance systems, if any
- Number and details of community-level greywater treatment units
- Number of households that need to be connected to household-level treatment units
- Number of households that need to be connected to community-level treatment units
- Quality of the greywater generated so that community treatment facilities may be planned
- Availability of land for development of community treatment facilities
- Requirements for conveyance systems
- Estimated amount of greywater generated
- Details of greywater reuse and recharge, if any
- Funds received for greywater management and expenditure

Table 2: Checklist for GP-level implementation for Greywater Management

A	Situation analysis	
1	Whether all HHs are connected to HH/community-level greywater treatment units?	(Yes/No)
2	If no, what is the number of HHs that are not connected to HH/community-level greywater treatment units?	_____
3	How many HHs have HH-level greywater treatment units?	Soak pits _____ Leach pits _____ Magic pits _____ Kitchen gardens _____
4	How many community-level greywater treatment units are there in the GP?	
6	Type of conveyance system in the GP	

7	Length of the conveyance system	_____meters				
8	Length of drainage lines that are silted	_____meters				
9	Length of drainage lines that need repairs	_____meters				
10	Amount of greywater reused	_____litres				
Details of greywater reuse						
11	Sr. No	Purpose				
		Quantity of greywater reused				
		_____litres				
		_____litres				
		_____litres				
B Planning for GWM						
1	Number of HHs that need to be connected to HH-level greywater treatment units					
2	Number of HHs that need to be connected to community-level greywater treatment units					
3	Length of additional conveyance lines required					
Please provide details about greywater treatment units required						
6	Sr. No.	Location of the proposed treatment unit	Treatment technology proposed	Number of HHs proposed to be connected to the unit	Treatment capacity of the unit (litres/day)	Amount of greywater proposed to be treated per day (litres)
Location of the proposed treatment unit						
Treatment technology proposed						
Number of HHs proposed to be connected to the unit						
Treatment capacity of the unit (litres/day)						
Amount of greywater proposed to be treated per day (litres)						
Financial details						
11	Amount of funds received for GWM in financial year_____					Rs._____
	Amount of funds spent on GWM in financial year_____					Rs._____
	Amount of GWM funds unspent in financial year_____					Rs._____

3.1.1 Block-level Plan for Greywater Management

The block-level plan for greywater management should include the following:

- Number of GPs where greywater management has been initiated
- Compilation of the status of greywater management in all GPs of the block
- Detailed plan preparation for IEC activities to be conducted
- Detailed plan preparation capacity building exercise to be conducted with various stakeholders
- Financial plan based on the plans prepared

Indicative business models

- Creation, operation and maintenance of waste stabilization ponds to be outsourced to private operators
- Outsourcing operation and maintenance of greywater management system to private operators
- Involvement of SHGs/VOs, etc., wherever feasible
- Local entrepreneurs, SHGs, youth groups, etc. can be encouraged to take up various activities pertaining to management of greywater and marketing of its by-products

CHAPTER 4

4.1 Major Functions at District Level

The proposed district-level role for implementation of greywater management is mainly around providing support to GPs for planning, implementation and operation and maintenance of greywater management assets and systems. These are presented in figure 6.

Figure 6: Role of Districts in Greywater Management



The following table presents the role of districts in various phases.

Table 3: Role of Districts in Each Phase of Greywater Management

No	Key function	Key stakeholders at district level	Role of district
1.	Support in planning at GP level	District Swachh Bharat Mission Cell: District Coordinator of SBM (G), Assistant Coordinator (Tech.), Consultants, IEC Specialist, HRD and Capacity Building Specialist, M&E cum MIS Specialist, SWM Specialist, LWM Specialist; District Engineers; members of line departments, relevant district-level institutions, committees, etc.	<ul style="list-style-type: none"> ▶ Support GPs in preparation of village action/ swachhata plans in consultations with Sarpanch/ Mukhiya and Panch ▶ Prepare a GP implementation schedule and timetable ▶ Build capacity of concerned stakeholders for facilitation of the planning process at GP level ▶ Conduct IEC activities regarding need and importance of GWM and proposed activities under SBM (G) Phase-II at GP level ▶ Organise district-level meeting of concerned stakeholders for finalisation of targets and actions ▶ Finalise the financial plan for the proposed actions ▶ Document the VAP/VSP and its approval ▶ Hold coordination meetings with other departments
2.	Implementation		<p>Treat greywater:</p> <ul style="list-style-type: none"> ▶ Roll out the implementation plan at the GP level ▶ Assist GPs in choosing the best technology as per their situation ▶ Communicate with blocks regarding the block-level steps ▶ Provide technical support/capacity building to the GPs on construction and implementation
			<ul style="list-style-type: none"> ▶ Hold regular reviews to ensure that all HHs are connected to GWM facilities and greywater is not being discharged in the open ▶ Conduct inter- and intra-district/state exposure visit for village functionaries

No	Key function	Key stakeholders at district level	Role of district
3.	O&M		<p>Reduce use of freshwater:</p> <ul style="list-style-type: none"> ▶ Issue instructions to GPs regarding steps to be taken ▶ Conduct awareness campaigns and activities for importance of water and the use of fresh water ▶ Build capacity of local functionaries <p>Reuse and recharge greywater:</p> <ul style="list-style-type: none"> ▶ Conduct IEC activities for spreading awareness about the importance of and need for reuse and recharge of greywater ▶ Establish linkages for industrial /institutional/ irrigational reuse of greywater ▶ Build capacity of the GP and block functionaries ▶ Regularly review and monitor the amount of water reused/recharged and possible measures for optimised reuse ▶ Guide the GPs, if required
4.	IEC for GWM		<ul style="list-style-type: none"> ▶ Include IEC/communication plan in the district action plan ▶ Implement IEC activities for GWM as per the plan ▶ Provide funds required for implementing the IEC plan to blocks, GPs and/or agencies involved, under the IEC component ▶ Monitor IEC implementation in all GPs
5.	Capacity building (CB)		<ul style="list-style-type: none"> ▶ Prepare a capacity building calendar ▶ Identify and empanel resource persons/agencies ▶ Implement the training calendar as per schedule ▶ Monitor capacity building activities
6.	Monitoring		<ul style="list-style-type: none"> ▶ Support GPs for undertaking proper O&M of the treatment units through various working models developed at various GPs in the country ▶ Maintain records at various levels ▶ Monitor various GWM-related activities in the district ▶ Monitor the wastewater quantity and quality for better sustenance ▶ Identify problem areas/issues regarding GWM ▶ Make necessary changes in the GWM systems/ practices to ensure proper functioning

4.2 Roles of Block Officials, GPs and Households in Management of Greywater

Table 4: Role of Households in Greywater Management

Level	Key stakeholders	Roles in management of greywater
Blocks	Block Coordinator and SLWM Coordinator of Block Water and Sanitation Committee	<ul style="list-style-type: none"> ▶ Hold a meeting with all GPs in the block and orient them on GWM provisions and principles ▶ Promote parallel implementation in all villages ▶ Identify villages/GPs that would need convergent action and support them plan together ▶ Undertake IEC activities at village and block levels ▶ Prepare block-level plans to support GPs in undertaking GWM ▶ Promote application of reduce, reuse and recharge of greywater ▶ Monitor the status and progress of activities for GWM
GPs/HHs		<ul style="list-style-type: none"> ▶ Judiciously use fresh water so that minimum quantity of greywater is generated ▶ Set up HH-level treatment units wherever feasible ▶ Maintain O&M of the HH-level treatment units ▶ Ensure discharge of HH greywater into conveyance system if applicable ▶ Support reuse of greywater for various purposes ▶ Organise greywater recharge wherever feasible

Table 5: Major Liquid Waste Management Activities that can be Financed Using 15th Finance Commission Tied Funds for Sanitation

Description of activities	Assets created
GWM system	Waste stabilization pond – 3-pond system
	Waste stabilization pond – 5-pond system
	Constructed wetland
	Decentralized wastewater treatment systems (DEWATS)
	Phytoid
	Duckweed pond

Description of activities	Assets created
O&M of GWM system	
Construction of drainage channel for management of liquid waste	Drainage channel
Construction of small-bore pipe conveyance system	Small-bore pipe system
Construction of silt, oil and grease chamber for pre-treatment of greywater before channelizing into community GWM system	Silt, oil and grease chamber
Construction of soak pits at individual HH-level for on-site GWM	Individual soak pit
Construction of common soak pits for a group of HHs for on-site treatment of GWM	Community soak pit
O&M of community soak pits	
Repair of drainage channels	
Drainage arrangements for transportation of wastewater from a group of villages to a common treatment unit	Drainage channel in multiple villages
Construction of waste settlement ponds for a group of villages	Waste settlement pond
O&M of multi village wastewater arrangements	
Drainage arrangements for transportation of wastewater from a group of villages to a common treatment unit	Drainage channel in multiple villages
Construction of waste settlement ponds for a group of villages	Waste settlement pond
O&M of multi village wastewater arrangements	

The Village Action/Swachhata Plan should cover the following aspects of greywater management:

- Existing number of households connected to household-level treatment units
- Details of existing conveyance systems, if any
- Number and details of community-level greywater treatment units
- Number of households that need to be connected to household-level treatment units
- Number of households that need to be connected to community-level treatment units
- Quality of the greywater generated to plan community treatment facilities
- Availability of land for development of community treatment facilities
- Requirements for conveyance systems
- Estimated amount of greywater generated
- Details of greywater reuse and recharge, if any
- Funds received for greywater management and expenditure

CHAPTER 5

Operation and Maintenance

5.1 Introduction

The operation and maintenance of greywater treatment units is a multi-faceted responsibility. It includes in its coverage the conveyance systems, the community-level treatment units, grievance redressal mechanisms and record maintenance protocol. The construction contract for any treatment facility should include operation and maintenance for five years as a mandatory condition.

The responsibilities for Operation and maintenance of various components of greywater management are presented in the table below:

Table 6: Operation and Maintenance Responsibility for Various Greywater Management Components

Sr No	Components of GWM	O&M responsibility
1	HH-level treatment units	HHs through their own funds
2	Group-level treatment units and conveyance systems	HHs concerned collectively
3	Community/GP-level treatment units	GPs through 15th FC funds, MGNREGS, business models/CSR
4	Community/GP-level conveyance systems	GPs through 15th FC funds, MGNREGS, business models/CSR

The operation and maintenance needs for various systems for greywater management are elaborated in the following sections.

5.2 Operation and Maintenance of Community-level Treatment Units

For operation and maintenance of greywater treatment units, the followings tasks need to be carried out:

At the household level

- Installation of screens into the drains coming out of the households
- Regular cleaning and removal of inorganic/unwanted materials from drains at the household level
- Maintenance of cleanliness and hygienic condition on the premises
- Removal of grit, dirt, plastic, paper, etc. from the drains where the household drain is connected to the drain outside the house

At the community level

- Installation of screens, etc. for removal of inorganic/unwanted materials like plastic, grit, paper, etc. as per the schedules
- Operation of treatment units as per the schedule prescribed by the technology provider
- Maintenance of conducive conditions in each unit as described by the technology provider
- Routine cleaning of the filter beds, aeration tanks, sludge holding tanks, etc., as applicable
- Operation of disinfection unit, optimisation of chemical dosage required as per the quality of incoming liquid
- Servicing and overhauling of all the electro-mechanical devices (pumps, motor, blowers, light fittings, control panel, etc.) as per the schedule
- Checking the efficiencies of all electro mechanical devices and relaying information to the authorities about any major repairs/replacements required
- Checking of all the civil structures for leakages, and adoption of corrective actions, if required
- Raking of screens in the screening chamber and disposal of screenings in an environmentally responsible manner, if applicable
- Replacement/replenishing of bio-media/culture as required
- Painting of the interior and exterior of the units as per the schedule
- Routine testing of effluent parameters like Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), pH, Total Suspended Solids (TSS), Total Nitrogen (T-N) and Total Phosphorus (T-P), etc. prior to discharge and adoption of corrective measures in case permissible values are exceeded

- ④ Contacting of agencies/local farmers for use of treated effluent for non-potable purposes like irrigation

5.3 Operation and Maintenance of Conveyance Systems

The operation and maintenance of conveyance systems includes:

- ④ Cleaning/de-siltation of all the drainage lines, chambers, manholes, etc. as per the schedule
- ④ Carrying out of minor repairs of the drainage lines like replacing broken sections, leakages in the lines and chambers, manhole covers, etc.
- ④ Adoption of corrective measures at locations where frequent blockages are observed, if applicable. (e.g., installation of a screen upstream of sections, any other possible intervention)
- ④ Major repair/replacement if required
- ④ Checking of the connections from toilets (black water), if any, and relaying of information to the authorities accordingly regarding the need for further action such as the initiation of disconnection from the network
- ④ Periodic checking of whether the house drains are connected to an inspection chamber with a screen prior to connection to the public drains

A list of repair service providers is required to be maintained at the unit to ensure timely repairs and maintenance of the system.

5.4 Grievance Redressal Mechanism

Mechanisms need to be set up through which the consumers can raise their complaints or grievances regarding greywater management services. The complaint or grievance resolution time frame needs to be drafted. The following options can be considered by the district for grievance redressal:

- ④ Maintenance of a register at GP/block/district offices wherein complaints may be registered



- Establishment of a helpline number where the consumers can register their complaints
- Use of online platforms like creation of social media groups, setting up of dedicated email addresses, establishment of portals, etc. where complaints can be registered

5.5 Record Maintenance

At the GP level, the Sarpanch/Gram Pradhan/Village Secretary and the Swachhagrahi will be responsible for maintaining the records, whereas at the district level, the liquid waste management (LWM) consultant, along with the data entry operator, will be responsible for maintaining the records. The following records need to be maintained and updated periodically:

➤ GP-level records

- ▶ Number of households with household-level treatment units
- ▶ Number of households connected to community-level treatment units
- ▶ Nature of conveyance systems
- ▶ Amount of greywater treated at the community-level units
- ▶ Volume of water reused for non-potable purposes along with the details of the farmer
- ▶ Farmer/agency using treated water
- ▶ Details of maintenance activities undertaken for the collection network
- ▶ Incoming and outgoing water quality parameters
- ▶ Log of complaints received and redressal measures taken
- ▶ Funds received for greywater management and expenditure, etc.

➤ District-level records

- ▶ IEC activities (number of IEC activities conducted, number of beneficiaries, number of villages covered, etc.)
- ▶ Capacity building activities (number of capacity building activities conducted, type of activities, number of beneficiaries, number of villages covered, etc.)
- ▶ Financial records
- ▶ Records of complaints and their redressal, etc.

CHAPTER 6

Monitoring

6.1 Introduction

Effective monitoring of outputs and outcomes will be a critical matter for focus in relation to ODF sustainability and villages with effective solid and liquid waste management arrangements. Monitoring helps to measure the overall implementation quality, progress and output of greywater management activities in the district. District officials are responsible for regularly monitoring these activities.

6.2 What is to be Monitored at GP Level?

- ❖ Village greywater action plan prepared
- ❖ Number of households covered in the action plan
- ❖ Number of households with greywater treatment units
- ❖ Number of households connected to the community-level greywater treatment unit
- ❖ Volume of water reused for non-potable purposes
- ❖ Absence of stagnant water in the village

6.3 What is to be Monitored at Block/District Level?

- ❖ Implementation of capacity building activities as per the plan
- ❖ Fund disbursement and its uses
- ❖ Number of GPs with household-level greywater management units
- ❖ Number of GPs with community-level treatment arrangements
- ❖ Number of GPs connected to household-level and community-level treatment units
- ❖ Number of blocks with greywater management

- Maintenance activities undertaken for conveyance systems and treatment units
- Effective convergence of government schemes
- Efforts towards private partnerships and revenue generation models
- Implementation of IEC activities as per the plan

6.4 Key Indicators of Monitoring Greywater Management Activities

Key indicators of monitoring greywater management activities are as follows:

No	Component	Key monitoring indicators
1	Overall GWM	<ul style="list-style-type: none"> ▶ Number of GPs with GWM arrangements ▶ Absence of stagnant water in public places ▶ Number of blocks fully covered by GWM arrangements ▶ Details of the GWM arrangements
2	Reduce generation of greywater	<ul style="list-style-type: none"> ▶ Awareness campaigns and activities for reducing the use of fresh water
3	Greywater treatment	<ul style="list-style-type: none"> ▶ Number of HHs, institutions and public places with GWM facilities ▶ Application of HH-level treatment wherever possible ▶ Use of appropriate technology for GWM ▶ Details of O&M of the treatment units
4	Reuse and recharge of greywater	<ul style="list-style-type: none"> ▶ Amount of treated greywater reused and recharged ▶ Number and status of IEC activities conducted for reuse and recharge
5	Funding	<ul style="list-style-type: none"> ▶ Fund disbursement under SBM (G) Phase-II ▶ Use of funds disbursed under SBM (G) Phase-II ▶ Effective convergence of government schemes ▶ Activities for private partnerships ▶ Efforts for revenue generation models ▶ Amount of by-products generated, product-wise amounts sold, details of revenue generated
6.	IEC and community mobilisation	<ul style="list-style-type: none"> ▶ Number of IEC activities conducted ▶ Number of beneficiaries ▶ Number of villages covered
7.	Capacity building	<ul style="list-style-type: none"> ▶ Number of capacity building activities conducted ▶ Type of activities conducted ▶ Number of beneficiaries ▶ Number of villages covered
8.	O&M	<ul style="list-style-type: none"> ▶ Number of complaints registered ▶ Number of complaints addressed ▶ Maintenance of proper records



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एक कदम स्वच्छता की ओर