LIQUID WASTE MANAGEMENT SYSTEMS IN RURAL TAMIL NADU

RURAL DEVELOPMENT AND PANCHAYAT RAJ DEPARTMENT

GOVERNMENT OF TAMIL NADU
STATE PROFILE

- No. of Rural Districts: 36
- No. of Block: 388
- No. of GPs: 12,525
- No. of Habitation: 79,394
- Rural Population: 4.05 Crore
- No. of Rural HHs: 1.01 Crore
The State funded Solid Waste Management Scheme is being implemented in Tamil Nadu from 2015 onwards. All the **12,525** GPs in the State have been covered in 3-Phases.

- Phase I- 2,000 GPs,  
- Phase II-7,000 GPs &  
- Phase III – 3,525 GPs
The main objective of the SWM scheme is to

- Maintain the overall cleanliness of the Villages
- Safe disposal of the Solid Waste generated in the Villages

The scheme provides end to end SWM solution from

- Waste Collection,
- Transportation,
- Segregation,
- Safe Storage & Disposal of the waste collected.
- 66,310 ‘Thooimai Kaavalars’ are engaged in SWM activities.
SWM – INFRASTRUCTURE FACILITIES

All the GPs in the State have been provided with the following infrastructure facilities

- Segregation Cum Storage Shed
- Compost Pits (2) & Pit for Non-recyclable/Inert waste (1)
- Tri-Cycles, Street Garbage Bins, Cleaning Implements, etc.
- Vermi-Compost Units
- Plastic Waste Management units – 1 Per district.
GREY WATER MANAGEMENT IN RURAL TAMIL NADU
CHALLENGES AND NEED FOR GWM

In the absence of any viable treatment process, Grey water generated from Rural Households are disposed off into Open drain, Streets, Vacant land or into Water Bodies resulting in:

- Surface Water Contamination
- Land Contamination and
- Aggravated Water Borne Diseases.

Lack of suitable technological options, especially for rural areas was the greatest challenge in providing universal solution for managing the grey water.
FOR EFFECTIVE MANAGEMENT OF GREY WATER IN RURAL AREAS A SIMPLE & ADOPTABLE, SCALABLE, LOW COST, ENVIRONMENT FRIENDLY MODEL IS THE PRE-REQUISITE.

TN TEAM OF TECHNICAL EXPERTS AND OFFICIALS WAS SENT TO STUDY THE “MAGIC PITS” OF TELENGANA.


BASED ON IT’S SUCCESS THIS MODEL IS NOW BEING EXTENDED TO THE WHOLE OF TN IN A PHASED MANNER.
GWM IN RURAL TAMIL NADU

For taking up Grey Water Management in a big way, Detailed Guidelines with Type designs were issued by Government of Tamil Nadu MGNREGS during 2017-2018 for the construction of Individual and Community Soak Pits.
<table>
<thead>
<tr>
<th>Description</th>
<th>Target for FY 2017-18</th>
<th>Target for FY 2018-19</th>
<th>Target for FY 2019-20</th>
<th>Target for FY 2020-21</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual HH Soak Pits</td>
<td>1,75,000</td>
<td>1,75,000</td>
<td>1,75,000</td>
<td>1,75,000</td>
<td>7,00,000</td>
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<tr>
<td>Community Soak Pits</td>
<td>25,000</td>
<td>25,000</td>
<td>25,000</td>
<td>25,000</td>
<td>1,00,000</td>
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<tr>
<td>Community Soak Pit Horizontal Filter Type</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>300</td>
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<tr>
<td>Community Soak pit Horizontal Filter Type</td>
<td>0</td>
<td>400</td>
<td>400</td>
<td>400</td>
<td>1,200</td>
</tr>
</tbody>
</table>
## SOAK PIT MODELS & SUITABILITY

<table>
<thead>
<tr>
<th>Model</th>
<th>Suitability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Individual Household Soak Pits</strong></td>
<td>Suitable for managing grey water at Individual Household Level.</td>
</tr>
<tr>
<td><strong>Community Soak Pits for Common Places</strong></td>
<td>GWM Structures put up in places prone for water stagnation like Public Fountains, Hand Pumps, OHTs etc., and also for Clusters where there is no space for the construction of Individual HH Soak pits.</td>
</tr>
<tr>
<td><strong>Community Soak Pit Horizontal Filter type</strong></td>
<td>Constructed at disposal point of drainage systems. Suitable for Clusters with high Ground water table areas. The treated grey water can be used for agriculture purposes.</td>
</tr>
<tr>
<td><strong>Community Soak Pit Vertical Filter type</strong></td>
<td>Constructed at disposal point of drainage systems. Suitable for Clusters with low water table areas.</td>
</tr>
</tbody>
</table>
## SOAK PIT MODELS & UNIT COST UNDER MGNREGS (FY-2020-21)

<table>
<thead>
<tr>
<th>Model</th>
<th>Unit Cost (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Household Soak Pits</td>
<td>9,300</td>
</tr>
<tr>
<td>Community Soak Pits for Common Places</td>
<td>12,500</td>
</tr>
<tr>
<td>Community Soak Pit Horizontal Filter type</td>
<td>1,33,000</td>
</tr>
<tr>
<td>Community Soak Pit Vertical Filter type</td>
<td>1,27,000</td>
</tr>
</tbody>
</table>
INDIVIDUAL HH SOAK PIT – TYPE DESIGN

Dimensions: 1.20m(L) x 1.20m(B) x 1.80 m(D)
INDIVIDUAL HOUSEHOLD SOAK PIT

• This type of Individual HH Soak Pits can be easily Constructed with the locally available materials.
• Management of Grey water becomes more easy if treated at source.
• This in turn avoids the flow of grey water and stagnation in streets, open land, etc.
INDIVIDUAL HH SOAK PIT - COMPONENTS

- **Collection Pipe/ Collection Platform**: The Grey water Generated from Kitchen, Bathing, washing and other Household activities are collected.

- **Inspection Chamber**: Solids and other Floating materials suspended in the grey water gets filtered in the Inspection Chamber.

- **Soak Pit**: The grey water from the inspection chamber is connected to the Concrete tub placed in the soak pit where the suspended particles settle down and grey water overflows into the filter media where it gets filtered and safely percolates into the ground.
INDIVIDUAL HOUSEHOLD SOAK PITS
INDIVIDUAL HOUSEHOLD SOAK PITS
INDIVIDUAL HOUSEHOLD SOAK PITS
COMMUNITY SOAK PITS

• **Community Soak pits** are suitable for management of Grey water generated from **Public Fountains, Hand Pumps, Overhead Water Tanks, etc.**

• These soak pits can be constructed and connected to a number of households where there are space constraints for construction of Individual HH Soak pits.

• Community Soak pits are usually constructed at the disposal point of the drains.
COMMUNITY SOAK PIT – TYPE DESIGN

Dimensions: 1.50m(L) x 1.50m(B) x 1.80 m(D)
The Components of the Community Soak pits are similar to that of an Individual Household soak pits with slightly larger dimensions.

In case of Public Fountains/ Hand Pumps/ OHTs/ etc., a cement concrete platform is constructed around the structure for collection of water and connected to the inspection chamber.

The Grey water generated from the HHs are collected through a drainage channel and the outlet of this channel is connected to an Inspection chamber and then to the Community Soak Pit.
COMMUNITY SOAK PITS – CONNECTED WITH HAND PUMPS & OVERHEAD WATER TANKS
COMMUNITY SOAK PIT – CONNECTED WITH PUBLIC FOUNTAINS & MINI - WATER TANKS
Both the Horizontal and Vertical type Soak Pits are efficient Grey water treatment methods suitable for treatment of Grey Water generated from HHs and places with Space Constraints.

These soak pits are usually constructed at the discharge point of the drainage systems.

Horizontal type soak pits are suitable for places with high water table and the treated water can be recovered and reused for agricultural activities.

Vertical type soak pits consumes less land area when compared to horizontal type soak pits and can be constructed in areas with low water table, the treated water will helps to replenish the ground water table.
Dimensions: 4.46 m(L) x 3.46 m(B) x 1.45 m (D)
COMMUNITY SOAK PITS
HORIZONTAL FILTER TYPE
Community soak Pit - Horizontal Filter type
COMMUNITY SOAK PITS
HORIZONTAL FILTER TYPE

Before

After

Difference in Appearance of Raw & Filtered Sewage
COMMUNITY SOAK PITS
HORIZONTAL FILTER TYPE

Before

After

Treasted Water
Community soak Pit - Vertical Filter

Dimensions: 4.46 m (Diameter) x 2.25 m (Depth)
COMMUNITY SOAK PITS - VERTICAL FILTER
COMMUNITY SOAK PITS - VERTICAL FILTER

Before

After
COMMUNITY SOAK PIT - VERTICAL FILTER
A Comprehensive “Handbook ON WASH” was developed covering the following aspects of

- SANITATION
- PERSONAL HYGIENE
- ODF SUSTAINABILITY
- SOLID WASTE MANAGEMENT
- LIQUID WASTE MANAGEMENT
- PLASTIC WASTE MANAGEMENT, ETC.
- HEALTH
- NUTRITION

• The Master trainers were trained on ODF Plus aspects at SIRD with the help of this Handbook, who in turn have trained the Swachhagrahis in their respective districts.
41. SOAK PITS FOR GREY WATER MANAGEMENT

Soak Pits play a significant role in facilitating the safe disposal of the waste water from households and run off water from the public water sources.

Waste water from kitchen and bathroom in the houses and run-off water from the public water sources like street taps, overhead tanks and hand pumps, gets stagnated in the open drainage. These are the main breeding sites for mosquitoes that spread diseases.

To prevent water stagnation within the household premises and in the drainage channels, Individual Household Soak Pits are provided under Mahatma Gandhi National Rural Employment Guarantee Scheme. Similarly, Community Soak Pits are constructed near Public Fountains, Overhead Tanks and Hand Pumps.

It also helps in recharging the ground water table.

Community Soak Pit Structure is similar to that of the Individual Soak Pit, but it is bigger in size.

Prevent stagnation of Grey Water in residential areas! Arrest the spread of diseases and lead a healthy life!!
Self Help Groups in Action
“Madurai Experiment”

• Madurai District is piloting a **Women only Construction Model** for the construction of HH Soak pits in the District by involving SHGs.

• Role of SHGs are
  – Convincing villagers on “Need for Soak Pits”
  – Identifying beneficiaries for soak pit construction
  – Nudging beneficiaries to own up construction
  – Coordinating purchase of raw materials
  – Construction of Soak Pits

• **1,243 women** have been trained on Soak pit construction.
SATURATION APPROACH PLANNING

- Conducting a **TRANSECT WALK** to identify and map the following in each Habitation
  - Areas having open drainages
  - Areas without drainage connectivity
  - Areas where grey water is drained into vacant land and water bodies
  - Low lying areas where rainwater stagnates

- Creating hand drawn **village level drainage maps** as a table top exercise and digitizing the same.
- Listing out households where **individual household Soak pits** needs to be constructed.
- Identifying areas where **community soak pits** need to be constructed.
- Identifying areas where **open drainages with proper gradient** need to be constructed to guide rainwater and common grey water to community soak pits.
Saturation Approach to LWM

Factors accounted for while deploying this approach

- Space availability around the house
- Soil condition of the village lanes
  - Clayey soil - not suited
  - Permeable soil - suited
- Water table level
  - High water table not suited
- Gradient of the village lanes
  - Drains along natural gradient better
- Availability of common space for community soak pits.
PILOT CONSTRUCTION IN T. PUDUPATTI GP

- T. Pallupati GP in Thirumangalam Block was initially chosen for a pilot study.
- Out of the 435 HHs in the V.Pt, **100 Beneficiaries** were identified and **10 teams were formed (4 Female+1 Male per team)**.
- Each team were given a target to complete **10 Individual soak pits** within a weeks time.
- With the support of the Beneficiaries the all the teams were able to construct 10 Individual HH soak pits within 6 days.
- Based on the success of this Model, this methodology is now being replicated in most of the Blocks of Madurai District.
WHAT WORKED IN FAVOUR OF SATURATION APPROACH

- Decentralized approach for Saturation of GWM system.
- Beneficiary and Community participation in various stages like Planning, Construction and Maintenance.
- Mobilising construction materials on a saturation approach resulted in operational efficiency and economies of scale.
- Mapping and Construction in continuous houses and contiguous streets resulted in labour productivity and efficient material handling.
BENEFICIARIES OF HH SOAK PITS
Basis of prioritizing GPs on Saturation Mode:

- GPs alongside the Polluted River stretches
- NGT Model GPs
- JJM GPs - for Source Sustainability
- GPs prone for water stagnation
- GPs having larger water bodies

2,070 Village Panchayat had been chosen in this FY 2020-21 for establishment of Grey Water Management facilities.

GWM facilities in these GPs will be established under SBM(G) in convergence with MGNREGS & Tied Component of 15th FC Grant.
Thank You!