WASH Flood Response and Recovery in Kerala - 2018 - 2019

Standard Operating Procedure For Rehabilitation Of Septic Tank

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Introduction:
The aim of this document is to explain the field level procedures in cleaning septic tanks and the safe disposal of sludge. There are very few Fecal Sludge Treatment Plants in Kerala. The floods of 2018 due to South West monsoon, caused a very great havoc in 13 districts of Kerala by inundating all the Wells and Septic tanks. The flood water mixed with faecal sludge and black water of the flooded septic tanks contaminated the wells causing health hazards.

UNICEF and the Government of Kerala associated with Gramalaya started the relief works in 5 most affected districts of Kerala. The local Panchayat authorities and the State Government authorities assisted the team in assessing the damages caused to the wells and septic tanks of the villages in Alappuzha, Ernakulam, Pathanamthitta, Thrissur and Wayanad.

A project was arrived to repair and retrofit the septic tanks and the wells contaminated by the floods and to create models of the method of cleaning and repairing the wells and the septic tanks.

Desludging Methods

The desludging method is divided into three parts and in each part several work pattern is explained.
<table>
<thead>
<tr>
<th>Important part</th>
<th>Important Sections</th>
<th>Important Needs</th>
</tr>
</thead>
</table>
| Part 1         | Desludging of Septage | 1. Survey of Toilets and Septic Tanks  
2. Desludging equipments  
3. Desludging team  
4. Methods of desludging and the nearest collection point  
5. Following of Safety and Hygienic methods. |
| Part 2         | Disposal of fecal sludges Offsite | Decanting of fecal sludge in the Fecal Sludge Treatment Plant. |
2. Execution of Onsite disposal of sludge. |
| Part 4         | Registering Statistical Details | Maintaining of records at all stages |

**Part 1 : Desludging of Septage**

**Step 1 - Survey of Toilets and Septic Tanks:**

- The Toilet and Septic tank in the flood affected area should be surveyed for the details as given in the survey format as per WHO guidelines.
- The pre and post flood scenario of the septic tank should be noted.
- The pre and post flood scenario of the wells and water level and damages caused by the floods should be recorded in the survey format.
- The cross-sectional drawing of the septic tank with details should be drawn with respect to some temporary bench mark established at site.
- The damages to the cover slabs placed on top of the septic tank and other damages are also to be noted in the survey format.
- Details of the air vent pipe also be noted down for any damages.
- Details of soak pit provided or not provided also to be noted.

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**Septic tank drawing with details**
### Survey Format for Toilets and Septic Tanks

**Table:**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Particulars</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>Cost of cleaning the septic tank</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Is the septic tank Abandoned?</td>
<td>Yes</td>
</tr>
<tr>
<td>30</td>
<td>Whether there is ex filtration chamber?</td>
<td>Yes</td>
</tr>
<tr>
<td>31</td>
<td>Whether the septic tank is damaged?</td>
<td>Yes</td>
</tr>
<tr>
<td>32</td>
<td>If Yes Specify</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Whether the septic tank is filled after flood?</td>
<td>Yes</td>
</tr>
<tr>
<td>34</td>
<td>Whether the septic tank has air vent pipe?</td>
<td>Yes</td>
</tr>
<tr>
<td>35</td>
<td>Still under usage after flood?</td>
<td>Yes</td>
</tr>
<tr>
<td>36</td>
<td>If Yes Specify</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Whether beneficiary is willing for field test?</td>
<td>Yes</td>
</tr>
<tr>
<td>38</td>
<td>Did the house hold have dug well?</td>
<td>Yes</td>
</tr>
<tr>
<td>39</td>
<td>Depth of water from ground level</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Distance between the septic tank and nearest dug well</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Distance between the toilet and septic tank</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Level difference between the toilet and septic tank(Height)</td>
<td>Yes</td>
</tr>
<tr>
<td>43</td>
<td>If Yes Specify</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>If No, give the details for selection</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Any other details</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Whether rough hand sketch of the household surveyed (Map) attached</td>
<td>Yes</td>
</tr>
<tr>
<td>47</td>
<td>Whether the map attached</td>
<td>Yes</td>
</tr>
<tr>
<td>48</td>
<td>Did the Photo of the well attached?</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Note:** The format is based on WHO Guidelines on Sanitation and Health.
Step 2: Observations

- Most of the houses have toilets in Kerala.
- Various types of Septic Tanks are used in the house holds.
- Most of them are using the two pit or three pit cylindrical rings for septic tank construction.
- The bottom of the rings are not plastered and it acts like a leach pit.
- The present septic tanks and leach pit type model in most of the places of Kerala are not constructed as per the specified models.
- The labours and the agencies engaged in support services of cleaning and transporting of fecal sludge are not following the specified safety methods.
- The toilets disposing their untreated sludge into open is equal to Open Defecation.

Step 3: Equipments used for Desludging operation

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Equipments</th>
<th>Important works</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Desludging pump</td>
<td>Hose pipes attached to a motorized pump is suitable. A strainer is to be attached to the foot valve of the hose</td>
</tr>
<tr>
<td>2</td>
<td>Tanks to transport fecal sludge</td>
<td>Tank attached sludge removing vehicles and accessories</td>
</tr>
<tr>
<td>3</td>
<td>Water tanks and Buckets</td>
<td>Plastic buckets are used for cleaning the equipments and washing hands after using chemicals.</td>
</tr>
<tr>
<td>4</td>
<td>Safety dresses</td>
<td>Workers engaged in removing fecal sludge and handling chemicals must compulsorily use Gloves and Gum Boots. The gloves and boots have to be thoroughly washed after use. The clothes used while sludge removal should be washed. Dirty clothes will spread germs and contaminate the house. The face mask will arrest the bad odour of the fecal sludge. Goggles have to be used compulsorily by those workers handling Chlorine and Lime.</td>
</tr>
<tr>
<td>5</td>
<td>Bleaching powder</td>
<td>Bleaching powder should be sprinkled around the septic tank</td>
</tr>
<tr>
<td>6</td>
<td>Lime</td>
<td>Hydrated Lime should be sprinkled around the places where the septage leaks during removal or sand to 2inches thickness can be filled. Lime should be sprinkled around the septic tank and toilet after removing the sludge. Care should be taken while handling lime as it is a hazardous chemical.</td>
</tr>
<tr>
<td>7</td>
<td>Equipments required for replacing cover of the septic</td>
<td>Sludge removing vehicle should be provided with sufficient equipments and workers. Sufficient number of workers should be kept ready for replacing the septic tank cover after removal of sludge.</td>
</tr>
</tbody>
</table>
Step 4 - Sludge Removing Equipments:
Equipments required for cleaning works of septic tank:
- Cleaning pump, Hose pipes, foot valve + Strainer.
- Sufficient number of Gum boots.
- High quality hand gloves.
- Safety Goggles.
- Sturdy Helmets.
- Disposable masks.
- Shovels
- Plastic buckets

Step 5: Workers
- Pump operator.
- Workers.
- Workers for removing and replacing the septic tank cover.

Part 2: Disposal of Fecal Sludges Offsite

Step 1: Removal of sludge
The panchayat employees and the workers engaged in sludge removal should be properly trained in the skills of cleaning of septic tanks.

Removal of septage from the tank:
- Arrangement should be made to make a clear way for the sludge to travel in the Hose pipe.
- The end of the hose pipe has to be placed properly at the bottom of the tank.
- Water is to be added to dissolve the fecal sludge, if found hard, for easy removal.
- The filled tank is to be transported to the nearest treatment site.
- 10% of the sludge is to be left in the tank after removing 90%. This will help the composting of the sludge with the bacteria present in the 10% sludge and the continuous usage of the toilet.
- Chlorine or Lime should not be added to the septic tank after cleaning. This would kill the live bacteria present in the remaining sludge.
- The removed cover of the septic tank should be replaced properly with cement mortar.
- The removed air vent pipe should be replaced properly with a mosquito net at the top to arrest mosquito and flies breeding.
- After replacing the cover of the septic tank Lime should be sprinkled around the septic tank on the leak of septage.
- Bleaching powder should be sufficiently sprinkled around the toilet and the septic tank.
Step 2: Safety and Hygiene arrangements:

All the sludge removing stages, safety and hygiene arrangements have to be compulsorily arranged.

- All the workers engaged in the septic tank cleaning work should be trained to follow safety and personal hygiene methods. The methods of sludge removal should be known to the workers. The basic knowledge of Faecal Oral Transmission process should be known.
- Separate dresses should be used while cleaning the septic tanks and they should be removed while going back to house.
- The clothes used while cleaning the septic tanks should be washed thoroughly.
- The supervising staff should have full knowledge about the sludge disposing site.

Step 3:

The workers should change their dresses after cleaning the septic tank and bathe using soap. Hands should be washed cleanly using soap before eating. The faecal sludge should not be handled without wearing proper gloves.

Transporting the sludge to the treatment plant:

If the Sludge Treatment Plant is not located near, the sludge should be transported in a closed tanker vehicle to the centralized Sludge Treatment Plant.

The workers should provide the following information to the Sludge Treatment Plant:

1. The date and time of removal of sludge.
2. The name of the place of removal of sludge.
3. The number of tanks of septage that can be emptied at the treatment plant.

The septage carrying vehicle should empty the sludge in the treatment plant with the help of the employees of the plant.
The drivers of the septage carrying vehicle should be instructed the following stages:

Accidental leakage of sludge:

a) A shovel and 2 bags of 25 kgs of Lime should be kept ready in the vehicle to meet the exigency of spilling of septage.
b) Lime powder should be sprinkled over the leak.
c) Sand up to 2 inches should be put on the leak of septage for the leaked septage will cause health hazard to the people.

If the septage is spilled, the following details have to be informed to the concerned:

Date, time and place where the slurry is spilled.
The amount of slurry spilled.

If the septage is spilled, the following details have to be informed to the concerned:

- Hygiene procedures of removing the septage and training on the Standard Operation Procedures.
- The driver of the vehicle should be aware of the Faecal Oral Transmitted diseases and the preventive measures.
- The knowledge about the procedures to be adopted in times of accidental spill of slurry should be spread among the driver and the workers in the vehicle.

Following things must be present in the vehicle

a) 1 Bathing soap
b) 1 Washing soap
c) 5 packets of ORS powder
d) 1 bottle household disinfectant.

Part 3 : Disposal of Fecal Sludges Offsite

Step 1 : Procedures of disposal of faecal sludge in a nearby place::

- A separate place has to be selected for the disposal of sludge. No water bodies like River, Lake, Tank, Pond should be found around 15 metres near the disposal site.
- A pit should be dug with sufficient length and breadth with a depth of 1.0m.
- The sludge removed from the septic tank should be emptied and cow dung or horse dung should be put in the pit.
- A layer of mud should be filled above the sludge to a height of minimum 30 cm. Marking should be made to notify the pit.
- The sludge will turn into manure in a period of 3 months.
• When there is no septage treatment plant nearby to dispose the septage from the septic tank a constructed wet land can be built in every panchayat level.
• A pit should be dug in a public place with 5 metres X 15 metres dimension of length and breadth.
• The floor of the pit should be provided a slope of 1:30 ratio.
• To pour the sludge, a small tank should be constructed at the entrance of the pit.
• Pebbles or crushed stones should be filled in the pit as shown in the diagram.
• Grass varieties like Reeds and Canna Indica should be planted above the bed.
• The water residue can be used for gardening and agricultural purposes.

- Cross Sectional view
- Photo of the Wet Land
- Septage unloved at Treatment plant

**Part 4 : Registering Statistical Details**
The worker or the Health supervisor should share the details of the records to be maintained about septage management
• The date and details of the toilet from where sludge was removed.
• Number of tanks of sludge removed.
• Number of tanks of sludge emptied in the onsite tanks.
The records to be maintained by the Septage Treatment Plant:
• The registration number of the septic tanker vehicle, Driver's name and the telephone number and the name of the company.
• The number of tanks received and their capacity.
• The time of arrival of the vehicle to the plant.
• The name and details of the place of septage removal
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**Cross Sectional view**

**Photo of the Wet Land**

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- The number of tanks received and their capacity.
- The time of arrival of the vehicle to the plant.
- The name and details of the place of septage removal
RECOMMENDATIONS:

- The Kerala government have to build septage treatment plants in all the districts.
- When there is no septage treatment plant nearby to dispose the septage from the septic tank a constructed wet land can be built in every panchayat.
- The untreated fecal sludge extracted from the septic tanks have to be drained in the designated treatment plants.
- The septic tanks or the leach pits are to be placed at a safe distance of 15 meters from the dug wells to avoid filtration of black water causing contamination.
- Disposal of untreated fecal sludge into the water bodies should not be allowed.
- Thorough hygiene education has to be given to all those involved in this work.
- Knowledge about Sewerage Treatment Plant and Fecal Sewage Treatment Plant has to reach all walks of people.
- Onsite toilet technology training to be provided to the masons to ensure the right construction method.
- Networking of sludge tank operators with GPS installations to be installed for ensuring the movement of the effluent to the designated sites.
- Fecal Sludge Management campaign should be imparted at State level to reach every household.
- All the existing septic tanks have to be fitted with a soak pit for the discharge of surplus water.
- Training on FSM and FSTPs have to be imparted to all the LSG and District level officials.

References:

Acknowledgements:
1. Dr.V.Kurian Baby, IAS (Retd.), Served in Government of Kerala as Secretary for LSGD gave his valuable input on SOPs.
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3. Mrs.V.Vijaya, Bangalore
4. Shri.Anand Ganeshlyer, Ernakulam, Kerala
Do's and Don'ts:

Gramalaya’s SMART Toilet

NATIONAL POLICY ON FAECAL SLUDGE AND SEPTAGE MANAGEMENT (FSSM)

Clean India

A Step Towards Cleanliness

Haritha Keralam

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