

LIQUID WASTE MANAGEMENT IN RURAL AREA

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Abstract: Disposal of waste water is a major public health problem in rural areas. Stagnant waste water smells bad and also acts as breeding place for mosquitoes resulting in spread of diseases like dengue, malaria, etc. Proper disposal and also reuse of waste water wherever possible will help in combating diseases as well as meeting water scarcity. In India generating liquid waste (greywater) of the order of 15,000 to 18,000 million liters. As a result, in the absence of proper disposal of solid and liquid waste (greywater and waste water from the hand pump), they are leading to vector born diseases such as diarrhoea, Malaria, Polio, Dengue, Cholera, Typhoid, and other water borne infections such as schistosomiasis.

Keyword: Liquid waste management, Grey water, Black water, Soakage pit, Leach pit.

I. SOURCES OF WASTE WATER

From domestic use e.g from toilet, bathroom, washing of clothes and from kitchen. Community e.g from industry, commercial and business activities, institutions, healthcare establishments, market places, farming activities etc.

Type of Waste Water

1. Grey water is waste water from bathroom, washing of clothes and kitchen. Depending on its use, water can require less treatment than black water and generally contains fewer pathogens. Treated water can be reused for garden watering, fodder raising and kitchen gardening.

2. Black water is water that has been mixed with waste from the toilet. Black water requires biological or chemical treatment and disinfection before re-use.

II. WASTE WATER QUANTIFICATION AND CHARACTERIZATION

No	Source of waste water	Type of Waste water	Quantity/day /person
1	Toilets	Blackwater	3 liters
2	Bathing	Greywater	20-30 liters
3	Kitchen	Greywater	5-10 liters
4	Washing cloth	Greywater	15-20liters

III. WATER MANAGEMENT FOR RURAL AREAS

From the analysis of the sources of waste water and its types, it is revealed that more than 90 percent of waste water generated is greywater. Therefore, greywater management is a major challenge in rural areas in the country. Water management may involve reuse/recycling of water after appropriate treatment for a variety of purposes including irrigation, domestic purposes and toilet flushing.

For effective management of water in rural areas, focus should be on management at household level. In case it cannot be managed at household level, management at the community level should be done. As far as possible, water generated at household level should be managed such that zero or minimum community waste is generated.

IV. TECHNOLOGICAL OPTIONS FOR WASTE WATER MANAGEMENT

- The village level water management system should be as simple as possible for a village level person to understand and implement.
- It should be decentralized.
- Technological options are based on:
 - Domestic (Household) level management.
 - Community level management.

V. TECHNOLOGICAL OPTIONS AT HOUSEHOLD LEVEL MANAGEMENT

It will always be better to manage and treat domestic greywater generated in the house in the area/courtyard/land surrounding the house. The following technological options will be suitable for this purpose:

1. Soakage pit
2. Leach pit
3. Kitchen Garden with piped root zone system
4. Kitchen Garden without piped root zone system

SOAKAGE PIT

Soak pit is a dug out pit filled with stones or preferably over burnt bricks. The large numbers of stones or bricks increase the surface area over which biological and chemical action takes place. The water seeps into the ground and reduces danger of polluting the ground water sources.



Fig. 1 [Soakage pit]

Advantages -

- This is the cheapest technology for management of water at household level.
- Prevents greywater stagnation.
- Prevents vector breeding.

LEACH PIT

Leach Pit is a brick lined pit constructed in honeycomb masonry having a volume of about 0.75 cubic meters.



Fig.2 [Leach pit]

Advantages

- It can handle large volume of water during peak period of water generation and is better suited than soak pits.
- Prevents stagnation of greywater.
- Prevents vector breeding.

VI. TECHNOLOGICAL OPTIONS FOR COMMUNITY LEVEL MANAGEMENT AT PUBLIC PLACES-ON SITE

Community level greywater can be divided in two types:

- Greywater in rural areas in public places like public stand posts for water supply, wells, hand pumps, schools etc.
- Greywater from houses which can not be managed at domestic level.

The greywater from public places would have minimum quantity of pollutants. While domestic greywater which becomes community greywater in due course, will have grease, kitchen waste water, food particles, bathing and clothes washing water, silt etc.

On site management of community greywater

The greywater generated at public places is usually a cleaner water. This greywater can be preferably managed on site by adopting the following technological options. These options can also be adopted for managing institutional greywater which is from bathing, clothes washing etc.

- Plantation with intercepting chamber
- Community leach pit
- Soakaway channel
- Simple process of reuse of greywater
- System of waste water treatment such as root zone system

VII. REUSE OF STABILIZED WATER

Greywater stabilized and cleaned by the use of any of the above mentioned systems can be reused in many ways.

IRRIGATION FOR AGRICULTURAL USE

The treated greywater has large quantity of dissolved plant nutrients. As a result, its use in agriculture is beneficial. Once farmers realize it, its sale can be financially advantageous for Gram Panchayat.

IRRIGATION OF HORTICULTURE

The water can be used beneficially for fruit gardens, horticulture etc. Thus it can become a source of income for GP. The water can be used also for public gardens and parks in the village.

FISH FARMING

Fish farming can be undertaken with the use of such treated water. This can become a source of income for GP.

CONCLUSIONS

- There are the in study area good and better infrastructure provided for the liquid waste management.
- The waste disposal needs immediate attention and strict monitoring.
- The number of treatment process plants has to be increased to manage total quantity of waste generated.
- Proper training and education needs to be provided to the workers and public awareness programs should be conducted regularly.

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