

## Need of Solid and Liquid Waste Management in Rural India

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**ABSTRACT:** In many parts of rural India, solid waste management is practically not practiced. As a result, solid wastes are found littered on the street and dumped near water bodies, low lying areas and on areas on the periphery of villages. Gram Panchayats are not involved in solid waste management and no resource of gram panchayat is engaged in solid waste management. As a result, environmental condition in villages is deteriorating. Therefore, Gram Panchayats need to consider solid waste management as an important activity. Necessary resource allocation in terms of fund, equipment and manpower needs to be made. Similar to solid waste management, liquid waste management is also neglected in rural areas and Gram Panchayats need to take responsibility for liquid waste management.

**KEYWORDS** - Solid waste, liquid waste, gram panchayat, waste recovery center, SLRM, IEC

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### I. INTRODUCTION AND CONTEXT

In addition to sanitation, solid and liquid waste management are major environmental concerns in rural areas of India. The issue of poor solid waste and liquid waste management is severe in rural areas with high population density. In rural areas with low population density, the problem of solid and liquid waste management is yet to become a serious issue. In India, Gram Panchayats are not involved in solid and liquid waste management. No resources of Gram Panchayat are allocated for solid and liquid waste management. Recently, Govt. of India has recognised this problem and solid and liquid waste management have been made a part of Swachh Bharat Mission.

### II. THE CASE STUDY

The case study is a project for solid and liquid resource management (SLRM) in some gram panchayats in rural areas of the state of Assam. Similar projects are being implemented in other states of India. The SLRM project in Assam is proposed to provide solid and liquid resources management facilities within the Gram Panchayat areas. Detailed project reports are prepared to identify the solid and liquid resource management works in the Gram Panchayats. For preparation of the detailed project reports, the following activities were carried out:

- i) Site visit and reconnaissance survey along with gram panchayat officials and villagers.
- ii) Assessment of existing situation in gram panchayat jurisdiction areas.
- iii) Collection data on solid & liquid waste generation with the help of structured questionnaire.
- iv) Identification of SLRM works to be taken up.
- v) Selection of sites for proposed solid waste recovery centers.
- vi) Preparation of details of proposed works including detailed cost estimates.
- vii) Study of present institutional arrangement for O & M.
- viii) Preparation of details for capacity building for stakeholders and IEC activities.

Status of Solid Waste Management:

Density of population in many villages in Assam is low. Also, plot size of each household is big. This is in contrast to villages in north India, where population density is high with relatively smaller plot sizes of households. During visits to the gram panchayats, it was observed that segregation of solid waste is not practiced at generator or at disposal level. At present, there is no collection and disposal mechanism. The Gram Panchayats do not have any infrastructure to collect and transport the waste and there is no specified location for waste disposal. Majority of the households utilize biodegradable waste at source itself by feeding cattle with vegetable waste and cow dung is either used within the household premises or transported to agricultural fields. For non-biodegradable wastes, plastic and polythene wastes are burnt by households or thrown in open fields and drains. As per survey details, about 90% of the households dispose or throw solid waste on the street or backyard and 10% of the household claim to dispose solid waste by burning it. A few households were managing biodegradable waste by composting. There is no separate collection system of biomedical waste in the villages. At present, there is no scientific system of collection, transportation or processing of bio degradable

and non-biodegradable wastes in the villages. There is no system of collection solid wastes from market areas and institutions.

**Status of Liquid Waste Management:**

Grey water management is found to be inadequate due to lack of proper drainage system in the villages. There are no road side drains. It was observed that the grey water is usually disposed near source of water such as hand pumps and in to the low-lying areas. Stagnated pockets of grey water were observed near the location of bathrooms, kitchens and cloth washing platforms. Majority of households are found to have toilets with septic tanks or leach pits in their premises. Outlets of the septic tanks are linked to soak pits or open drains on the backyard. There are few community toilets in public places. As a whole, no major black water management issue was observed in the villages as most of households have toilets with septic tanks or leach pits.

**Strategy for Solid and Liquid Resources Management:**

The proposed strategy for solid and liquid resources management within the gram panchayat areas consists of the following:

- i) Household level composting will be suitable for management of biodegradable wastes due to its acceptance and availability of space on backyards of households. For the management of non-bio degradable wastes, Waste Recovery Centre (WRC) is proposed to be constructed in each gram panchayat.
- ii) It has been proposed that solid wastes generated will be stored by the households in two separate bins. Out of them, one will be for bio-degradable waste and the other one for non-biodegradable waste. Two containers of 10 litre capacity each for a family of 5-6 members would ordinarily be adequate. For household level composting, Ring Compost bins are found to be suitable and proposed for use. The non-biodegradable waste will be collected to a waste recovery center for secondary segregation. Such waste mostly contains polythene bags, plastics and bottles in rural areas. Overall, the focus is to treat organic waste at the household level itself and only the dry waste will be collected for secondary segregation. The door-to-door collection of dry wastes will be done at an interval of once in a week. It is proposed that non biodegradable waste from the households will be collected by tricycle with containers of 200 liter capacity with ringing bell.
- iii) In Commercial and vegetable market areas of villages, the shops should have their own dustbins for separation of dry and wet waste. The waste collector will collect segregated dry and wet waste through tricycles in scheduled time frame. The shop owner may have to pay a minimal collection levy to the authority. The major roads of villages will be swept by waste collector in schedule time frame. The waste will be collected and transported to Waste Recovery Centre.
- iv) From Institutions, only dry waste will be collected by the waste collector within a scheduled time frame and will be transported to Waste Recovery Centre. The institutions will be responsible for managing their biodegradable wastes within their campus itself by using suitable composting technology.
- v) The segregated waste collected from households, institutions, commercial establishments etc. through door to door collection will be transported to waste recovery centre for further processing and recycling. The waste recovery center will receive biodegradable wastes from market areas and non biodegradable wastes from households, institutions and market areas. For processing of biodegradable wastes, Aero Bins are proposed to be installed in the waste recovery center. Non biodegradable waste will be segregated and recycled. A pit with impervious lining will be constructed within the premises of waste recovery center for disposal of non recyclable and inert wastes.
- vi) Grey water management is inadequate in all villages, as water stagnation is observed near bathrooms, kitchens and utensil and cloth washing platforms. Household level soak pit is found to be suitable for liquid waste management in villages except in villages within tea gardens and in peri urban villages. In most of villages within tea gardens and in peri urban areas, there is no space for construction of soak pits. In these villages, road side drainage improvement will be necessary. Thus, road side drainage improvement is proposed in villages located inside Tea Gardens and in peri urban areas.

### **III. MAJOR FINDINGS AND CONCLUSIONS**

The major findings and conclusions from the project are:

- i) The strategy and technologies to be adopted for solid and liquid waste management will be different in different states and regions of the country. This is due to different population density and different prevailing practices of solid and liquid waste management in rural areas in different states and regions.
- ii) The most appropriate strategy for solid waste management is household and community level composting for biodegradable wastes and community level processing and recycling of non biodegradable wastes in waste recovery centers.
- iii) Liquid waste management strategy will vary in different regions. In villages with high and medium population density, proper road side drainage network and community soak pits will be useful for grey water management. In such locations, the road side drains also convey partially treated waste water from septic tanks of households. In villages with low population density, household level soak pits may be appropriate for grey water management.
- iv) Management of septage by collection and treatment of sludge from septic tanks of households is an issue in many villages. This can be addressed by the setting up of community septage management centre for a cluster of several villages.
- v) In India, Gram Panchayats will have to take responsibility for solid and liquid waste management in their jurisdiction areas. To achieve this, existing legislations will have to be amended to include solid and liquid waste management as activities to be performed by Gram Panchayats. Appropriate strategy for solid and liquid waste management for each Gram Panchayat jurisdiction area will have to be formulated. Each Gram Panchayat will have to implement its own strategy.

Disclaimer: The findings and conclusions presented in the paper are personal opinion of the author.

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