

Solid Waste Management in Rural Areas of District Bijnore

When economies go after indiscriminate market-based growth and the people go after a consumerist culture, the apparent side-effect is 'unmanageable waste generation'. There was a time that this was considered as a phenomenon of the West; and later of the cities of the fast emerging economies; and currently it is everywhere including the villages in India. The villages in general and those on the periphery of cities and towns in particular are at the frontline as far as indiscriminate and unmanageable waste generation is concerned. The concern is that at the end of the day, all the garbage falls on the lap of the Gram Panchayat (GP) to clean it up.

'Sanitation and street cleaning' is one of the basic functions of a Gram Panchayat, and they should make arrangements for attending to it. Solid waste management has become a practical necessity in rural areas too. Next to becoming Open Defecation Free (ODF) villages, the Swachh Bharat commitment demands rural households to dispose of garbage in a scientifically sensible manner. Domestic refuse from individual households should not become a cause for unsightly streets and unhealthy rural environment. An essential requisite for a healthy rural environment and quality living is the Gram Panchayats (GPs) should put in place an arrangement for garbage collection and disposal in a manner that is socially acceptable and technically sound. In the absence of an effective system in place, it is unjust to blame the households of irresponsibility.

The domestic waste generated in rural households of India is increasingly becoming an issue of serious concern. Though, solid waste generated in rural areas is predominantly organic and biodegradable, it is becoming a major problem as the waste generated is not segregated at house hold level and is of the order of 0.3 to 0.4 million metric tons per day. Inconsiderate littering causes poor environmental sanitation resulting in unhealthy quality of living. Therefore, domestic-refuse should be handled responsibly. In order to manage waste in a desirable way, there should be a functional waste management system in place.

Panchayat functionaries meeting: The Panchayat President, Vice-president, secretary, and other ward members should express their willingness and support, and resolve to take up the cause of clean GP within certain time period (one year).

Gram Sabha Meeting: Gram Sabha should discuss about (and pass a resolution) what it means to be a clean village; in what way each household may have to cooperate etc. This can include resolutions such as:

- (i) Cloth bags to be used, and avoid use of polithin carry bags;
- (ii) Tea stalls to use only stainless steel glasses and no usedisposable plastic and thermocol and-throw cups;
- (iii) A by-law in this regard can be prepared and passed.

Community Education: Various segments of the community need to be educated. It must include the households, SHGs, shopkeepers, tea stalls, local restaurants, school children, marriage and community halls etc. It is good to meet each group separately. Community education must essentially include: what are bio-degradable wastes; and what are non bio-degradable wastes? Which ones are recyclables; what hazardous wastes are; what is meant by primary segregation that the households are supposed to do?

Identify infamous spots: Generally street corners and empty land in between houses are vulnerable spots to become 'undeclared dump yards'. Every household silently assume that spot for dumping household wastes. There are three things that need to be done about such places.

- (a) First of all, identify such infamous places / spots;
- (b) the garbage heap in such places must be moved to some existing landfills; and
- (c) fencing can be done to prevent future misuse, or if it is a common land, put some plants or tree saplings to grow.

Community Preparation: Each household must be provided with three buckets – Green, Blue and a Red one.

- (a) The Green bucket is for disposing of kitchen refuse, leftover food and other wet waste;
- (b) The Blue bucket is meant for keeping dry wastes; and
- (c) the Red bucket is for keeping hazardous wastes like batteries; fused bulbs etc. For an illustrative list of wet waste / dry waste / hazardous waste see Box (Waste Category). The wet waste in the Green buckets shall be collected daily morning (or morning and evening) as decided by the Gram Panchayat. Collecting two times a day (morning and evening) renders handling easy. That is when the waste is still fresh and has not started emitting smell, effective segregation becomes easier, than handling wastes that are stale and decayed. The dry waste shall be collected separately, and the hazardous waste shall be collected from households once a month, for instance, on the 5th day of every month. If found more, it can be made once a fortnight. The chance of hazardous waste being more is very remote.

Waste Category Wet Waste (Green)	Dry Waste (Blue)	Hazardous Waste (Red)
Vegetable peels	Soap covers / pockets / sachets	Mosquito repellent refill bottles/ Mosquito repellent mats
Fruit peels	Empty shampoo bottles	Expired medicines
Rotten fruits and vegetables	Empty perfume bottles/ containers of deodorants/ shaving creams	Tablet covers / Syrups bottles
Leftover food	Milk covers	Any medical discard
Used tea / tea bags	Used door mats	Sanitary napkins
Used coffee ground	Used tooth brush	Children's diapers
Egg shells	Chocolate wrappers	Used condoms
Coconut shells (including tender coconut shell)	Butter wrappers	Used razor / razor blades
Mango kernel & any seed	Used mop cloth	Old batteries
Coconut fibre	Ghee / oil pockets / cans	Fused bulbs / tubes / electrical items
Used flowers / dry flowers	Package / polythene covers / Plastic covers	Broken glasses / ceramics
Spoiled spices	Newspapers / card boards	Empty cans of toilet cleaners
Floor sweeping dust	cosmetics containers	Expired cosmetics
Meat & non-veg remains	Styrofoam	Cockroach killers / spray cans
Expired bread, biscuits and other food items	Broken stationery like used pens, pencil sharpener	Old printer cartridge / CDs
Hair	Empty cans of floor cleaners	Rusted iron pieces

Garden shrubs	Kurkure / Lays packets	Used odonil bottles
Floor sweeps	Unusable shoes /	Old Electronic items / parts
Road sweeps	Sachets (of shampoo, creams etc.)	Pieces of wires, old chargers, old pen drives
Bisleri kind of water bottles	Old paints / old household chemicals / cleaners	
Used tooth paste tubes etc.	Insecticide sprays / leftovers	
Broken household plastic items / and toys	Toxic rejects	
Metal tins, and cans (e.g Pepsi Coke cans) – Aerosol cans	Cotton/ tissue papers used for medical purpose	
Small tubs like the ones used for yogurt, cheese, jam	Empty cans of lubricants used for car / bike.	
Pieces of aluminum foils		
Old brooms		
Paper napkins, Tetra pockets		
Destroyed old cushions		
Leather, rexene, rubber		
Iron pieces		

Community Preparation through IEC: The GP residents hold the key for success in solid waste management. Human propensity to respond to a call for any change generally does not receive the same level of cooperation and support from all corners. First of all, it requires inscribing in the minds of the community that the GP is serious about it; secondly, it should be personally convincing for them to play their part and cooperate; and thirdly what they witness as manifested behaviour of GP functionaries should gradually strengthen their trust in our efforts. All these require a series of IEC campaign.

SBM facilitators, in association with GP functionaries, need to plan for a series of IEC campaigns to educate the residents on: why scientifically manage solid waste; and how segregation at the household level eases the entire process of managing waste at subsequent stages. The community members / households should be clear about it at the outset. The suggestions that follow will help to conduct IEC campaigns for this purpose.

Task Description for SWM Workers

1. The sanitation workers shall collect waste primarily segregated at the household level.
2. After reaching the **Segregation Shed**, the sanitation workers feed into the **incinerator** (combustion chamber) all the diapers, sanitary napkins and such items handed by households wrapped in old newspapers. This is about the RED bin.
3. Then they turn to handle wet waste: They shall do secondary segregation of the wet waste. During secondary segregation, their main job is ensuring that wet waste do not have any mix up of other types of wastes.

4. Before the wet waste goes into composting or into a gasification plant, the workers shall do the necessary chopping, crushing (using the crushing / chopping tool installed at the segregation shed) so as to make it fit for faster composting / easy gasification. This is the technical arrangement for treating wet waste. This is about the GREEN bin.
5. The workers then do segregation (tertiary segregation) of dry wastes. The main task here is sorting various materials like plastics, bottles, papers, card boards, cosmetic containers, tins separately. This classification results in grouping items that can be sold for scrap dealers (that means what goes for recycling to recyclers), and those items that must be sent to designated landfill area. This will include other hazardous wastes, if any.
6. The items picked from the dry waste for sale to recyclers shall be kept in a store. This will be part of Segregation Shed. Incinerator will also be part of the Segregation Shed.
7. Periodically, it will also be a responsibility of the sanitation workers to take out the manure from compost yard / gas plant, and keep them in sacks.

Task Description for SWM Supervisor / Inspector

1. Educate and train the workers on collection, and segregation.
2. Supply uniform, green caps, and other protective gearings to the workers
3. Introduce to the sanitation workers how to use the incinerator; how to use the segregation shed; how to use the chopper / crusher tools; how to use the gasification plant, if available.
4. Make periodical plans assigning workers for various tasks in waste management.
5. Make sure that the waste transported by trucks / trailers from one place to another is 'covered properly and transported'.
6. Oversee and educate workers on waste segregation until they become familiar with segregation methods. Arrange for exposure, if required.
7. Arrange segregation and sale of recyclable wastes.
8. Identify a suitable place to be used as landfill, and prepare – beware of dumping being called as landfill.
9. Oversee the type and form of waste fed into the composting / gasification plant, that the garbage are of acceptable type and in acceptable form.
10. Oversee the waste that come from markets and restaurants are in acceptable form before they are fed into the composting / gasification plant / incinerator.
11. Oversee the use of incinerator – how it is used, and what goes in there?
12. Make sure that no dumping takes place anywhere in the GP by any sanitation worker or by residents. Nub such practices in bud, while the SWM project is on the runway.
13. Attend to the complaints brought about by the Sanitation Workers promptly.
14. Ensure the workers get their wages on time, and recommend for incentives from the sale of recyclable items.
15. Ensure the health of the workers through periodical health check-up, and if they use their protective gearings while at work.
16. The sanitation workers should not work overtime, nor should they be allowed to laze around. Calculate and deploy the right number of workers, and they should get one-day weekly off on rotation basis. Along with their monthly wages, they should be supplied toilette - two detergent soaps, and two bath soaps.

17. They should associate their work with cleanliness and as part of preventive health. Their perception of their work should be that they are managing waste scientifically, which is an extremely serious problem world over; and that in the process, they are converting waste into recyclable products, energy, and usable manure, which is a wonderful thing. They should not feel small about what they are doing; and no one should be allowed to look down upon them

Technology for Management of Solid Waste

The following technologies have been proposed to manage the solid waste:

- **Biodegradable waste** (household with cattle) will have a common solution for management of household biodegradable waste and cattle waste (dung, urine etc.)
 - a. Home Composting Unit (recommended for households without cattle)
 - b. Vermi Composting Unit (recommended for households without cattle)
 - c. Biogas Plant (recommended for households with cattle and animal waste of 30-40 Kg every day)
 - d. NADEP Composting Tank (recommended for household with cattle but not interested in biogas plant)
 - e. Foldable composter (recommended for households who do not want to use any fixed place for composting and may require to use the space for other purposes occasionally)
 - f. Earthen or pot composter (recommended for household who generate very less quantity of waste and do not have space or not willing to have relatively expensive composting option)
- **Recyclable Waste**
 - a. Households store and sell to local scrap dealers or kabadiwalas.
 - b. GP collects the recyclable wastes from households, stores and sells to kabadiwalas.
- **Non-recyclable Waste**
 - a. Periodical collection from households by the GP.
 - b. Storage by GP in a centralized shed for safe confinement.
- **Payment for Services**
- The tariffs set for the SWM services with respect to different users are suggested below. However, the best way to do this is each GP can work out a budget (of likely expenditure to be incurred on SWM, and accordingly work out the service charges [rates] for each category of service users, which should serve as income to be able to meet the expenditures). The following is a suggestive tariffs for different user categories.
 - 1. The service charges for SWM shall be payable to the sanitation worker (or sanitation supervisor) at the door steps of service users before the 5th day of every month, unless otherwise specified. This is easier to collect and easier to pay. A receipt for the amount paid shall be insisted on by the residents who pay.
 - 2. Alternatively, the services charges may be paid at GP Office before the 5th of every month in advance.
 - 3. Payment for SWM service under the terms and conditions laid down in the bylaw if not paid by the party concerned within the time stipulated shall be recoverable in the same manner as house tax.
 - 4. Waste baskets given for SWM purpose shall not be put to any other use, causing SWM to suffer. In such an occurrence the amount spent on the baskets shall be recovered at double the price.

- 5. Household not wanting to involve themselves in primary segregation can do so, provided they are prepared to pay Rs.80 every month, instead of the regular Rs.30.

Sl.	User Category	Service Charge (monthly)	Remarks
1	Households	Rs.30 /Rs.80	Payable monthly (Type – A) (If a household does not want to spend time on primary segregation, they can opt to do so on additional payment of Rs.50 every month. They shall be known as Type –B.
2	Tea stalls	Rs.40	Payable monthly
3	Village restaurants and eateries	Rs.60	Payable monthly
4	Marriage halls	Rs.500	Payable after every marriage
5	Vegetable markets	Rs.30	Payable monthly
6	Mutton & chicken stalls / Fish markets	Rs.60	Payable weekly
7	Grocery shops	Rs.40	Payable monthly
8	Schools and offices, if any		Payable monthly
9	Temples, churches, mosques etc. (unless they have their own waste disposal arrangement)		Collected from the community along with the collection made for temple festivals / local festivals.
10	Others (such as dispensaries)		

The long- term outcomes of this project:

- ✓ This will comprise of systematic waste collection system in residential area, shops, composting of organic waste, recycling of inorganic waste and scientific disposal of non- recyclable waste.
- ✓ Establishing the principal of cost recovery from waste.
- ✓ Spreading the concept and practices of converting waste to wealth.
- ✓ Informed and sensitized civil society who can be motivated and involved in their similar projects and initiative.
- ✓ Creating employment and enterprise opportunities in Green industry especially among Women/ Men Self Help Groups.
- ✓ Education and involvement of youth in general and students in particular in environmental governance.
- ✓ A well designed information system, info-bank and access through internet.
- ✓ Documentation of the activities processes & best practices for future guidance and replication to Gram Panchayat.