

# A Review on solid waste management

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**Abstract-** Solid waste management is one of the basic services provided by local government units (LGUs) to the public, and disposal is one of the more critical aspects since it has a great potential to impact the public health and the environment. Thus, there is an urgent need to build the institutional and technical capabilities of local governments to address this need.

Solid waste management should be financially, environmentally, technically, socially and often, politically acceptable to the LGUs.

**Index Terms-** Solid waste management, waste site, dump site, by-products, generated waste, Decomposition procedure.

## INTRODUCTION

*Planning for Closure.* As in any successful endeavor, planning is essential to closing open dumpsites. The roles and responsibilities of those to be affected by the closure, such as the LGU, the dumpsite operator (if not the LGU), the community and others, should be defined. Prior to actual closure of the dumpsite, an investigation of the existing conditions of the site is conducted. The findings and assessment will enable planners to draw up the practical options or alternatives to meet the objectives, and will be used in the development of a closure plan.

*Elements of a Closure Plan.* A closure plan details the various activities that will be implemented during the actual closure of the site. Elements of the plan include the stabilization of steep slopes to prevent erosion hazards, the implementation of leachate and gas management systems, and the design of the final cover. Other activities in a plan should consider the measures to be adopted to prevent future illegal dumping at the site, plan for informal settlers (if any), installation of monitoring wells, and the security measures to be implemented to prevent unauthorized access to the closed site.

*Post Closure Management Programme.* The decomposition of biodegradable wastes in open dumpsites will result in the production of leachate and gas long after the site has stopped receiving wastes. Thus, a post closure plan is developed to allow for continued maintenance and monitoring of the site for a period of at least ten years.

*Attendant Costs of Closing a Disposal Site.* Closing a disposal site entails costs. Expenditures for closure cover capital and operational expenses. Capital expenses include those for final cover materials, drainage, leachate and gas management systems, and relocation of informal settlers, among others. Operational expenses generally include rental of equipment and manpower requirements. Expenditures for post closure management are also considered in this section.

*Afteruses of a Closed Dumpsite.* A closed dumpsite may later be used as a green area, recreation area, or for construction purposes. However, its planned after use will need to consider such factors as differential settlement, bearing capacity, gaseous emissions, and corrosion of metals. These factors often dictate the potential uses of the site, such as the kind of structures that can be erected over it, the kind of vegetation, and the types of materials that may be buried underneath it. Because open dumpsites are unplanned and haphazardly operated, the practical beneficial afteruse are often limited.

*Remediation/Cleanup Options.* These are required when problems develop at a closed dumpsite. Problems such as severe leachate leakage, waste slippage and exposure, or fires and explosions often result from improper and/or inadequate closure and post closure procedures. Solutions may vary from simple excavation to more aggressive and costly remediation or cleanup technologies like groundwater

isolation, soil washing, and the use of microorganisms.

*Upgrading of an Open Dump into a Controlled Disposal Facility.* As with the closure of open dumpsites, upgrading into controlled disposal will require planning. A site assessment has to be conducted first in order to determine if the open dumpsite is convertible to a controlled dump. If conversion is not practical based on several criteria/considerations, a new site will have to be developed.

Development of a controlled dump on a new site has to comply with several criteria such as siting and design requirements. Because of the minimal infrastructure requirements for controlled dumps (e.g. no liner with required permeability), finding a site with suitable hydrogeologic conditions is essential. Preparation of the disposal area mainly involves the provision of adequate gradient, minimal compaction of the soil, and the construction of drainage management systems.

Conversion of an open dump into a controlled dump means that disposal will be on a site previously used for open dumping. Thus, preparation of the area will consist of leveling and compacting existing garbage heaps and construction of drainage canals/ ditches, among others. Prescribed operational procedures include limiting the working face area, application of daily cover and miscellaneous provisions such as installation of litter barrier and others. The facility is also monitored for incoming waste volumes, water quality, condition of drainage systems, and others.

*Shifting from Controlled Dumping to Sanitary Landfilling.* This stage is the most demanding for LGUs in terms of financial resources, technology, and expertise. The development of these disposal facilities requires thorough planning and design, from its inception to its planned afteruse. Siting, design, construction and operation requirements are much more broad and stringent than other modes of land disposal. Sanitary landfills have the least impact to public health and the environment as compared to open dumpsites or controlled disposal facilities.

*The Cost of Waste Disposal.* Waste disposal cost can be categorized into capital and operating costs. The former includes costs for land acquisition, machinery

and equipment, designers/consultants fees, site preparation and construction, and closure and post closure requirements. Operational costs are associated with the daily operational requirements of the facility, including salaries, maintenance costs, and others. These are generally recovered through tipping fees.

*Public Participation.* The involvement of communities impacted by a proposed project is essential to the project's realization and success. The decision to develop waste disposal facilities is not only for a few to make but for all who will be affected by it. Thus, decision-makers and planners should involve all stakeholders right from the siting process up to the facility's post closure phase. Otherwise, there may be problems during the facility's construction and operation, or the project may not materialize due to public opposition.

The basic requirements for closing an open dumpsite include providing final soil cover, vegetation layer, drainage control system, leachate and gas management systems, monitoring systems and site security. Post-closure management on the other hand, requires a maintenance programme to ensure the proper functioning of the facilities/infrastructure (such as final cover, surface drainage facilities, monitoring and leachate and gas management systems) for a period of at least ten (10) years.

The basic requirements listed above are minimum requirements. There may be additional activities for implementation during closure and post-closure management of an open dumpsite, not necessarily required by local regulations. Actual field application should be adjusted or modified to suit the particular case.

It should also be noted that unlike sanitary landfills, open dumpsites are generally unplanned, haphazardly operated and do not have environmental controls. Therefore, the standards to be adapted or applied for their closure and post-closure care should be similar, if not more stringent, than for sanitary landfills because the contaminants that emanate from them are greater.

- Become aware of the options, strategies and alternatives available to them to solve the problem.

## CONCLUSION

Improper solid waste stored in the house and its disposal is found in most of the wards of the city. They used to keep the solid waste inside the house in open space and in open container attract flies, vectors pathogens, rats, mice and cockroaches. Disposal practices also improper, they thrown the solid waste in vacant field near to the home, in absence of R.C. container, pucca or kuccha parao ghar. Nagar Nigam is unable to collect all the solid waste of entire of the city due to lack of infi-astucture. Most part of the city can be seen with uncollected solid waste. For this worsening condition not only the responsibility lies on Nagar Nigam but also residents of the city are also responsible. Lastly but not the least the city environment is degrading day by day due to cumulative effect of population explosion, air, noise pollution, social pollution, increment of solid waste generation, broken roads, concrete jungle, mushrooming temple and statues of known or unknown personalities on every conceivable piece of government land and road, unmanageable traffic, sky rocketing, crime graph, selfishness, indecent and vulgar language, communally surcharged atmosphere is turning the city of Nazakat, Nafasat, sharafat famous for its Ganga Yamuna tahzeeb, the capital of Uttar Pradesh in to hell.

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