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CASE STUDY OF SOLID WASTE MANAGEMENT IN GORAKHPUR CITY

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ABSTRACT

This project is a presentation of the problems of solid waste management in Gorakhpur and certain important issues that must be addressed in order to achieve success. At the core of the problems of solid waste management are the absence of adequate policies, enabling legislation, and an environmentally stimulated and enlightened public. Government policies on the environment are piecemeal where they exist and are poorly implemented. Public enlightenment programs lacked the needed coverage, intensity, and continuity to correct the apathetic public attitude towards the environment. Up to now the activities of the state environmental agencies have been hampered by poor funding, inadequate facilities and human resources, inappropriate technology, and an inequitable taxation system. Successful solid waste management in Gorakhpur will require a holistic program that will integrate all the technical, economic, social, cultural, and psychological factors that are often ignored in solid waste programs.

1. INTRODUCTION

There is great demand of converting thedifferent types of waste into some useful forms suchas fuels and chemicals. However, the waste materialsupon which the present paper is going to focus isbased on Gorakhpur city of Uttar Pradesh state of India. Gorakhpur is the prime whole sale and retailcommercial centre for the surrounding rural areas it isalso the middle income group dominant city (50%habitat belong to MIG). In residential solid wastegeneration, the middle income group is at the top.In Gorakhpur city the waste generation amounts to be350 tons per day and will increase as the populationgrows and access to consumer good increases. Thereare 230 hospitals and nursing homes in the city.Many of these considered as waste generated as solidwaste and not biodegradable waste. However,modern situation of the worlds have enoughtechniques to convert these non-biodegradable wasteinto energy. There are different waste managementtechniques are existing such as landfilling, mechanical recycling, chemical(feedstock) recyclingand incineration. It should be noted that landfilling iseasiest one for handling waste but space scarcity fordisposal of waste are limited now a days. On theother hand landfilling produces leachets and reducethe quality of underground water. Incineration which is nothing butworst option from global warming point of view. Mechanical recycling which is a process of

converting the waste (such as plastics, e-waste etc.)into virgin one. There is only chemical recycling orfeedstock recycling which is the process ofconverting the waste material into some useful formof energy in eco-friendly manner. The present paperpresent a grasp on the main techniques such aspyrolysis (catalytic, plasma, microwave) andgasification. These techniques have been describedin detail in the below hidings. As far as wastematerial is concerned it include e-waste, plastics,biomedical waste, industrial waste, MSW hazardous waste etc.

2. WASTE GENERATION IN GORAKHPUR CITY

Gorakhpur, a low lying and bowl **shaped**city of Eastern Uttar Pradesh, is rich in the culturalheritage and historical importance. At present the municipal corporation Gorakhpur (MCG) has no solid waste management system in place. The whole solidwaste generated is being disposed either along theroads or are being used as landfilling material. During the survey it was found that daily on anaverage per capita solid waste generation from theresidential area of the city is about 0.270 kg. Thoughthe municipalstandard (0.375 grams) is quite higher.

Table. 1 Estimated solid waste generation per day in city

Category	Generation amount (in tons)	Percentage
Residential	168.13	57.86
Constructionand other	41.4	14.24
Commercial	40.0	13.76
Industrial	40.0	13.76
Industrial	0.53	0.18
ClinicalWaste	0.50	0.17
Total	290.56	100

3. HANDLING RULES OF SOLID WASTE MANAGEMENT

The jurisdiction of the rules have been extended beyond Municipal area to cover, outgrowths in urban agglomerations, census towns, notified industrial townships, areas under the control of Indian Railways, airports , airbase, Port and harbour, defense establishments, special economic zones, State and Central government organizations, places of pilgrims, religious & historical importance.The issue of collection and disposal of sanitary waste like diapers, sanitary,padsand other disposal items have been addressed. Manufacturers or Brand Owners or marketing companies of sanitary napkins and diapers should explore the

possibility of using all recyclable materials in their products or they shall provide a pouch or wrapper for disposal of each napkin or diapers along with the packet of their sanitary products.

•All such manufacturers, brand owners or marketing companies should educate the masses for wrapping and dis posal of their products.•The manufacturers or Brand owners of sanitary napkins and diapers shall provide a pouch or wrapper for disposal of each napkin or diapers along with the packet of their sanitary products.

•All such manufacturers, brand owners or marketing companies shall educate the masses for wrapping and dispo sal of their products.

•All such brand owners who sale or market their products in such packaging material which are non- biodegrad able should put in place a system to collect back the packaging waste generated due to their production.

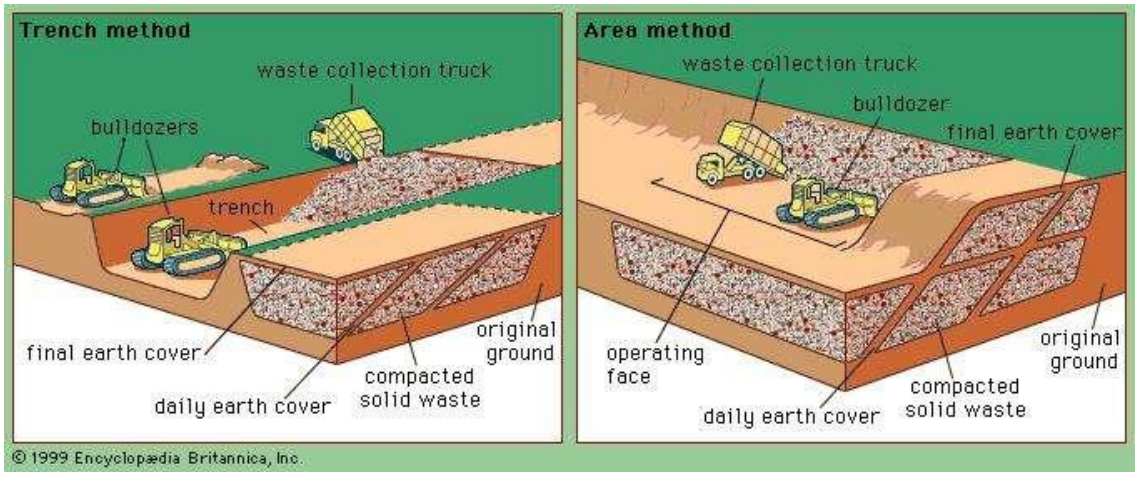
The concept of partnership in Swachh Bharat has been introduced. Bulk and Institutional Generators, Market Associations, event organizers and Hotels and restaurants have been directly made responsible for Segregation and Sorting the waste and manage in partnership with Local Bodies:

4. METHODOLOGY

4.1. LANDFILLING

As far as the waste management techniquesare concerned landfilling is the simplest. Afterreceiving the waste from centralized or decentralizedcapturing of the waste it can be successfully deposed.However, The

present days situation does not permitthe exercise of landfilling because it occupies space as well as pollutes the underground water Friends ofearth have described earth as 'Dumping rubbish' inthe ground or in the waste mountains, and have setout the drawbacks of land fill as :a) Release toxins, b)Threatens our quality or life.



4.2. INCINERATION

Incineration refers to the combustion ofwaste materials, which results in formation ofresidues and gas emission. It is a controlled burningof solid waste at extremely high temperature-often ashigh as 2000°F.Waste to energy concept refers to anincinerator that incorporates technology to generatepower from the heat produced during

combustionprocess. Incineration produces dioxins and furanswhich are hazardous for health. The process ofincineration is somewhat different; utilizing twocombustion chambers; gases generated in the firstchamber are more completely combusted in thesecond, providing the primary environmentalpollution control. Negative environmental consequences of incineration mostly revolve around air borne mixture.

5. BIOLOGICAL RECYCLING

Biological recycling is a process ofrecycling which involve degradation by means ofbacteria, fungi or algae and is broken down into abiogas, (CO_2 for aerobic degradation and CH_4 foranaerobic degradation) and soggy biomass for plantfertilizer. The biodegradable by–products are thennaturally recycled back into cycle of earth. Biologicalrecycling or organic recycling transforms organicwaste into a reusable resource through composting.Biological recycling of plastic waste can be dividedinto two methods, anaerobic digestion (AD)

andaerobic composting (AC). Aerobic digestion is thebio-degradation of organic matter in absence ofoxygen utilizing anaerobic micro-organisms. The ADprocess reduces green house gas, is a renewablesource of energy and reduces soil and ground watercontamination butthe main problem associated withAD process is that bacteria are fluid and temperaturedependent and have complicated mechanism etc.Aerobic composting uses natural process to increasethe rate of biological decomposition of organicmaterials. Win draw-based and in-vessel technologiesare two composting independent of renewable energy production and has continual operations.

6. CONCLUSION

Landfills are part of an integrated system for the management of MSW. When carefully designed and well managed within the context of the local infrastructure and available resources, landfills can provide safe and cost-effective disposal of a city's MSW. Nevertheless, municipal landfills, whether controlled dumps or sanitary landfills, should not be treated as panaceas for deficiencies in the region's overall waste management needs. Landfills are not designed for the routine disposal of industrial or hazardous waste, used oil, or other special wastes. If they are consistently pushed beyond their design limits, landfills, like any other engineered system, will fail. Such failure can have dire consequences for human health and the environment as the landfill then degrades into a potentially toxic open dump. An integrated MSWM system may prioritize its waste management options according to waste minimization, materials recovery/recycling, composting, incineration, and landfilling. Incineration is only a sound management practice under particular conditions. At present, these generally do not occur in MSWM systems with limited capital and technical resources. All the other components of the integrated approach can improve landfill operations and extend the life of the facility.

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