



WASTE UTILIZATION AND MANAGEMENT: TO REDUCE ENVIRONMENTAL POLLUTION

Sharmila R. Kubde

Associate Professor
Matoshri Vimlabai Deshmukh Mahavidyalaya, Amravati

Corresponding Author's E-mail ID: sharmila.kubde@rediffmail.com

Abstract:

Waste has an adverse effect on environment, therefore rational and economical ways of waste management is to be urgently addressed and implemented. The presence and disposal of waste generated due to growing urbanization and over consumption has been a more serious problem today. Thus, the planning and reorganization of strategies to treat these increasing amounts of waste need to be developed.

Keywords: RO (reverse osmosis), MSW (mixed municipal waste), MHT (mechanical heat treatment), AWT (advanced waste treatment)

Introduction:

Despite the nutritional qualities of animal-based products, fruit and vegetables, the wastage of these is very high along with the waste of package and bags mostly made up from plastics. This paper aims to provide information to balance current consumption of products against their high wastages to meet the existing and future challenges in waste management.

Animal waste utilization:

Livestock wastes from animal industry (poultry/dairy farms), can be a valuable fuel resource as well as a potential hazard to environment if not manage properly. Excessive contributions of some minerals from animal manure can create high salt concentration in the soil. Nitrate leaching has been considered a major nitrogen (N) pollution concern with livestock farms. Ammonia toxicity to fish & altered effectiveness of chlorination are other concerns. Phosphorous (P) entering surface waters can stimulate growth of algae & water plants (Paik et al 1996).

Current environmental issues relate to water & air quality, soil degradation, climate changes & energy deficiency. The first waste management option to consider is to manage feed composition & dietary





regiments to avoid overfeeding & to reduce excretion of undigested components of animals. Next option is to use the waste as a fertilizer at rates that meet crop requirements. Commercial fertilizers produce acids when added to the soil. Animal manure is an age old practice & one that is encouraged for effective crop production & maintenance or even improvement of 'soil health' (Lavkulich 1995). The methods used for animal waste treatment includes aerobic composting, anaerobic composting & vermicomposting. The objectives of these process is to conserve available N,P & K in the product which is used as a fertilizer, help to retained minerals & made available to the organisms in the soil.

The reverse osmosis (RO) system is used for waste water treatment in animal farms to remove hazardous elements from the water. The produce water is so clean that it can be reused. Manure is also used as a fuel. The energy value of manure depends on the composition of the litter and the moisture content. Samples of air dried broiler litter have 13.5gj/tonne(i.e. about half that of coal) combustion produces an ash which retains most of the P&K present in the original litter & provide valuable byproduct as a fertilizer (Dongall 1993).

The animal manure is biodegradable & it is made up of various organic and inorganic nutrients and can serve as a source of nutrients for both plants & soil when managed properly.

Waste management in urban areas:

The poorest residents living in densely populated areas dispose of their waste openly & indiscriminately. The municipality has also an open dumping site. The pollution caused by non bio degradable substances such as plastic bags, is also one of the area of major concern.

Issues that relate to liquid and solid waste management are serious challenges to the municipality and all the agencies charged with their removal. The planning & reorganization of these services must be sought with all the stakeholders (Muchukuri & Grenier 2009). Waste disposal authorities need to develop and implement strategies to treat an increasing amount of biodegradable municipal waste and to utilize the residues in ways that minimize environmental impact.





In order to identify the most effective, sustainable and appropriate treatment routes for the new generation of biodegradable wastes, a complete understanding of their physic-chemical characteristics is required. Many waste samples from mixed municipal waste (MSW) were untreated, others had been either partially or fully stabilized in either aerobic or anaerobic biological treatment systems, or had been treated by autoclave mechanical heat treatments (MHT) i.e. treated thermally by autoclaving at a temperature of 160°C for 30 minutes. The aerobic DR4 and anaerobic BM100 tests were designed to determine the reduction in biodegradability achieved by MBT. Mechanical and biological treatment systems treating mixed MSW (mixed municipal waste) (Godley et al. 2007). Aerobic decomposition by microbial agents converts biodegradable organic matter into oxidized by-products such as carbon dioxide and water. Anaerobic decomposition occurs without the presence of oxygen. Anaerobic conditions occur when sufficient oxygen cannot enter pore spaces due to excess moisture, fine particles size or compaction. This will produce biogas which is mainly consists of methane and carbon dioxide. The DR4 and BM100 values were much greater for the mixed kitchen and green waste. The role of government is very critical. Strong leadership is needed to discourage the use of hazardous materials like plastic bags. Government has to play pivotal role in encouraging and guiding people and industries to use biodegradable materials for packaging or for carrying products. Also, create a national waste minimization strategy. It is clear that we need to rethink what we are eating, as well as how it is produced, distributed, processed, sold, prepared and disposed of (Strategy Unit, 2008). In 2006 the United Nations food and agriculture organization released the report which linked the consumption of diets high in animal products with many of the world's ecological problems (FAO, 2006). This report has built a platform for action and policy-making around food, health and environment.

Waste Disposal & Recycling:

The waste industry is typically comprised of waste management operator who deals with collection, consolidation, sorting, recycling, processing and disposal activities (Morgan & Scholar, 2007). Today very low





percentage of waste is recycled. Cooking and preparing too much was also highlighted as a major cause of wastage (Ventour, 2008). When not aerated and managed properly food waste breaks down to produce methane and hazardous gases i.e. hydrogen sulphide and ammonia (Tsai, 2008). Alternative waste technology or Advanced Waste Treatment (AWT) refers to the recovery of resource value from municipal solid waste through a combination of mechanical, biological and in some instances thermal processing, Beyond reducing the greenhouse gas emissions of organic waste breaking down in landfills, AWTs result in the production of useful outputs such as energy, compost and other recyclables and stabilize the material to reduce leachate formation (SCECA, 2008). To create a sustainable society, the nutrients in household biodegradable solid waste and wastewater have to be recycled to agriculture. If the nutrients present in wastes from society were recycled, the use of fossile resources would decrease and so would the undesirable effects arising from discharge of water recipients (Vinneras, 2001). A constant increase in the volume of municipal waste can be explained by the rapid development of civilization and a higher standard of living (ROSIK-DULEWSKA, 2007). The presence has a negative effect on environment. In order to fully implement the pro-environmental waste management, we need to take more responsibility for the education and the ecological culture of all citizens to get aware of ecological issues to segregate biodegradable waste. After segregating bio-waste from a waste stream, the most justifiable way of its neutralization is anaerobic fermentation with biogas recovery, aerobic composting or vermicomposting and when it is required combustion with energy recovery. Neutralizing segregated organic waste can take place on various levels, at a municipal, communal compost sites or household compost areas (JEDRCZAK, 2007). In the process of vermicomposting it is possible to neutralize various organic wastes e.g. sewage sludge, post-production wastes from markets and restaurants wastes from wine and paper factories (Kostecka, 2009). The production of earthworm's body biomass which is rich in protein can be used as a food supplement for fish, poultry and other animal.





Conclusion:

Government has to play a pivotal role to develop a national anti waste campaign to encourage all sectors to cut their waste like plastics and other hazardous materials through regulations and incentives. The local councils/bodies like Zhilha parishad, Grampanchayat, Nagarparishads are best suited to address localized barriers to consumption of wastes. Social organizations will also help to create awareness among people and industries for minimizing waste. Lastly, government and industries has to increase R & D funding for inventing new technology for waste management.

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