Bioreactor landfills: A panacea for management of municipal solid waste



The disposal and management of municipal solid wastes (MSW) generated due to population explosion, affluence, haphazard planning, rapid urbanisation and industrialisation, in the present day scenario, are a major concern. Often, landfilling has been the most opted and popular option for disposing the large volumes of MSW, mainly due to the convenience associated with it. Incidentally, in the recent times, enhancement of the microbial activity is being used as a panacea to degrade the municipal solid waste. In this context, a Bioreactor Landfill (BLF) proves to be a promising solution.

In a BLF, the leachate generated during the decomposition process is collected, stored, treated and recirculated to facilitate (i) rapid decomposition of the waste, (ii) to achieve concentrations of the pollutants in the leachate within the permissible limits, in a short duration, (iii) rapid generation of landfill gases that could be used for the energy starved society and (iv) be economically feasible. However, due to non-segregation of the decomposable and non-decomposable wastes, research is pursued on a field scale in studying the feasibility of the technology in degrading the waste by studying the mechanical, physical, chemical properties of the MSW samples exhumed from BLFs during different phases of degradation. The enrichment of the leachate by micro-chemo methodologies to enhance its potency to degrade municipal solid waste is also to be studied. Research in the context of employing advanced instrumentation to monitor the temporal and spatial variations of the properties of the MSW within a BLF during its degradation would facilitate flawless execution of the technology. Moreover, extensive research in identifying sustainable applications of mined residues from a BLF is also mandated.

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