8. CONCLUSIONS

Medical wastes are classified according to their source, typology and risk factors associated with their handling, storage and ultimate disposal. The segregation of waste at source is the key step. Reduction, reuse and recycling should be considered in proper perspectives. Construction of a Medical waste Materials Recovery Facility (MED-MRF) will reduce the quantities of medical waste requiring landfill or incineration. Risk associated with the handling and disposal of Biomedical Waste, contaminated with body fluid, anatomical waste, etc., is very high.

Biomedical waste originating from, hospital, physicians’ clinic, pathological laboratories, etc., is only 10-15% of the total solid waste, but highly dangerous. Safe disposal of these wastes is expensive; therefore small health care facilities cannot afford to handle these wastes. With this in view, Government of India has made clear guidelines for local administrations to provide central treatment facility for safe disposal of biomedical waste.

Incineration used to be the method of choice for most hazardous health care wastes and is still widely used. However, little is documented about the physical health of community members who live close to incinerators. Most hospitals (close to residential area) no longer operate their incinerators due to more stringent regulations regarding air pollution emissions. The use of proper APCDs during incineration would significantly reduce the carcinogenic potencies associated with PAH emissions from HWI/MWI to the residential area, which was not installed at the site of case study of CTF.

Health care professionals in hospitals have been concerned about the proper management of infectious waste because of aesthetic concerns, state regulations, and the fact that certain wastes have been associated with transmission of infection or injury. The purpose has been to rationalize waste management, reducing the amount of waste needing special treatment and lowering costs, while at the same time maintaining occupational safety and preventing environmental hazards.
The fundamental information for selecting and designing the most efficient treatment method of hospital waste is obtained by means of waste composition analysis. The final choice of treatment system should be made carefully, on the basis of various factors, many of which depend on local conditions including the amount and composition of waste generated, available space, regulatory approval, public acceptance, and cost.

There is a growing interest in the treatment of ash because of the potential toxicity of hazardous heavy metals. Solidification of fly ash coming from a biomedical waste incineration plant in cementitious matrices reduce the leachability of the heavy metals in this material so as to permit its disposal in a sanitary landfill requiring only a low degree of environmental protection. High temperature melting treatment of incinerated hospital waste ash produced stabilized product, which is proven to be non-hazardous.

Municipal Corporations, State Governments, and the Central Government need to plan and construct centralized facilities to recycle, treat, and dispose of biomedical waste. Large-scale enterprises should be encouraged to recycle, to treat, and to dispose of wastes by means of constructing facilities, and to have extra capacities available on a reasonable fee. Partnerships with health care organizations, energy service providers, equipment vendors and industry associations are required as the way to optimize energy use and reduce costs. The reduction of hospital waste, the control of polluting and toxic emissions, the avoidance of unnecessary disinfection procedures and disposables, and the implementation of energy and water saving technologies are practicable measures in hospital ecology.

For planning and construction of facilities, it is required to have a tool to estimate rate of biomedical waste generation. Present thesis embodies such a tool to predict biomedical waste generation throughout the year. The rate of biomedical waste generation depends strongly upon nature of illness of patients being admitted to hospitals, and nature of illness is affected by season of the year. This is why a definite trend in waste generation rate with seasonal variation as well as distinctive specialty of health care facility is observed.
After calculating seasonal variation, waste generation rate $W$ (kg/day) was calculated for three hospitals (IGMCH, KNH, and DDUH) individually with their respective occupancy. It is observed that the sum of waste generated from these hospitals is between 10 to 15% less than the total waste incinerated at the CTF. This indicates that most of waste received is from these three hospitals and rest (nearly 15%) is from other two hospitals (IH & SS). The proposed model enables waste managers to make long term strategies by comparing among several waste management options and waste treatment technologies throughout the year for a given bed occupancy. It can be used either at a regional or national level for the purpose of setting guidelines for biomedical waste treatment. It can also be used at local level with the purpose of choosing a more environmentally beneficial strategy. The other benefits of the proposed model can be in reducing the risk in biomedical waste handling, especially where waste has to be transported to a large distance for incineration by proper planning during peak season.

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