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Recent technology for treatment of municipal solid waste in Chidambaram area

Er.T.Kavimani

M.E, Assistant Professor in Department of Civil Engineering, Annamalai University

E-mail: tkavimani@gmail.com

Abstract:
Municipal Solid Waste Management plays an important role in sustainable development. Zero waste is a latest visionary concept for confounding waste problems of our society. The idea has been implemented in various sectors including municipal waste, mining and construction. Recently solid waste management practices have incorporated with updated technologies to tackle modern challenges in the field of municipal solid waste management. This article has briefly described latest municipal solid waste management technologies and parameters, which should be keep in consideration while choosing the technology for implementation.

Keywords: Municipal Solid Waste Management, treatment, waste disposal

INTRODUCTION

Municipal solid waste (MSW) production has rapidly enhanced in previous years. Since 1960, waste generation has drastically increased by a factor of 2.6.[1] The treatment of MSW should be effectively safe and most importantly, it should be environmentally sound. Reduction, reuse, recycling, sorting, segregation, processing, and disposing are major steps of integrated waste management.[2] Solid wastes could be defined as non-liquid and nongaseous products of human activities, regarded as being useless. It could take the forms of refuse, garbage and sludge. The knowledge of the current status of waste disposal options and level of awareness of solid waste management will help the government and sectors involved in waste management to take action to establish and reinforce appropriate waste collection and disposal option and environmental education and awareness on waste management. Developing countries like Italy, Japan, USA, and UK are practicing zero waste concept municipal waste management; they are introducing modern ways of waste collection and storage, methods of incineration, pyrolysis, plasma gasification, aerobic and anaerobic digestion, vertification and deep slurry injections. The conventional energy resources are declining nowadays hence a suitable substitute for conventional resources are being explored.

Objectives of the study

To review of the present status of solid waste management in terms of source segregation and collection existing adequacy of staff, existing transportation, and treatment and disposal arrangement.

To protect public health, the environment and natural resources (water, land, air) through proper management of solid waste.

To promote the ecological management of solid waste in compliance with the principle of the 4Rs - Reduce, Reuse, Recycle, Recover and safe disposal in municipal.

To improving the efficiency of MSWM activities, thereby leading to the reduction of waste generation, separation of MSW and recycling and recovery of materials.

To suggest the suitable and efficient treatment option for the dumpsite of Chidambaram so as to comply with Municipal Solid Waste (Management and Handling) Rules 2000.

Materials and methods

DESCRIPTION OF STUDY AREA - CHIDAMBARAM MUNICIPALITY

Chidambaram is located at a distance of about 250 km south of Coimbatore. This town is geographically situated 97° 44' East longitude and 11 24' North latitude and well connected by major district roads with the adjoining towns such as Cuddalore and Pondicherry towards north at a distance of 43 Km and 65 Km respectively. It is also connected by CCP cum Bye Pass - Chidambaram Municipality broad with Sirkali towards South and Bhuvanagiri towards North West direction at a distance of 20 Km and 13 Km respectively.

The Tamilnadu State map, Cuddalore District map and Town map are. Chidambaram Municipality spread over an area of 4.80 sq.km. The Chidambaram Municipality 34.25 t and same is consists of 33 wards with a

Corresponding author: Er.T.kavimani

population of 64000 (as on 2014). The daily generation of garbage collected mostly through Tipper Lories by the local Administration. The per capita generation of solid waste is 0.535 kg/clay. The unsegregated waste is being dumped in the disposal yard of 4.58 acres, which is located at a distance of about 1 km from the municipal limit.

Processing and disposal of waste

By practicing source segregation, the biodegradable, inert, recyclables shall be segregated separately and they have to be processed/ disposed as depicted.

1. The solid waste is being disposed in the dumping yard near ommakulam [Chidambaram Trichy road] of 4.58 acres which is located at a distance of about 4 km from the municipal limit. The site is in adequate for processing and disposal of solid waste.
2. The Chidambaram Municipality owned a sewage form land of 60 acre which is available at Lalpuram village of Mel-BhuvanagiriPanchayat at 3 km from Chidambaram limit. Integrated SWM facility may be launched scientifically in this same site.
3. Cost estimates for various processing technological such as biomethanation, Composting and sanitary landfill for the processing of garbage

Adopting land and building occupation procedures for all constructional promotions and backyard composting at residential level to be encouraged.

Table 1: Summary of cost estimates for waste processing technologies

Technology	Capital cost in millions	Operation and maintenance in millions	Annual net revenue in millions	Payback period in years	Environmental issues
Biomethanation	111	26.35	32.45	3.5	No significant
Composting	12.40	11	2.62	4.7	Green house gas emission leads to global warming
Sanitary land fill	8.68	8.54	-	-	Ground water pollution
Bio reactor Landfill	68.15	13.40	24.0	2.85	Nil

Considering the revenue, pay pack period and environmental issues, it is recommended to adopt the landfill bio reactor technology for sustainable disposal of the solid waste.

Institutional aspects and capacity building

At present solid waste management is under the public health wing of the municipality. For fixing accountability, there should be adequate delegation of fiscal and disciplinary powers to the officers and the supervisory staff responsible for managing solid waste. The subject of solid waste management is so far being handled by sanitary officer. Appointment of qualified Environmental Engineer may help to improve the situation. The Municipality shall develop and maintain a management information system on solid waste for strict monitoring of the services. Health checks-ups shall be provided for all workers and staff associated with solid waste management.

Finance It is the responsibility of the local body to find fund for solid waste management The basic principle of polluter pay should be made applicable to the household, shops, hotels etc in respect of garbage generated to mobilize finance.. The details of charges proposed in collected from different waste generators to make sustainable financing of solid management is worked out.

CONCLUSION

A strategic planning study was carried out in Chidambaram Municipal area of Cuddalore District. In this study, the present situation of the Chidambaram Municipal area was characterized, shortfalls and constraints were identified. In order to turn this strategic vision for development of the solid waste management into practical reality, action plan was developed.

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