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Assessment of Municipal Solid Waste Management of Dindigul City Using Geospatial Tools

Selvabharathi G[a1], Adishkumar S[b], Rajeshbanu J[c], Jeyakumar.P[a2] and Ajith kumar.M[a2]

[a] Assistant Professor, Department of Civil Engineering, SSM Institute of Engineering and Technology,Dindigul, India.

[b&c] Head of the Department, Department of Civil Engineering,
University VOC College of Engineering, Thoothukudi, Tamil Nadu India.

[c] Department of Civil Engineering, Regional Centre of Anna University, Tirunelveli, Tamil Nadu, India.

[a1,2] Final year students, Department of Civil Engineering,
SSM Institute of Engineering and Technology,Dindigul, India.
selthi2003@gmail.com

Abstract: Solid waste management is among the basic essential services provided by municipal authorities in the country to keep cities clean. Due to industrialization, rural to urban migration and high growth rate of population have induced rapid urbanization in developing countries like India. The urbanization created acute problem of solid waste management. The per capita waste generation rate in India has increased from 0.75 kg per day in 2010 to 1.5 kg per day in 2017; such a steep increase in waste generation within a decade has severed the stress on all infrastructural, natural and budgetary resources. Dindigul is one of the fastest developing city, it generates total quantity of waste is about 6500 tons per day. So, there is need of the proper waste collection, transportation route for prevention of environment form the hazardous waste disposal. The proposed work emphasizes on the assessment of detail process of solid waste management such as collection, storage, segregation, transportation, treatment and disposal by using Geospatial tools like RS, GIS and GPS. It may help in sustainable urban environment of Dindigul city.

Keywords: GIS, GPS, Remote Sensing, Municipal Solid Waste Management, Sustainable Urban Environment

I. INTRODUCTION

Solid waste comprises unwanted and discarded materials from houses, street sweeping, and commercial and industrial operations. Increase in urban population and changing life styles lead to the generation of solid waste. Generally, solid waste is heterogeneous in nature such as mixture of vegetables, food items, paper, plastics, rags, glass etc. If solid waste is disposed off on land in open areas, then it causes a negative impact on the environment, ground water and on health. The most common problems associated with improper management of solid waste include diseases, odor nuisance, fire hazards, atmospheric and water pollution, aesthetic nuisance and economic losses (Jilani, 2002). There has been a significant increase in solid waste generation in India over the years from 100 gm per person per day in small towns to 500 grams per persons per day in large towns. Currently most of the municipal waste in India is being disposed unscientifically (Akolkar, 2005). Generally municipal solid waste is collected and deposited in landfill such unscientific disposal attract birds, rodents and fleas to the waste site and create unhygienic conditions (Suchitra, et al. 2007). The degradation of the solid waste results in the emission of carbon dioxide (CO2), methane (CH4) and other trace gases. The unscientific landfill site may reduce the quality of the drinking water and causes the disease like nausea, jaundice, asthma etc (Bean, et al. 1995). In Dindigul city primary sources of solid waste are local households, commercial establishments, hospitals, hotels, restaurants, and markets. The total quantity of waste generated per day is about 1300 to 1400 metric tons (approximate generation per capita per day is 500 grams). Dindigul Municipal Corporation is responsible for collection, storage, segregation, transportation and disposal of all solid waste generated in the city. In the present research work describes an attempt to assess the collection, segregation, transportation, treatment and disposal of DMC land fill site using geospatial tools like Remote Sensing (RS), Geographical Information System (GIS) and Global Position System (GPS).

II. SIGNIFICANCE OF STUDY

Dindigul city generates large amount of solid waste. This large amount of waste poorly disposed and untreated. The city does not have an engineered or scientific landfill site and the capacity of existing dump site cannot cater the future demand of the waste generated. So, there is an immediate need for designed scientific integrated solid waste management system using Geospatial tools like Remote Sensing, GIS and GPS to minimize adverse effects on environment, social and economic of solid