Chapter 4

Modeling and Prediction of Zone of Critical Concern: A Solid Waste Management Case of a Higher Education Institute in India Using Probit Regression

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ABSTRACT

The on-campus residence and activities of students, faculty members, visitors, and university staff result in the generation of university campus solid waste (UCSW). An accurate forecast of UCSW generation is crucial for proper on-campus waste management. This chapter, therefore, aims at identifying significant variables that affect the excess production of waste at a higher education institute in Kozhikode in the Indian state of Kerala. The study is expected to improve the waste management

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program therein. A literature review methodology, along with a series of interviews, has been used to frame and execute a questionnaire-based study where waste management staff provides the required responses. The modeling technique used is a Probit regression. The influential variables that affect the excess generation of waste are average education level, the status of employment, the urban background of most residents, consumption of water and electricity, space understudy, and management control. All the results in this research can be utilized as a part of waste management programs and in improving capacities to manage waste. This will also help in understanding the type of areas that are zones of critical concern in terms of waste management. The observations incorporated in the study is in the Indian context and are unique among the existing literature.

INTRODUCTION

Since the dawn of human settlements and residential living areas, solid waste has been a major concern. The practice of municipal waste management can be traced back to the People of Crete, Greece’s largest island, in about 1500 BC. The citizens used to practice dumping the rubbish in large pits and covered it with dirt. One of the earliest laws concerning an organized form of municipal waste management may be seen in the history of Athens, Greece in about 500 BC. The law requires the dumping of trash at least a mile out of residential living area/town, and they were not allowed to dump on the streets. During the middle ages, the problem of solid waste was common across European cities, and the severity touched its maxima in 1349 with the Black Death/Bubonic plagues. The plague reduced half of Europe’s total population. Beyond health, in the 1400s, the mountain of garbage just outside the city of Paris in France interfered with the city’s defense arrangements. Then in 1893, German used technology to manage the solid waste with its first solid waste incinerator. With time new technologies, laws, and regulatory policies were introduced to manage solid waste in cities and other parts of the country (Uriarte, 2008). The practice and concerns related to solid waste can even be seen in ancient Asian civilization like the current day Republic of India or the former Hindustan and various manuscripts like the ancient literature of Kautilya’s Arthashastra (The Maurya’s period). In Arthashastra, it was stated that that maintaining sanitation of habitat was essential and inevitable for a good quality of life. The Hindu society was aware of the code of conduct or Dharma relevant to waste management in the residential areas/Kingdom, and cremation of dead human bodies was one of such practice (Sharma and Upadhya, 2009; Gottlieb, 2003). Even an elaborate sanitary and drainage system was a characteristic of ancient Indus Valley Civilizations (Drains, 2019).
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