

An Analysis of the Fayoum Governorate in Egypt's Rural Areas' Sustainable Solid Waste Management

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Abstract

Due to the growing population, particularly in developing nations, and the lack of an adequate waste management service, municipal solid waste generation and disposal are major environmental issues in both urban and rural communities. In order to choose a suitable treatment facility and enhance the waste management system, the current effort intends to research the waste management system in rural areas. Due to the flaws in the waste management system, three villages in Markaz Etsa, Fayoum Governorate, were chosen as research areas. Characterization studies in these three communities, where MSW management services are either non-existent or insufficient, are therefore of the utmost importance and a significant step forward in reaching the larger objective of sustainable municipal solid waste management [1,2]. The outcomes revealed indicating the proportion of organic in these three communities is, respectively, 76%, 67%, and 80% without diapers, or 9.3%, 14.3%, and 5.8%. WRATE software was used to carry out and simulate three life cycle assessment scenarios [3,4].

Keywords: Municipal solid waste management, Rural area, Strategic waste management, Environmental analysis, Life cycle assessment

Introduction

The potential for global warming, acid rain, eutrophication, and resource depletion are areas where the values for the anaerobic and composting scenarios are equal and identical. The anaerobic and composting categories produce greater results than the land fill scenario in the domain of acidity. Eventually, the feasibility analysis demonstrates that the compost treatment plant is the best option for the current municipal solid waste scenario in order to achieve annual savings by a certain percentage during the course of the project. Also, the availability of places in Fayoum makes the compost option advantageous [5,6]. The Egyptian government has begun reclaiming a sizable desert area close to these communities, thus the governorate will be used for land reclamations. Everyone is aware that the municipal solid trash produced by rural families is a big global challenge. The majority of the garbage produced in rural regions is organic and

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results confirmed the method's robustness and effectiveness when higher variances between the estimated and actual values of the unknown parameter are present, as well as when the system network experiences unforeseen disturbances. In a genuine case study related to the Tehran MSW system, another model is presented. Findings indicate that composting is the worst option for municipal waste disposal, whereas anaerobic digestion and incineration perform better in terms of sustainability indicators [11,12]. There have been numerous studies on turning solid waste from landfills into valuable materials to lessen trash there and the need for further landfills and dumpsites. A novel multiobjective mathematical programming model that takes into

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