Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://omicron.ch.tuiasi.ro/EEMJ/

"Gheorghe Asachi" Technical University of Iasi, Romania

PREDICTION OF E-WASTE GENERATION BASED ON GREY MODEL (1,1) AND MANAGEMENT IN BOTSWANA

Daniel Mmereki[1,2*], Baizhan Li[1], Md. Uzzal Hossain[3], Liu Meng[1]

[1]*Faculty of Urban Construction and Environmental Engineering, Chongqing City, 400045, P.R. China*
[2]*College of Civil Engineering, 174 Shazhengjie, Shapingba District, Chongqing University, Chongqing City, 400045, P.R. China*
[3]*Department of Civil and Environmental Engineering, The Hong Kong Polytechnic University, Hung Hom, Hong Kong*

Abstract

This paper seeks to enumerate the quantities of e-waste in Botswana from 2000-2019, with a view towards formulating an effective and sound waste management strategy. Due to a lack of complete historical records on e-waste quantity and quality, this was achieved by the Grey Model GM(1,1) forecasting method. Our estimations indicate that an average weight at about 293.18 tons of e-waste will be generated in 2019 in the country. Considering an economic lifespan of between 3 and 10 years, more e-waste is expected to be produced annually. This paper also highlights key societal factors influencing successful implementation of sound e-waste management. These include the introduction of legislation dealing specifically with e-waste, establishment of formal take-back systems, integration of the informal recycling sector into the formal recycling sector, innovative technologies and investment. The effective management of waste from this sector should involve consideration of the toxicity and value of some of the components and materials of electrical and electronic equipment (EEE) and the prevailing inappropriate disposal practices for such potentially "toxic" materials.

Key words: Botswana, e-waste, e-waste policy, Grey Model (1,1), value recovery

Received: March, 2014; Revised final: January, 2015; Accepted: January, 2015

[*]Author to whom all correspondence should be addressed: e-mail: dani.mmereki2@gmail.com; Phone:+86 15123964440; Fax:023 65120771