

## DEVELOPING AN EFFECTIVE WASTE MANAGEMENT SYSTEM IN LIBYA

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### ABSTRACT

Solid wastes represent a major environmental and public health problem in most developing countries of the world. This study critically evaluates the current solid waste management system in Africa; the effects on public health, the environment and the possible ways of developing a more effective solid waste management system. Data were collected from desktop studies of published literatures and records of municipal solid waste management. Data collected were analyzed using a qualitative approach. The study revealed the possible causes of poor solid waste management in developing country to include; poor funding, increasing population, lack of adequate waste management facilities, lack of skilled personnel, poor environmental awareness, ineffective by laws/policies, politics. The study also divulge some potential effects of poor solid waste management to include; diseases, flooding and global warming amongst others. Some of the possible ways of developing effective solid waste management include proper integration of all stakeholders, adequate funding, establishing and enforcing relevant waste management legislations/ by-laws, the use of local collection methods and proper town planning for remote or inaccessible areas, and provision of modern waste management facilities.

**Keywords:** Solid wastes, environmental and public health problem

### INTRODUCTION

Poor solid wastes management system have resulted to major environmental and public health problem in many developing country. Municipal solid-waste is all waste collected by private and public authorities from domestic, commercial and non hazardous industrial sources [6], [1], [10], [11]. Over the years the health and environmental problems resulting from the solid waste disposal in developing country have become a major concern. Most developing countries are often faced with solid waste management problems different from what is obtainable in developed countries [1]. Some of such differences may be observed in the areas of composition, access to waste for collection, density, political and economic structure, quantity of waste, awareness and attitudes [7], [3]. This may be due to the fact that the socioeconomic conditions in developing countries are different from those of the developed world [8], [9].

Various studies have been carried to determine influential factors affecting waste management systems in developing countries. Solid waste management has been considered a major challenge in developing countries mainly due to the increasing generation of waste, the burden posed on the municipal budget as a result of the high

costs associated to its management, the lack of understanding over a diversity of factors that affect the different stages of waste management and linkages necessary to enable the entire handling system functioning [6]. Igoni et al 2007 explained that solid waste management has become a major challenge facing the environment and health of the public especially in developing countries of the world. Ogunbiyi 2001 argued that the standard of waste management system of a country has a direct impact on the health and environment of the people. Increasing population levels, booming economy, rapid urbanization and the rise in community living standards have greatly accelerated the municipal solid waste generation rate in developing countries [8].

The rapid growth of urban population, increasing economic activities and lack of modern solid waste management facilities and training in developing countries has hindered the efforts to improve solid waste management services in most developing countries [9]. Solid waste management is hampered by lack of reliable data at all levels, thus making it difficult for proper waste management planning [10], [11].

Nabegu, 2010 explained that people's attitudes influence the volume and characteristics of the waste they waste generate, as well as the effective demand for waste collection services. For instance, waste recycling can be improved by encouraging members of the public to co-operate in waste separation and purchasing of recycled products. Adequate solid waste management system can only be maintained in the presence of modern practicable waste disposal technology (Ludwig et al. 2003). The volume of solid waste generated has continued to increase at a faster rate than the financial and technical ability of respective environmental regulatory agencies. The amount of solid waste generation is highly influenced by the population income of a country [6], [1], [13].

## **RESEARCH METHODOLOGY**

Secondary data were collected for the purpose of this study. The process of data collection was carried out after establishing the research problem and the study design. Inferences and conclusions for the study were drawn from the secondary data collected. Qualitative approach was adopted for this study so as to provide a view point of the present situation and thus enhances a well written technical report that will adequately explain the observable findings (Myers 2002)

## **PROBLEMS OF SOLID WASTE MANAGENENT**

In most developing countries, solid waste generated by the public is dumped at designated collection points in mixed form without treatment. This crude practice has resulted to the loss of valuable, recyclables or reusable materials. This has also affected the cost of waste collection, transportation and disposal [6], [12]. In most urban areas, stationary containers system is used for waste collection; the waste containers remain at the points of generation. This method requires the delivery of waste by the public to the stationary containers placed along street ends or junctions.

An open dumping system is the commonly used method of solid waste disposal in Nigeria, this method has been reported to have adverse environmental and public health consequences including soil and groundwater contamination by toxic metals, air pollution, odour, as well as constituting a breeding ground for harmful organisms such

as rodents, snakes and mosquitoes [4], [9]. However in many developed countries of the world, well planned landfill sanitary systems are in use.

The ways and manner in which solid waste is generated, collected and disposed is largely influenced by several factors including; age, educational status, climates and the cost of collection services. Proper management of these factors could bring the desired solution to the waste management problems in developing countries [6], [1], [5], [13].

Dauda and Osita, 2003 observed that while substantial efforts are made for the urban cities for waste management services, little or no provision is made for waste collection and disposal in local communities. Solid waste collection is to limited part of the public, especially those in the cities. One major reason for the limited coverage is the lack of accessibility. Most of the roads leading to such areas are too narrow for collection and transporting equipments to access; these areas are mostly inhabited by low income earners that have building without adequate land planning [12].

Conventional system of solid waste management is capital intensive, and involves the use of modern technology and equipments. [6], [10]. In situations where such funds are not available to environmental management authority, proper waste management becomes almost impossible [13]. Most of the field environmental agency personnel have little or no formal training in waste management or engineering and so their involvement in such operation will eventually result in inefficient solid waste management.

Climatic factors including temperature and humidity plays a major role in solid waste management system. heat and humidity increases the municipal moisture content of solid waste, which in turn increase the weight of the refuse. The high humidity and temperature increases the rate of decomposition of the organic part of the waste, leading to problems, thus making it more difficult to handle and dispose such waste, with direct effects on the environment and health of the waste workers and the residents [6], [10], [12].

Other problems of waste management system in Libya include the lack of proper recycling or reuse of resource programs and periodic environmental awareness and educational programs [11].

The environmental problems from poor waste management practice and the associated health risks, ultimately affects the economy. The problem of improper solid waste management is more severe in rural communities in Libya and other developing countries. [6], [10], [1]. It is an established fact that the state of human health is largely influence by the environment they live, the quality of water they drink, the type of food they eat, and the quality of air they breathe [8]

## **SOLID WASTE MANAGEMENT SYSTEM IN DEVELOPED WORLD**

In developed countries, most solid wastes generated could be considered as resources, because of the evolution of modern technology that converts waste into valuable resources [9], [2]. Harmful industrial waste, bottles, plastics tins, and other hazardous materials are effectively separated at the waste collection point. Environmental

regulatory bodies or the local authorities in these countries provides color coded bin for the different types of waste to facilitate the proper handling and sorting of the waste, thus enhancing the recycling of valuable materia. [6] , [10], [2], [11].

Waste management services in Libya and other developing countries have been considered to be inadequate from the process of storage, collection, transportation to the point of disposal. [1], [5].

## CONCLUSION

Various studies have been carried to determine influential factors affecting waste management systems in developing countries. Solid waste management systems in most developing countries pose a serious threat on the environment, people and economy of the nation. Solid waste is a challenge mainly due to limited resources and inadequate management and technical skills within municipality authorities. As such integrated waste management should be considered as an alternative and most promising system for waste management.

Valuable and recyclable material in the waste are often disposed with the waste without any proper means of recovering such waste. Integrated approach involving private companies, non-governmental organization, shop owners, landlords, local media, households and all government agencies should be adopted in order to achieve sustainable development. It involves the separation of waste from source and collection, followed by reuse and recycling of valuable components by anaerobic digestion, gasification, incineration etc.

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Published by STEF92 Technology Ltd., 51 "Alexander Malinov" Blvd., 1712 Sofia, Bulgaria

Total print: 5000

**ISBN 978-619-7105-64-3**

**ISSN 1314-2704**

**DOI: 10.5593/sgem2016B42**

**INTERNATIONAL MULTIDISCIPLINARY SCIENTIFIC GEOCONFERENCE SGEM  
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**30 June – 6 July, 2016**

**Albena, Bulgaria**

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