Available online at www.sciencedirect.com

ScienceDirect

Procedia Earth and Planetary Science 15 (2015) 590 – 595

Procedia
Earth and Planetary Science

World Multidisciplinary Earth Sciences Symposium, WMESS 2015

# Project on Solid Waste Recycling Plant in Sakarya University Campus

Füsun Boysan[a*] , Çiğdem Özer[a] , Muhammed Has[a] , Mehmet Murat[a]

[a] *Sakarya University, Faculty of Engineering, Esentepe Campus 54187 Serdivan, Sakarya, Turkey*

**Abstract**

The inevitable result of life, wastes and waste management, has become a neglected issue for years; and it is time we consider the negative influence on natural environments. Waste has increased due to the increase in population, technological development, industrialization, urbanization, which is rapidly increasing and changing consumption, furthermore it has become an important issue nowadays for the environment as well as the human health.

Waste management is a topic, which should be dealt with the system approach. The system approach is; waste management should involve waste formation, collecting, processing and removal as well as energy, protection of environment, protection of sources, increase of productivity, and employment as a whole. A system approach of waste management should deal with the removal of the waste from the human environment and furthermore protect and improve human health. In this project, we aim to dispose Sakarya University's waste by establishing a recycling plant making waste re-usable.



Peer-review under responsibilty of the Organizing Commitee of WMESS 2015.

*Keywords:* Solid waste; recycling; excaviation; waste managment.

## 1. Introduction

Materials, which have been used, are no longer wanted or are harmful to the environment, are referred to as waste. In biology, sweat, urea and feces are also referred to as waste. Excavation waste and sewage sludge should be removed systematically for the protection of the environment. Waste is related to human development via technological and social development. Different kinds of waste have shown different variation time between the industrial improvement and the materials that have been used. For example with the emergence of plastic and

* Corresponding author. Tel.: +90 (264) 295 54 54.
*E-mail address:* fboysan@sakarya.edu.tr


Peer-review under responsibilty of the Organizing Commitee of WMESS 2015.
doi:10.1016/j.proeps.2015.08.108

nuclear technology, new waste types have appeared. Furthermore there are also some waste types that are recycled according to its economic value (Tchobanoglous et al. 1993; Kreith, 1999).

Types of waste according to the waste management are in the following bellow; (Kreith, 1999)

- House, commercial and construction waste
- Dangerous industrial waste, which threats human health
- Medical waste
- High level waste such as nuclear, which has a risk of exploding

Increasing amount and fluctuating composition of waste makes waste control and waste management harder as the increase of life standards change. With the increase of pollution composed by solid waste and the related potential risks with diminution of the natural sources, economical and other reasons make solid waste management become more complicated. The component steps of waste management must be known well and all relations integrated. (Guerrero et al. 2013; Pankaj, 2014-2015).

The constantly increasing population, together with an advancement of the living standards, appearance and consummation of the new products for the demands of society cause reduction in natural resources. The re-use of used package and similar reusable waste as a source of raw material management also help the economy. Similarly, petroleum could be saved more by recycling plastics (Pankaj, 2014-20015; Ludwig et al. 2012). It is possible to create an economical advantage and protect the environment by collecting and recycling solid waste. The recycling of paper, cardboard, can, glass, metal, plastic, fabric and other such materials as a source for industrial use without mixing(or separating from) organic waste will increase their economic value. In this study, the contribution of paper and plastic waste collection and recycling has been economically evaluated in Esentepe Campus of Sakarya University.

## 2. Waste management

Waste management aims to remove the waste that has been produced by the management system and reduce the influence of the waste on the environment and economy. The shortest way to reach that goal is to naturally reduce the amount of waste. Integrated waste management can be defined as choosing and using the correct method, technology and management programs for a specific waste management objective. At the same time, integrated waste management is supposed to make sure that legal procedures are fully applied. When we look at today's hierarchy of integrated waste management we can see Fig. 1, (Guerrero et al. 2013, Ludwig et al. 2012).

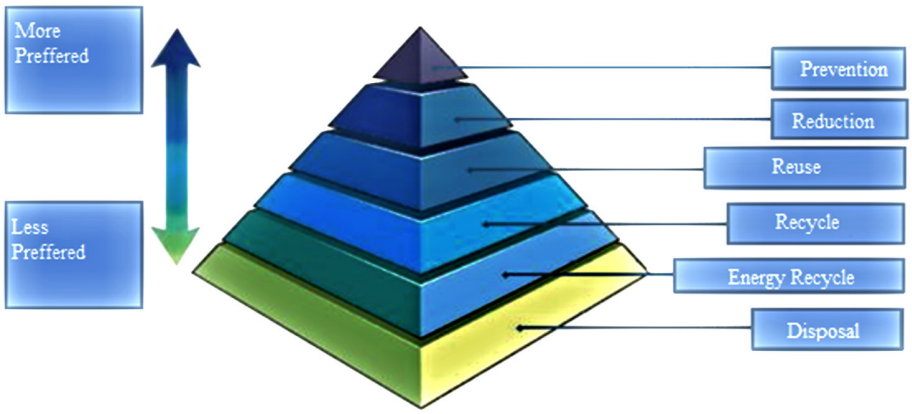


Figure 1. Integrated Solid Waste Management Pyramid.