Available online at www.sciencedirect.com

ScienceDirect

Procedia Environmental Sciences 35 (2016) 692 – 700

Procedia Environmental Sciences

International Conference on Solid Waste Management, 5IconSWM 2015

Integrated Plastic Waste Management: Environmental and Improved Health Approaches

P. Singh, V.P Sharma *

CSIR-Indian Institute of Toxicology Research, Lucknow, India

Abstract

Plastics are integral part of society and have varied application. Plastics are composed of a network of molecular monomers bound together to form macromolecules. There are increasing concerns due to non degradability and generation of toxic gases on combustion during incineration. Due to fabrication of desired shape colour and specification convenient to customers there is increasing application in packaging, agriculture, automobiles and biomedical. They are indispensable to the modern generation due to development in information technology, intelligent and smart packaging system. Efforts are in progress for development of efficient and precise conversation of renewable raw materials into innovative polymeric product through recent technologies which are superior in terms of performance, environmental and cost perspectives. In rivers and at coastal regions the marine pollution is increasing at a faster rate due to indiscriminate disposal by the consumers. R&D studies are now centred for investigating whether consumption of plastic debris by marine organism translates into toxic exposures for people who consume seafood with particular relevance to plasticisers, stabilizers, heavy metals viz phthalates, BPA, lead cadmium, methyl mercury. Biological effects from pollution are linked with resulting economic effects and losses. A cornerstone of sustainable development is the establishment of affordable, effective and truly sustainable waste management practices in developing countries.

Plastic waste management is a critical issue. Over 300 million metric tons of plastics are produced in the world annually and about fifty percent of this volume is for disposal applications, product that are discarded within a year of their purchase. It is the boon and bane of our times. Although there are multiple uses, its waste and the resultant pollution clogs up our rivers, oceans, lands and adversely affects the biodiversity. We need to plan for disposal of new synthetic product, implants etc which have completed their shelf life. In future polymeric adhesives and implants are to be developed which address total joint replacement features for patients with varied complications and age. It should be robust, biocompatible with surface treatment options to allow for reduced friction and wear throughout the implant life. In a CPCB supported study we have found that the soil and ground water quality may be affected in dumpsite areas.

* Corresponding author.
E-mail address: vpsitrc@rediffmail.com

1878-0296 © 2016 Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
Peer-review under responsibility of the organizing committee of 5IconSWM 2015
doi:10.1016/j.proenv.2016.07.068

The International Organisation for standardization [ISO] Organisation for Economic Cooperation [OECD] and development, British specification [BS] Indian Standards [IS] need to be implemented for appropriate application and safe disposal. Globally steps are being taken for development of environmental friendly, innovative plastic items using the concept of green chemistry and also with safe disposal methods. Integrated waste management practices are to be encouraged, strengthened and supported with state of art scientific applications.

© 2016 Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Peer-review under responsibility of the organizing committee of 5IconSWM 2015

Keywords: Plastic, Waste, Integrated, Intelligent Packaging, Degradable;

Introduction

Environmental concern caused by inadequate waste management as well as the steps to combat global warming promotes actions toward a sustainable management of organic fraction of the waste. Integrated waste management combines a variety of strategies for both waste management and waste reduction. It may involve burying waste in sanitary landfills and burning waste in mass burn incinerators. Solid waste management has become an issue of increasing global concern as urban populations continue to rise and consumption patterns change. Plastic is the general term for a wide range of synthetic or semi synthetic organic solid materials**.** Plastics are typically polymers of high molecular weight. They are usually synthetic, most commonly derived from petrochemicals, but many are partially natural. A polymer may contain other additives like plasticizers**,** stabilizers**,** lubricant**,** UV absorbing material**,** flame retardants to improve performance. Plastics have permeated every facet of human life such as packaging**,** agriculture**,** water transportation**,** building construction**,** telecommunication**,** education**,** medicine**,** transportation**,** defence**,** consumer durables to name a few**.** One of the reasons for great popularity of plastics is due to tremendous range of properties exhibited by them because of their ease of processing**.** Hence the demand for plastics has been increasing in modern living to improve the quality of life**.** The quantum of plastic waste in Municipal Solid Waste (MSW) is increasing due to increase in population, development activities and changes in the life style. The health and environmental implications associated with Solid waste management are increasing specially in the context of developing countries and regulatory requirements for environmental clearance. While systems analyses largely targeting well-defined, engineered systems have been used to help SWM agencies in industrialized countries since the 1960s, collection and removal dominate the SWM sector in developing countries. We should understand that the waste produced in the course of health care activities carries a potential risk of infection and injury than any other type of waste. The development of a national policy for proper waste treatment may be a significant step to abate Green House Gases (GHGs) emissions through controlled composting processes, mechanical biological waste treatment, waste air treatment etc with methodological prerequisites for proper measurement, data interpretation, planning, adequate financing, team work and administration.

Global Trends and Mitigation Strategies

Quantifying global trends requires annual national data on waste production and management practices. Estimates for many countries are uncertain because data are lacking, inconsistent or incomplete; therefore, the standardization of terminology for national waste statistics would greatly improve data quality for this sector. A wide range of mature technologies is available to mitigate green house gases emissions from waste. These technologies include land filling with landfill gas recovery, post-consumer recycling. composting of selected waste fractions and processes that reduce gases generation compared to landfilling Therefore, the mitigation from waste relies on multiple technologies whose application depends on local, regional and national drivers for both waste management and mitigation. Many developed and developing countries practise composting and anaerobic digestion of mixed waste or biodegradable waste fractions (kitchen or restaurant wastes, garden waste and sewage sludge).

Download English Version:

https://daneshyari.com/en/article/4401424

Download Persian Version:

https://daneshyari.com/article/4401424

Daneshyari.com