Nature & Environment
Vol. 23 (1), January 2018: 1-3
Website: www.natureandenvironment.com

ISSN (Print) : 2321-810X
ISSN (Online) : 2321-8738

RESEARCH ARTICLE

Implementation of Technologies for Energy Conservation for Sustainable Environment and Society: An Opinion

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Received: 18th January 2018, Revised: 22nd January 2018, Accepted: 30th January 2018

ABSTRACT

Sustainable development not only conserves resources (including land) but also reduces long-term costs associated with maintaining infrastructure and supplying essential services. Efficient development also maximizes the availability of human resources to businesses, which translates into long-term economic viability that is less subject to the volatility associated with fluctuating energy and raw material prices. Sustainable development and social sustainability are concepts promoted as the basis for sound future development and economic growth. Pollution prevention should be recognized as a core part of sustainable development and long-term planning. Pollution control approaches and technologies can assist business and communities in implementing sustainability. Sustainable practices are designed to eliminate reliance on finite resources and maximize efficiency.

Key words: Environment, Sustainable development, Technology implementation, Pollution control

INTRODUCTION

The human requirements to manufacture new innovations have lead to pollution that is still being emitted as smoke from factories and inhaled. The waste such as of chemicals and toxic substances are produced in factories and is discharged in nearby water bodies which are continuously being ingested by the lower society of people in the form of drinking water. The WHO states that one sixth of the world's population, approximately 1.1 billion people do not have access to safe water and 2.4 billion lack basic sanitation. Polluted water consists of Industrial discharged effluents, sewage water, rain water pollution (Ganguly, *et al.* 2011).

The environmental consequences of rapid industrialization have resulted in countless incidents of land, air and water resources sites being contaminated with toxic materials and other pollutants, threatening humans and ecosystems with serious health risks. Over the course of the twentieth century, growing recognition of the environmental and public health impacts associated with anthropogenic activities has prompted the development and application of methods and technologies to reduce the effects of pollution. Environment pollution is a worldwide problem and its potential to influence the health of human populations is great (Ganguly 2013).

Green technologies encompass a continuously evolving group of methods and materials, from techniques for generating energy to non-toxic cleaning products. It focuses on meeting the needs of society in ways that can continue indefinitely into the future without damaging or depleting natural resources.These nature friendly methods may vary from development of alternative fuels for energy production, to green chemistry and green nanotechnology(Ganguly, *et al.* 2011; Ganguly 2013).

MANAGEMENT OF WATER POLLUTION

Water is essential to humans continued existence, environment and the financial expansion and can provide income to large number of people and come first for broader social and economic

developments. Ensuring a clean, healthy and sustainable water supply is now the highest of natural resources management issues. Agriculture, fishery, livestock and tourism livelihoods could thus be sustained long-term by integrating a united approach to ecosystems for water conservation. Water is the central part of sustainable development. Water resources and the services help in the poverty reduction, economic growth & environmental sustainability. Nearly, 37.7 million Indians are affected by water-borne diseases. Annually, 1.5 million children are estimated to die of diarrhoea alone. Waterborne diseases and water caused health problems are mostly due to inadequate and incompetent management of water resources. Poor sanitation, improper storage of water and lack of proper waste disposal are the main causes of water contamination (Wakchaure, *et al.* 2017).

The pollutants in water and wastewater can be removed by means of physical, chemical and biological treatment. The polluted water is treated preliminary through the removal and disintegration of gross solids i.e. grit. Oil and grease are also removed at this stage if present in large amounts. This is followed by sedimentation process, after which microorganisms are added to dissolve the colloidal organic compounds present therein. Further treatment of a biologically treated effluent is done to reduce BOD, bacteria, suspended solids, specific toxic compounds or nutrients to enable the final effluent to comply with a standard more stringent before discharge. Lastly the sludge is dewatered, stabilized and disposed (Wakchaure, *et al.* 2015).

Methods for cleaning up oil spills include bioremediation by use of microorganisms or agents such as the bacteria Alcanivorax or *Methylocella silvestris*. Other methods comprises of addition of oleophilic, hydrophobic chemical that acts as a herding agent in water and on the surface, floating molecules to the surface of the water, forming gel-like agglomerations (Wakchaure, *et al.* 2015, 2017).

ENVIRONMENT FRIENDLY TECHNOLOGHIES FOR AIR PURIFICATION

Air has been polluted as a result of many other anthropogenic activities such as disposal of carcass by burning methods. An alternate environment friendly technology to combat this pollution is to incinerate the dead body. In case of animal carcass, rendering can be done. After the carcass has been skinned, the raw materials are cut into pieces of suitable size. The material is loaded in to dry render, a sterilization machine. When pressure inside the machine is raised, the moisture is converted in to steam, which creates an internal steam pressure and causes sterilization of the material. The process is continued until final products are dry. Free fat drains away as an end product (Kamble and Ganguly 2016).

Geo-sequestration, method involves injecting carbon dioxide, generally in supercritical form, directly into underground geological formations. Various physical (e.g. highly impermeable caprock) and geochemical trapping mechanisms would prevent the CO_2 from escaping to the surface. CO_2 is sometimes injected into declining oil fields to increase oil recovery. Disadvantages of old oil fields are their geographic distribution and their limited capacity, as well as the fact that subsequent burning of the additional oil recovered will offset much or all of the reduction in CO_2 emissions (Kamble and Ganguly 2016).

MANAGEMENT OF CONTAMINATED SOIL

Climate change, biodiversity loss, deforestation, air and water pollution are not confined by human-imposed boundaries as waterways, watersheds, oceans, biodiversity, ecosystems and the atmosphere tend to span countries, continents or the globe. Perhaps the most ubiquitous international environmental issue is climate change. The environmental degradation and pollution affects throughout the entire life cycle of a product or process. The contamination of land with toxic metals has become a worldwide problem, affecting crop yields, soil biomass and fertility, contributing to bioaccumulation in the food chain. Phytoremediation is an ecological technological approach introduced for prevention of land contamination (Praveen, *et al.* 2017)

Control of soil pollution includes the following steps:

1. Collection of Waste

2. Disposal of waste

3. Recovery of resources
4. Collection of waste.

The waste products are to be collected in a common place to aid the common treatment processes as a whole. In industries it is done through pipeline to avoid the exposure to greater environment during transport. In municipality it is done in periodical collection in closed containers or plastic bags. Disposal of Waste, Usually land fill method is adopted to dispose solid waste. In this method the waste is put into a deep pit and then covered with soil (Praveen, *et al.* 2017).

CONCLUSION

Phytoremediation is an environmental friendly technique, which is safe and cheap way to remove pollutants. Phytoremediation involves the introduction of plants for assimilation of contaminants. These plants are capable of cleaning heavy metals, pesticides and xerobiotics, organic compounds, toxic aromatic pollutants and acid lime drainage. The phytoremediation of heavy metal contaminated soil involves extraction and inactivation of these metals in soil. However metals like Pb are largely immobile in soil and their extraction is limited. Hence chelating agents have been developed to chemically enhance phytoextraction by mobilizing metals and increasing metal accumulation. Phytoextracted plants are further harvested for metal recovery and use.

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