

Current State of Plastic Recycling in India

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Abstract

Plastic waste is non-biodegradable and its disposal and recycling is one of the major problems faced by India. In developing nations like India, materialist infrastructure is still improving; plastic plays a big role in these infrastructure improvements but is one of the deadliest in the list of most hazardous modern day materials. The effect of plastic on the environment is hazardous and thus the government is trying to promote recycling of plastic waste into various day to day products. Moreover the government has passed various new regulations for the effective disposal and recycling of plastic waste. Though there are various ways of recycling practiced in our country, most of them are haphazard and unplanned and thus their impact is not that powerful. We are sitting on a plastic bomb and plastic waste management is the need of the hour. In this paper we have studied and discussed about the various regulations set up by the government to curb this menace, the various hazards of plastic wastes on our surroundings and the current state of plastic recycling in India and what lies in the future for India.

1. Introduction

Plastic is one of the most widely used products in our day to day lives. Its versatility makes it even more useful. Products that are made out of plastics are folders, paperclips, window frames, food packaging, flooring, straws, car bumpers and bottles, from carbonated drinks bottles to detergent bottles. 42% of India's consumption of plastics is used in packaging. But plastic is a non-biodegradable material i.e. it cannot be broken down into simpler structure by the action of microorganisms thus posing a major threat to the environment. So tackling the plastic waste has become one of the major concerns of the government due to its life threatening hazards. India's growing population and economic development along with illiteracy related to environment issues are cited as major issues in degrading the environment in India.

With India's emergence on world stage as 2nd most developing nation in world, industries are building blocks of this development providing various innovative products which have made life easy for consumers, The dependence of human on all these products is increasing day by day and with a growth in population, more number of industries are established to produce these products in large quantity [1]. With the highly competitive environment in industries for advanced products, but the by-products of these industries are causing severe environment problems. These products are mostly associated with harmful gases and plastics. For giving coming generations a safer environment in terms of hazards related to plastics, need of the hour is proper management of plastics. It opens window for few options, namely dumping plastics into landfills, reducing the use of plastics, reusing the plastic products again and again and the last one is recycling. As landfill are only going to degrade land available, and reducing the use of plastics is not easily due to increasing population, reuse and recycling are key to plastic waste management.

Plastics recycling have become one of the most

important processes in manufacturing organizations which produce plastic products [2]. The widespread use of plastics demands proper end of life management. Recycling is a process to change waste materials into new products to prevent waste of potentially useful materials, reduce the consumption of unexploited raw materials, reduce energy consumption, lower air and water pollution by reducing the need for conventional waste disposal, and reduce the greenhouse gas emissions in comparison to plastic production. Report also gave data about recycling. Total plastic waste which is collected and recycled in the country is estimated to be 9,205 tons per day (approx. 60% of total plastic waste). So what happens to rest of 40% of the waste? Yes, it gets piling up and adding on to the environmental concerns of the nation.

Government of India has shown its concern in last three decades by introducing various policies and established the ministry of environment and forestry in 1985. According to data collection team of World Bank experts, between 1995 and 2010, India has made one of the fastest progresses in world in addressing environment issues and improving the standards of environment. Still India has to do a lot to match with developed nations.

This paper is organized as follows. In section 2 we have discussed the literature review done to complete this paper, and then we have listed the current government policies regarding plastic in Section 3. Section 4 contains the recycling practices in India in detail. Finally, Section 5 contains the summary of the paper.

2. Literature Review

Conventional and non-conventional are broad categories of environmental burdens due to plastics. Conventional environmental burdens due to plastic films include climate change, acidification, human health, land use, energy use, etc., which can be measured (Ross and Evans [3] 2003, Franklin [4] 2007). Non-conventional environmental issues include decrease in the soil fertility, blockage of drains, ill-health effects in animals due to ingestion of plastic waste, plastic waste disposal and

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treatment problems and unhygienic landscape due to litter of plastics [5].

Fletcher and Mackay [6] (1996) have proposed a model for recycling plastics. They have discussed about the reduction of waste due to various recycling methods and about the total waste obtained from the plastic recycling process and its importance. Many papers have also been written on the application of plastic to make something valuable. Converting waste plastic into fuel by Zадgaonkar [7] (2004), using plastic waste in road construction by Ministry of Environment and Forests [8] (MOEF 2005), plastic as useful textile auxiliaries by Shukla et al. [9] (2008), and using plastic waste for low-quality plastic products written by Narayan [10] (2001) are a few to name. Bio plastic is one of the attractive alternative way of dealing with plastic as its biodegradable (Ramani and Patel [11] 2000, Nayak and Swain [12] 2002, Camilla 2005 [13]). You can guess the amount of hazard plastic pose to the world by reading this quote "Over 18, 000 pieces of plastic are floating on every square kilometer of the ocean" – UNEP 2006 (Morrison & Ellenwood, [14] 2008). The growth of environmental concern has recently given reuse a new meaning (Dekker, 2006 [15]; Neumayer, 2003 [16]). The development to reuse and recycle products is not only because of the strict government policies but the industries see it as an economic advantage.

Plastics make up almost 13% of the municipal solid waste. Containers and packaging constitute the largest amount of plastic use according to a report by Central Pollution Control Board (CPCB). According to the report of Central Pollution Control Department (CPCD) of India, the total plastic consumption in India in recent past and it has been on an increase of about 20-25% yearly. Plastic consumption in India is estimated to reach the 12.5 million tons mark making India the 3rd largest consumer of plastics in 2012 after US and China.

Table: 1. Plastics Consumption in India

S. No.	Year	Consumption (Tones)
1.	1996	61,000
2.	2000	3,00,000
3.	2001	4,00,000
4.	2007	8,500,000
5.	2012	12,500,000

Source: Central Pollution Control Board

3. Current Active Government Policies in India

As sighted on the plastic waste management of India site [17]:

1. Carry bags will be in natural shade without any added pigments or made using only those pigments and colorants which are in conformity with Indian standards.
2. Using bags made of recycled plastics for any purpose related to food stuffs should be prohibited.
3. Manufacturing, stocking, distribution or selling any carry bag made of virgin or recycled or compostable plastic, which has a thickness of less than 40 microns should be prohibited.
4. Sachets made of plastic material shall not be used for storing, packing or selling tobacco and pan masala.

5. Recycled carry bags should meet to the Indian standard IS 14534:1998 titled as Guidelines for Recycling of Plastic which is updated from time to time.
6. Carry bags made from compostable plastics shall meet the Indian Standard: IS/ISO 17088:2008 titled as specifications for Compostable plastics, as updated from time to time.
7. Any form of Plastic shall not be used in any package for packing gutkha, pan masala and tobacco in all forms.

4. Recycling Practices in India

The backbone of the recycling industry is the rag pickers. They are the collection agents of the plastic needed for the recycling. The rag pickers make a living by selling what they collect from the dumpsites, bins and from along roadsides. This waste mostly comes from domestic, industrial and commercial sources. But these rag pickers mostly children below the age of 15 years are exposed to serious threats. These threats are mostly due to the hazardous wastes, sharp objects in waste and also the dogs near the waste propose a threat to the rag pickers. Reports suggest that the number of people involved in this work in India is increasing. The fact that the waste pickers live in worse conditions supports the argument that the occupation is a survival strategy. Thus we seriously need to automate the waste picking process to save these people from various life threatening hazards. Rag picking is detrimental to health (especially worm infestations and respiratory and other infections).

Municipal Corporation though trying its best to collect the maximum waste, and recycle or reuse it properly but despite its best efforts the municipal corporation has only managed to get its hand on 40-65% of the total waste generated in India. The rest of the waste ends up in open places like dumping grounds, roadside and even water bodies. This further causes a serious threat to the environment and thus adding up to its deterioration.

Incineration is also a practice followed which causes more harm than benefits. The waste in India is not the same as that in developed countries like USA. Our waste consists of a major part of wet waste as compared to the waste generated in USA which mainly consists of dry waste. Therefore we cannot follow the same process that they carry out to get rid of waste and generate electricity from it. India should stop following USA blindly and develop a method to recycle its waste the way that is more advantageous and safer for our type of waste.

5. Summary

As there is no secret about the hazards of the plastic waste so India desperately needs to get rid of the plastic waste problem as soon as possible. Even the apex court accepted that plastic waste in India is just like a bomb and the bomb is ticking. People assume that municipalities have the sole responsibility to manage waste, but they fail to realize that the rag-pickers have a very important role when it comes to waste management. Recently the rag pickers have been given some recognition in the society but there is still a lot to be done to make their lives safer and better. The government needs to stern on its stand on the ban of plastic bags which can still be seen being used in many shops in India. Moreover a better waste collection method is

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desperately needed so that the municipal corporation can work better and more effectively minimizing the open waste. There should be a proper reverse supply chain, starting from collection of plastic waste from every household and ending at recycling plant. As the collection of plastic waste is major bottleneck in recycling, proper collection system should come into existence, which is only possible with the help of government policies for better collection system. Like, there should be bins available in every society especially for plastic wastes, so that plastic waste will be easily available for recyclers and this reduces the cost. Likewise private firms should fulfill their social responsibility by recycling the industrial plastic waste as well as by setting up new projects related to plastic recycling. Media have to highlight all the recycling plastic projects, spread awareness among mob to increase their participation. Ministry of environment and forestry along with other government agencies and subsidiaries should encourage in opening of markets for recycled plastic wastes product. Companies should come up with innovative ideas

and technologies to maintain profitability as well as environment concerns.

The Indian government should initiate programs for recycling at individual level as well as industrial level so that each of them is responsible of whatever plastic product they are using. This can be done through tax incentives, tax rebates, sales of their collected commodities at less than current commodity pricing to recyclers and through new legislation that will regulate certain industries. The governments can also offer research and development tax rebates for businesses that will be willing to re-engineer their production process to accommodate recycling. For reducing the deadly effects of plastics, firstly 'reduce and reuse' should be implemented by each individual, after that 'recycling' should become option. Recycling, especially of plastics, should be one of the important activities in our lifestyle. We as the citizens of India need to understand our role in helping the government in waste management. We can begin at home by separating the biodegradable and the non-biodegradable waste thus doing our bit in making India an example for other countries that if we can you can.

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