



# Plastic Pollution in Cities of Mumbai and Thane

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## I. INTRODUCTION

Plastics is a polymeric clogging material that is a material whose molecules are very large, often resembling long chain made up of a seemingly endless series of inter connected links. Natural polymers such as rubber, and silk exist in abundance, but it is not a pollutant, they decay naturally, man-made plastic materials have been developed specifically to defeat natural decay process materials derived mainly from petroleum that can be molded, cast, spun or applied as a coating synthetic plastics are largely non-bio-degradable, and remain in the environment. The word plastic is derived from the Greek word (plastikos) meaning capable of being shaped or molded. The parties industry was revolutionized in the 1930s with the announcement of polyamide (PA) for better known by its trade name nylon. Nylon was the first purely synthetic fiber introduced by Du Pont Corporation at the 1939 World's fair in New York city. Pure plastic have low toxicity due to their insolubility in water and because they are bio-chemically inert. Plastic products contains a variety of additives some of which can be toxic e.g. Plasticizer like abdicates and phthalates are often added to brittle plastics like polyninyl chloride to make them pliable enough for use in food packaging toys and many other items.

### **EFFECTS OF PLASTIC ON ENVIRONMENT:**

Plastics are durable and degrade very slowly, the chemical bonds that make plastic so durable make it equally resistant to natural process of degradation.

A small but growing numbers of microbial communities capable of bioremediating plastics are being discovered. In 1975 a team of Japanese Scientists discovered a strain of flavobacterium, living in ponds containing waste water from a nylon factory that was capable of digesting certain byproducts of nylon. Several species of soil fungi can consume polyurethane the effect of plastics on global warming is mixed. If the plastic is incinerated to increase carbon emission, if it is placed in a landfill, it becomes a carbon sink. The controlled high temperature incineration above 850 for 2 seconds performed with selective additional heating breaks down toxic dioxens and furans from burning plastics and is widely used in Municipal solid waste incineration. Municipal solid waste incinerators also normally include flue gas treatments to reduce pollutants further. This is needed because uncontrolled incineration of plastic produces polychlorinated dibenzo-P-dioxens, a carcinogen (caner causing chemical) open- air burning of plastic occurs at lower temperatures and normally releases such toxic fumes.

### **RECYCLING:**

Thermoplastics can be re melted and reused. Thermoplastics can be ground up and used as filler, although the purity of the material tends to degrade with each reuse cycle. The biggest challenge to the recycling of plastics is the difficulty of automating the sorting of plastic wastes, making it labor intensive. The caps of PETE bottles are made from a different kind of plastics which is not recyclable. Recyclable products are not portable. The first success in recycling of plastics is vinyloop ,a recycling process and approach of the industry to separate PVC form other materials through a process of dissolution, filtration and separation of contaminations. In 1988, to assist recycling of disposable items, the plastic bottles institute of the society of the plastics bottles by plastics type. Industry devised a new familiar scheme to mark plastic bottles by plastic type.

e.g. PET (PETE) Polyethyelene tereplthalate  
HDPE – high density poly ethylene  
PVC – Polyvinyl chaloride.

### **COMMON PLASTICS AND USES:**

Plastics are used in an enormous and wide range of products, due to two manufacturing cost, easy to manufacture and imperviousness to water. They have replaced traditional materials like wood, stone, horn, bone, leather, paper, metal, glass and ceramic in many fields. Plastic is used in preparing, plumbing, toys, furniture, packing, making of containers, spare-parts of different machines, interiors etc. In India 42% plastic is used by packaging Industries.



PET: - Carbonated drinks bottles, plastic film,  
PVC: - Plumbing pipes, shower curtains, flooring, frames.  
PP (Polypropylene): Bottle caps, drinking straws. Yogurt containers, coir fenders (bumpers)  
PA (nylons):- Fibers, toothbrushes fishing lines.

## II. LITERATURE REVIEW

### **PLASTIC INDUSTRIES IN MUMBAI AND THANE:**

Major Industry in plastics is related to aerospace, constructions, electronics, packing, transportation general appliances & furniture.

### **Plastic Pollution:**

Disposable plastics are the greatest source of plastic pollution. Plastic bags, show, bottles, utensils, lids, cups offer a small convenience but remain forever. Follow “four Rs.” Of sustainable living. Refuse, Reduce, Recycle.

### **THE PROBLEM OF PLASTIC:**

The improperly disposed of plastics from cars, locals or houses, or left into an already full rubbish bin, or inadvertently carried off by a gust of wind, begin to pollute the environment landscapes littered by plastic packaging, have become common in many parts of the world, illegal dumping of plastic and overflowing of containment structures also play a role. Plastic have replaced the earlier material used in packaging, bottling industry i.e. glass, paper iron, and aluminum, these animals are less harmful than plastic. The plastic have a low recovery rate, inefficient to reuse as recycled scrap in the manufacturing process, due to significant processing difficulties such a low melting point which prevents contaminants from being driven off during heating and reprocessing.

### **POLLUTION BY PLASTICS ADDITIVES:**

Plastic also pollutes without being littered – specifically, through the readies of compounds used in its manufacturing, pollution of environment by chemicals reached from plastics into air, water. Some compounds used in plastics e.g. phthalates, biphenyl a (BPA) & polybrominated difhenyl ether (PBDE) are under close observation of law they are found in Medical devices, food packaging, automobiles upholstery, computers, pharmaceuticals, perfumes & cosmetics all these compounds have been detected in human being and as know to distural entocrine system they are also anti-androgens, & estrogen i.e. male & female sex hormones these things/compounds are also found in animals & effects this reproductive system.

### **SOLVING PROBLEM:**

Awareness of Plastic Pollution.

1. Zero Waste
2. Restriction of Plastic Industries
3. Finding alternatives – eco – friendly technology

What you can do about plastic pollution?

Personal Steps	Actions
Plastics bags	Discourage don't take buy cloth bag paperbass
Plastics bottles	Use glass or tin can bottles
Tiffin boxes	Stainless still which more hygienic life long durable
Utensils	Use steel aluminum, earthen plots, or utensils made of glass
Stationery pens folders etc	Discourage pen made of plastic use stationery paper less offices
Create awareness	Lectures through NGOS

Throwing a plastic bag or materials in garbage –precaution

Article in the Times of India Environment

“Plastic waste time bomb ticking for India SC April 4, 2013 – TNN

“We are sitting on a plastic time bomb, the Supreme Court said on wed, after the central Pollution control Board (CPCB) informed that India generates 56 lakhs tonners tries day of plastic western annually about 689.5 tones a day.

“The total plastic wastes which collected & recycled in the country can estimate to be 9,205 tones per day i.e. 65% of total plastic waste and 6,137 tones remains uncollected & littered. Accounting to CPCB.



The 4 metros are major culprits in generating such waste

Delhi	689.5 tones a day
Chennai	429.4 tones a day
Kolkata	425.7 tones a day
Mumbai	408.3 tones a day

40% plastic is not re-cycle means in

Delhi	275.6 tones
Chennai	171.6 tones
Kolkata	170 tones
Mumbai	163.2 tones

This waste in a source of continuing pollution as plastic is not bio degradable and poisons the environment every day

The court observed - that it was “failure of governance at grass root level” forced to adopt plastic waste management and handling rules 2011 effectively and Municipal bodies to take action.

#### ***NO LESSONS LEARNT, PLASTIC KEEPS PILING UP:***

Reported in the Times of India dated 26th July 2014.

#### ***Increase in Non-Biodegradable Waste Threatens to Choke City:***

Mumbai generates 7500 metric tons of waste every days, of which nearly 9 % of plastic waste. The data, obtained from a recent report, indicates the city has not yet learnt, its lessons despite the severe environmental impact of plastic, witnessed especially during the 2005 deluge where it choked drains, creeks and ultimately the city.

This is one problem where we will have to share the blame of the BMC. From littering the seaside with pet bottles to wrapping the flowers used in prayers and then just throwing them into the Mithi, citizens have added to the problem, Government agencies need to create more awareness about the hazards of indiscriminate disposal of plastic and citizens need to respond more responsibly to contain the problem.

The BMC's yet-to-be-released Environment Status Report for 2013-14 shows plastic accounts for around 675 MT of the city's total daily waste generated in that year. In fact, the quantum of plastic waste generated by the city has increased over the years. For instance in 2010-11, 10 % (650 MT) of the total, 6500 MT of garbage generated was plastic which dipped the following year to 9 % or 630 MT of the 7000 MT of garbage generated. While in 2013-14 too plastic accounts for 9 %, it has increased in absolute terms as the total waste generated is considerably higher.

#### ***Plans to Segregate Dry-Wet Garbage:***

- The dry wet garbage segregation plans has not had any large-scale impact as it was implemented only by a few housing societies.
- Moreover, the Bombay/Mumbai Municipal Corporation has installed separate color coded dustbins in the city for dry and wet waste, but Municipal Trucks collect them all.
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#### ***What Happens to the Plastic Refuse?***

- The Plastic is segregated at the dumping ground and dumped in a separate area, or a major portion is taken away by rag pickers.
- The Bombay/Mumbai Municipal Corporation doesn't have any plastic treatment facility.

#### ***How Plastic Affects the Environment?***

Low density plastic cannot be recycled. When burnt, it emits hazardous chemicals like poly-aromatic hydrocarbons. Often, at the dumping yard, this plastic is consumed by cattle and is known to enter the food chain as well through the cows' milk.

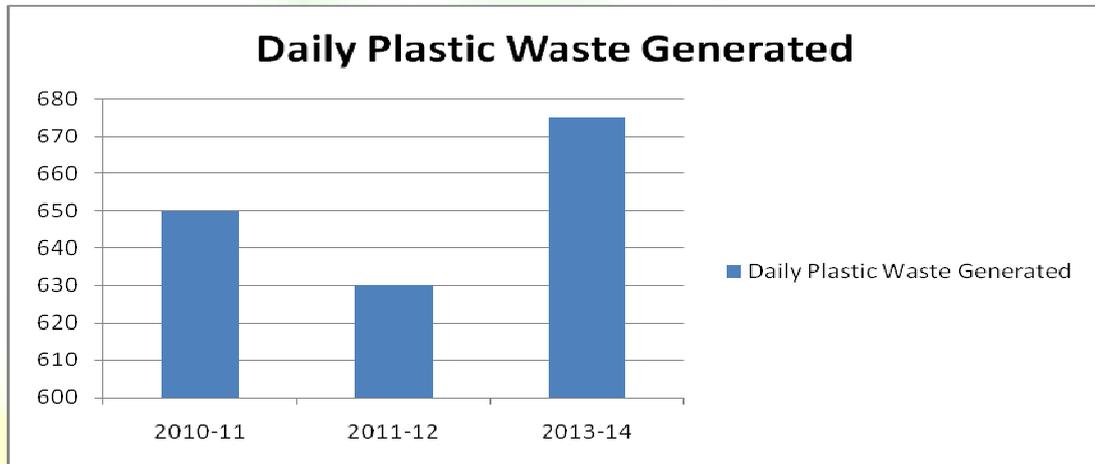
#### ***How to Dispose of Plastic?***

- Experts said citizens need to segregate dry and wet waste.
- Low-density plastic can be converted into granules and used to make roads.

**Civic Dumps are overburdened**

- The city’s dumping grounds have been used far beyond their shelf life and are overburdened.
- The BMC now dumps the City’s garbage only in two grounds, Deonar and Mulund, which too have long outlived their utility

**Figure-1**  
**Daily Plastic Waste Generated (in Metric Tons)**



**III. METHODOLOGY**

A survey was conducted in the City of Mumbai and Thane about 20 manufacturing units were cover and the following information was collected with the help of Questionnaires. The answers to the Questions by the responded were similar.

	<b>Question</b>	<b>Answers</b>
1	Types of Business	Small Scale Manufacturing Industry
2	Nature of Business	Plastic Manufacturing either raw material or finished products
3	Raw Material used	Raw plastic granules, polymers or chemicals
4	Is the raw material harmful	It is hazardous, low toxic
5	Does the unit generates waste	Yes less than 1 ton
6	Methods of disposing waste	Local Municipal facilities or few have contractors
7	Water consumption	Less than 10,000 liters units are small
8	Discharge of water	Routine drainage system
9	Pollution awareness	Yes
10	Comply with Rules/Laws	Yes

**IV. ANALYSIS**

Most of these units have obtained license under SSI and from Municipal Authorities, these units are very small scattered and manufacture either raw material for plastic Industry, or convert the plastic into finished products like, pens, bags, bottle, toothbrushes, utensils, plastic mugs, buckets, comb, all the items manufactured are of daily human use. Manufacturing plastic items does not create pollution, but plastic pollution is created by the products because they are not bio-degradable and cannot be recycled. It is “Once a Plastic is always a Plastic”. The manufacturing units do contribute to pollution because while cleaning machines and factories, very small particles of plastic material is washed away through drainage which pollutes water, and soil, if consumed by animals it can become harmful, it does effect flora and fauna, which the SSI unit personnel’s are unaware, they comply with rules, but still plastic manufacturing and selling of plastic items contributes to pollution, employees working in these units are aware about pollution but are not trained and understand the impact of their activities on Environment.



## V. CONCLUSION

Plastic is a man-made pollution, which has reached alarming situation in city of Mumbai and Thane. The research indicates, that the demand for plastic items are on increase, because of its durability and cost, but at the same time we are paying a heavy price, that is it has impact on our environment and disturbs the eco-system. Manufacturing and selling of certain plastic items should be totally discourage e.g. plastic bags and drinking water bottles, the situation is not completely under the control of authorities. The awareness about plastic as a pollutant is less, manufacturer and general public are less aware of Green Policies, Green Technology and Green HR.

## REFERENCES

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