

# Reducing Solid Waste Generation: Responsible Consumerism

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### **Abstract**

Solid waste management is most certainly one of the most critical issues facing India and more so urban India where the sheer scale of it is creating disastrous situations. Generally, this is considered a clear case of deficient (urban) governance where the infrastructure and logistics in place to collect, treat and dispose solid waste is woefully inadequate in comparison to what may be required. This is certainly correct. Urban India has unfortunately not got the required attention and support to measure up to the exponential growth it has known and is likely to continue so. However, if we accept the limitations of the governance delivery and the slow pace of any reform there, it may be useful to look at the root cause of this crisis which is solid waste generation. Citizens who largely think that solid waste management is the sole responsibility of the Urban Local Bodies or ULBs, which it definitely is, should be well aware of the fact that they are generating that waste and also play an equal if not greater role in terms of responsible consumerism that can drastically reduce the amount of waste generated. This term paper will look at the nature of household solid waste generated and then identify available choices to reduce its generation and new ways of looking at it.

## Reducing Solid Waste Generation: Responsible Consumerism

### Introduction

In April 2015 the Bombay High Court directed the Kalyan Dombilvali Municipal Corporation to stop issuing any building permissions until it had a comprehensive system for solid waste management in place<sup>1</sup>. At that time most Mumbaikar thought it was not a kind of problem their seasoned Municipal Corporation of Greater Mumbai would let arise. Most were unaware of situation at the 134 acres dumping site at Deonar, one of India's earliest. From 1927 to 2014 it is now the equivalent of an 18 storied building fed by 5500 metric tons of solid waste, 600 tons of silt and 25 tons of bio-medical waste daily and about 9000 tons of silt annually from pre-monsoon cleaning of the sewage and drainage lines<sup>23</sup>. Though Deonar has been in the news since 2008, with plans for modernization, PILs from local citizens etc. it was not until the fires in February and March 2016 that most Mumbaikar realized the gravity of the situation. There was a constant risk of severe air pollution within a 10km radius of the existing and upcoming residential areas of Govandi, Chembur, Wadala, Mahul etc. If this is the situation in one of the most seasoned and well-endowed Municipal Corporation in India one can imagine what may be happening in other lesser equipped cities. Not surprisingly the High Court has issued the same directive to the MCGM to stop issuing any new building permission till it has got its act on SWM together.

Quite naturally all eyes are on the MCGM; the citizens of Mumbai but also other ULBs across the country; and the measures it will take to address this very serious crisis. The fingers are squarely pointed to the MCGM and its failure to effectively deliver the most basic of civic services. There is obviously a lot to account for there. Though general environment of despair, anger and blame on the MCGM is quite understandable it also tends to de-responsibilize citizen from the very cause of solid waste generation... their consumer habits. Citizens cannot extract themselves from a problem they are at the origin of. There is no debate about their entitlement for a better SWM from the Municipal Authority but they should be equally concerned about the origin of the solid waste and the reasons behind the exponential rise in its volumes.

Between 2001 and 2011 the population of Greater Mumbai has grown from 16.43 Million to 21.66 M. The per capita SW generation has also increased from 0.45 kg/day to 0.514 kg/day representing total MSW of 7,395 TPD in 2001 and 11,124 TPD in 2011<sup>4</sup>. In 2011 the total MSW generated by urban India is 185,132 TDP and cities are gearing up for that figure to reach 278,480 TPD by 2021<sup>5</sup>.

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1 <http://indianexpress.com/article/cities/mumbai/hc-restrains-kdmc-from-approving-new-housing-projects-till-proper-waste-disposal-system-is-put-in-place/>

2 Suryawanshi, Sudhir (30 November 2010). "Soon, city will have no place to dump trash". Mumbai Mirror (Mumbai). Retrieved 23 March 2012.

3 Kunal Purohit; Poorvi Kulkarni (14 December 2014). "Maximum city, maximum garbage". Hindustan Times. Retrieved 1 January 2015.

4 Appendix 1, pg 129 of Reference 1

5 Appendix 2, Pg. 145 of Reference 1

Municipal Solid Waste Management is certainly going to be a big challenge for India. Not surprisingly it has been one of the areas of focus of the Jawaharlal Nehru National Urban Renewal Mission (JnNURM) a flagship policy launched by the Government of India, (GoI), in 2005. Already between 2006 and 2009 about 500 Million USD or 22.5 Billion INR were spent on 42 MSWM projects funded by the JnNURM<sup>6</sup>. Quite obviously where there is a crisis there is also business opportunity. It is hardly surprising that there is little or no attempt to address the question by tackling the root cause which is the generation of SW itself. The unbridled consumerism that is creating this waste is not questioned but rather considered as a given and constant situation. It may represent economic growth of a kind but it is quite clearly at the cost of the irreparable damage to our environment and great impact to our quality of life. The measures towards reducing the generation of solid waste are equally if not more important than exploring the most suitable ways of dealing with it. They would lay a stronger foundation for a more sustainable urban living. This is even more apt in the context of the extreme shortage of (land) resources available. It seems practically impossible to find another dumping site in Mumbai due scarcity of land but also because citizens do not want a mega-dumping site in their localities.

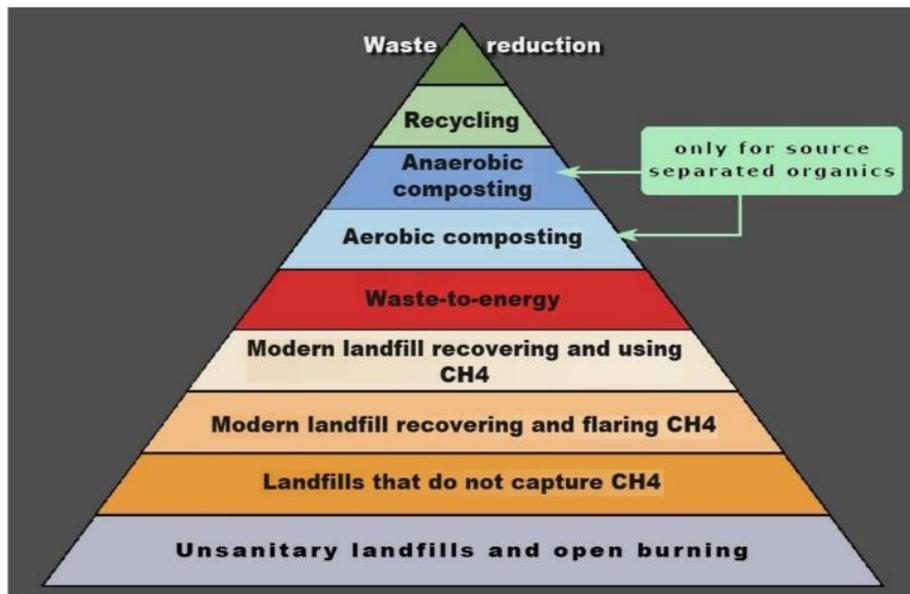


Figure 1: Hierarchy of Sustainable Waste Management

Source: Page 40. Reference 1

The 3Rs Reduce, Re-cycle, Re-use are now a common usage. But clearly there is more stress on the last 2 R's and little talk about the first one though it is at the top of the pyramid for measures for sustainable waste management. Refer Figure 1. The reason for that is quite clear. The other 2 R's involve industry and profit whilst the 1<sup>st</sup> will promote responsible consumerism. This paper will examine the nature of MSW and what simple measures at the household level could contribute in reducing its generation. To look at reduction of SW we will start by first looking at the composition of MSW in India and more closely in Mumbai.

<sup>6</sup> Page 111-112 Reference 1

**Composition of MSW:**

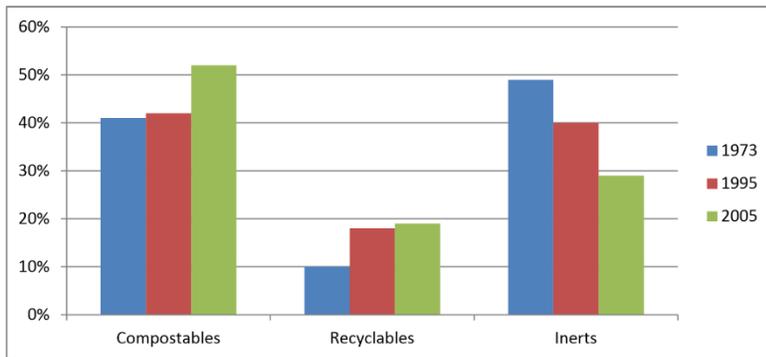


Figure 2: Change in Composition of MSW from 1973 to 2005 in Urban India. Source Page 35, Reference 1

Component	Fraction of component %
Kitchen waste	39.24
Fruit waste	8.33
Flower Waste	0.14
Green grass	0.62
Dry Grass/tree	9.58
Other organic material	3.79
Cotton waste	2.48
Wood chips/Furniture	0.95
Plastic	10.14
Paper	7.52
Thermocol	0.19
Glass	0.71
Rubber	0.52
Leather	0.67
Metals	0.19
Inerts	14.93
TOTAL	100

Figure 3: Composition of MSW in Mumbai 2009? By weight. Source: Reference 2



composting could be easier to deploy and avoid the tedious processes of community cooperation that can obstruct implementation of such initiatives. The example of the Bangalore based Daily Dump is particularly interesting. With design inputs the composter is elevated to a series of handcrafted terracotta jars of different shapes and sizes to handle varying capacities of waste generated. The products are sold on-line and supported by demonstrations and workshops in schools, housing societies etc. 29,370 users (till Feb 2016) recycle 25,385 kgs of wet waste daily.

Figure 4: Terracotta home composting jars. Source: dailydump.org

Solid waste is generally classified in 3 categories:

1. Compostable: Food waste, landscape or tree trimmings
2. Recyclable: Paper, cardboard, Plastics, Glass, Metals
3. Inerts: Stones and silt, bones and other inorganic material.

The moisture content in the above is also to be considered.

As the table in Figure 3 indicates

Kitchen waste, Fruit waste, Plastics, Papers and Inerts constitute the larger fractions of the waste. One must note that much of the recyclable components are recuperated by the formidable informal collection networks that operate in Mumbai like in most Indian metros before and after formal collection by the MCGM. The table still remains a good indicator of the waste generation pattern to examine how it can be reduced.

**Kitchen waste & Fruit waste:**

This constitutes about 50% of the total amount generated and indicates wasteful practices, quite regrettable in a society that is still battling with poverty caused mal-nutrition. In face of the recent fires at Deonar in Mumbai and resulting public outcry it appears that MCGM will make housing increasingly responsible for the waste they generate<sup>7</sup>. In case of kitchen and other organic material even home

7 <http://www.dnaindia.com/mumbai/report-soon-housing-societies-will-have-to-segregate-process-their-garbage-2197486v>

## Plastics:

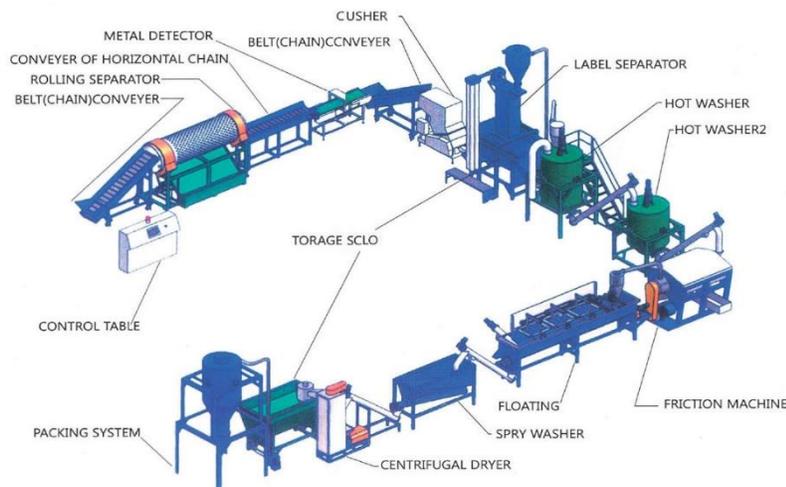


Figure 6: Process for Recycling of PET bottles.

Source: <http://riching-machinery.sell.everychina.com/p-101612602-pet-bottle-flakes-washing-line-recycling-machine.html>



Figure 5: 500ml PET bottle More packaging less water

bottled drinking water is a relatively recent and elitist practice that aggressive marketing is working hard to generalize. In addition to the avoidable waste generated the carbon footprint of a 1 liter bottled water is 2000 times that of point-of-use filtered tap water<sup>9</sup>. For bottles of smaller capacity that are currently being marketed that number will be significantly higher.

### New consumption habits:

All studies concur that urbanisation leads to an increase in per capita SW generation. The consumer habits and the composition of the waste bin has completely transformed in urban India fast adopting global norms in this regards. Quite simply there are several constituents of SW as we observe today that just did not exist in pre-liberalisation India. These are linked to the adoption of

This is the next largest component representing about 10% of the total MSW. Only reduction of use will reduce generation. Plastic bags, F & B packaging, use and throw items from pens to 'China made' toys and curios are literally piling up and choking us. Even in the smallest of villages one will invariably heaps of these. We must quite simply use cloth bags, reduce or even stop consumption of processed foods and beverages including drinking

water which generate a substantial amount of plastic wastes. If not recuperated for proper treatment (granulating / crushing) and recycling at an early stage that process is more cumbersome and inefficient.

Though recycling is now mandatory in Mumbai as per the High Court<sup>8</sup> directive from 1<sup>st</sup> April 2016 these processes consume high amounts of water and energy and the fact remains that if as consumers we can easily reduce the volumes of generating PET bottle waste. Consumption of

8 <http://timesofindia.indiatimes.com/City/Mumbai/Bombay-HC-asks-for-recycling-scheme-for-PET-bottles/articleshow/51316728.cms>

9 <https://www.rwlwater.com/bottled-waters-carbon-footprint-debated/>

use-and-throw culture, fast food consumption, increased used of cosmetics, processed food, bottled water and cold drinks etc.

Use and throw pens and pencils, razors, plastic cutlery, foam cups and dishes, spectacles but even watches, cameras add up to the avoidable waste that we generate for no real gain.



Figure 7: Use and throw, fast food, packaging of processed foods and FMCG

A University of Arizona study states an average of 14% of purchased food, 26% in convenience stores, 9.55% in fast food restaurants in the US is wasted<sup>10</sup>; add packaging etc. and it appears that which was meant to nourish us is being disposed as refuse. Hazardous foams causing ozone depletion, non-degradable plastics are an integral bi-products of our daily life. 92% of diapers containing hazardous chemicals end in land-fills; obviously after being baled and shipped out to the poorest countries<sup>11</sup>. Obsolescence is another value that creates waste particularly in fashion and electronics. Perfectly fine things are discarded due a perceived / imposed idea of obsolescence. Unfortunately, some of us are quick in adopting these wasteful ‘lifestyle’ choices in India mindless of the environmental and ethical impacts.

#### **Some consume others suffer:**

In South Asia Region the SW generation in kg/per capita/day ranges from 0.12kg to 5.1kg.<sup>12</sup> The alarming gap reflects the different consumption patterns between rural / urban poor and urban rich in the region who incidentally generate more waste then the outer range of 3.7 kg in the OECD countries. 44% of total MSW is generated in the OECD countries and globally around the same 46% of MSW is generated by the High Income. However, it is exactly those at the other end of the spectrum that suffer the most from the general degradation of the environment and the resulting health hazards; mosquitoes breeding in garbage dumps and non-sanitary land-fills, respiratory diseases due to air pollution caused by incineration of non-degradable and non-recyclable waste, contamination of water due to exposure to non-treated waste... Does purchasing power come with the right to degrade the environment and the living conditions of others? That is the simple ethical question that arises. One which must make us think when we ‘consume’.

10 Using Contemporary Archaeology and Applied Anthropology to Understand Food Loss in the American Food System by Timothy W. Jones. PhD Bureau of Applied Research in Anthropology University of Arizona.  
[http://www.ce.cmu.edu/~gdrj/readings/2006/12/19/Jones\\_UsingContemporaryArchaeologyAndAppliedAnthropologyToUnderstandFoodLossInAmericanFoodSystem.pdf](http://www.ce.cmu.edu/~gdrj/readings/2006/12/19/Jones_UsingContemporaryArchaeologyAndAppliedAnthropologyToUnderstandFoodLossInAmericanFoodSystem.pdf)

11 <http://realdiapers.org/diaper-facts>

12 Page 9 <http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1334852610766/Chap3.pdf>

## Conclusion:

Responsible consumerism may be an oxymoron to some extent- but it does appear to emerge as an ethical obligation as a challenge to the unbridled consumerism that is currently becoming a global trend and jeopardizing the living conditions of our future generations. The Indian lifestyle as with Asian cultures, traditionally demonstrates a certain frugality characterized by low, demand driven consumption and optimal use of resources rather than wasteful supply driven consumption. We must well assimilate that the ‘problem’ of MSW starts with us; our habits- how and what we consume; before it can concern the ULB. A certain prudence and innovation while adopting new habits could go a long way in reducing the overall generation of SW. It is not difficult to reduce or totally avoid some of the wasteful habits listed above- use a refillable fountain pen, eat fresh food, cloth diapers, avoid bottled water and drinks etc.



Figure 8: Edible cutlery by Bakeys- eat after use and rapidly bio-degrades if thrown.



Figure 9: Upcycling by the creativity of the informal sector. Slippers to toys.

I would like to conclude on an optimistic note by looking at 3 initiatives that redefine the very definition of waste.

1. The recent invention of edible cutlery<sup>13</sup> in India. an excellent illustration of how frugality and design thinking can provide the most unexpected solutions.

2. France courageously eliminates a systemic aberration with a legislation that bans supermarkets and convenience stores from destroying unsold food making it mandatory for it to be given away to charitable missions or community associations<sup>14</sup>.

3. In Africa rubber tyres, slippers and shoe soles that wash-up on the beach are being upcycled into attractive toys for children<sup>15</sup>. This highlights how the informal sector can already creatively and significantly contributing in MSWM. With due recognition and support that capacity can develop to contribute even more significantly.

So ‘Waste is not waste till wasted’. As an idea ‘waste’ is linked to ‘surplus’ and as such relatively new. It does not exist in nature and did not exist for much of human existence. It is definitely possible and advisable for human communities to evolve without generating waste. New thinking about ‘waste’ is required to address the cause itself as the 3 examples above and not considering it as a given to be catered to by increasing the handling capacity as engineering technologist would tend to do. That would undoubtedly be required but we cannot continue to treat the symptoms without addressing the conditions that cause the disease.

13 <http://www.bakeys.com/>

14 <http://www.theguardian.com/world/2015/may/22/france-to-force-big-supermarkets-to-give-away-unsold-food-to-charity>

15 <http://www.deccanchronicle.com/lifestyle/250216/this-firm-in-africa-makes-toys-from-slippers-that-wash-up-on-the-beach.html?gImgId=242707#s>

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