Understanding our civic issues

Solid waste management in Mumbai

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BCPT The Bombay Community Public Trust

Solid Waste Management in Mumbai

Mumbai has a coastal stretch of 603 sq km. Geographically, the city of Mumbai can be divided into three sections, namely, the island city (or main city), the western suburbs and the eastern suburbs. These are also known for administrative purposes as Division I, Division II and Division III, respectively. The total population of the city amounts to nearly 13million that is increasing on a daily basis. Such a huge habitat obviously generates a huge amount of waste of many kinds the management of which is a massive task for the local administration.

Waste Generation

Mumbai generates waste to the tune of approximately 7,025tonnes per day. The waste consists of:

- 5,025tonnes of mixed waste (bio-degradable and recyclable)
- 2,000tonnes of debris and silt.

The biodegradable waste (wet waste) is made up of vegetable and fruit remainders, leaves, spoiled food, eggshells, cotton, etc. Recyclable (dry waste) consists of newspapers, thermocol, plastic, battery cells, wires, iron sheets, glass, etc. Debris includes construction waste, renovation waste, demolition waste, etc. Silt comprises earth and clay from drains and road corners. It is estimated that by 2008 such waste will aggregate 9,000tonnes per day due to increase in the city's population.

Average Generation of Waste by a Citizen of Mumbai

The generation of waste by an individual depends on the socio-economic conditions to which the person belongs. For example, a rich family will generate nearly four to five kg of mixed waste per day; a middle class family will generate between one to three kg of mixed waste per day and a poor family, in slums, will generate close to 500grams per day.

Management of Waste

The Municipal Corporation of Greater Mumbai (MCGM) is formally responsible for the management of waste in the city. The prevailing approach has been one of collection and disposal that is, garbage is collected from communities by the municipal authorities and disposed off at the three main dumping sites that are currently servicing the city.

Garbage collectors employed by various housing societies manually collect the waste generated at the household level and dump it in the garbage bin at specified street corners. There are around 5,800 community bins in the city. In case of South Mumbai, trucks collect garbage from the garbage bins and transport it to a transfer station which is located in Mahalakshmi. A separate transport is arranged for transferring the garbage from Mahalakshmi to the northern part of Mumbai where the dumping grounds are situated. From all other parts of the city, garbage is sent directly to the dumping grounds. Nearly 95% of the waste generated in the city is disposed off in this manner.

This largely manual operation involves 35,000 personnel employed by the MCGM and is collected by a fleet of 800 vehicles, including vehicles hired from private contractors, that work in shifts each day. MCGM spends about Rs15-20lakh per day on collecting and transporting garbage and debris with municipal and private vehicles making about 2,000 trips every day.

The Crisis

Dumping Ground

A dumping ground is, generally, a low-lying, and marshy area, which is located on the outskirts of a city, where there is, usually, no human population. We have, in our city, three dumping grounds which are located in the northern part of Mumbai at Gorai (Borivali), Mulund and Deonar. A fourth one at Chincholi has recently closed down. Amongst the three, Deonar is the largest dumping ground. All the dumping grounds are nearly 30-40km from South Mumbai which explains the huge costs on transportation.
The increase in the population of the city has forced people to settle near the dumping grounds. This has led to the twin problems of people living in unhealthy conditions and protesting for the closure of the dumping grounds, as dumping causes health hazards for the people in the vicinity.

The average life of a dumping ground is 30 years. The remaining life of our largest dumping ground, i.e., Deonar, is only five to six years and, so far, no alternative site has been found for waste disposal. The waste, which offers an incentive after selling like paper, metal, etc., is sold to informal dealers by rag pickers. But the other organic waste, old batteries, polystyrene (thermocol), polythene bags, debris, to name a few, do not have such incentives and these are in huge quantities. Also, since it takes a long time to decompose, when dumped, such waste occupies and fills the low-lying areas. In fact, the search for a new dumping ground starts only when the filling area of the dumping ground is exhausted. Basically, the lower the waste, the longer the life of the dumping ground and vice versa.

The waste at the dumping ground is covered with debris and spread evenly in layers. The organic waste undergoes natural decomposition and generates a fluid, which is known a leachate, and is very harmful to the ecosystem, if not treated properly. The leachate penetrates the soil and, if not prevented, pollutes the ground water. Also, flies, mosquitoes and many other pests breed on the waste and unless properly maintained, the dumps are a public health hazard.

Debris Disposal

In Mumbai, every day 2,000tonnes of debris is generated officially, of which some part goes to the dumping ground for spreading over the organic garbage, as earth is expensive. The remaining debris is spread next to the roads, in the creeks, next to railway tracks and on open grounds. Every day, somewhere or the other, in some building, some renovation takes place, generating debris. This could be of houses or shops; it could be for repair of buildings or demolition of old buildings for reconstruction. To give an example, if the

external surface of a building of 20 floors is repaired, the waste generated would be nearly 200 truckloads which can be used either in filling low-lying areas or for reclamation. Presently, there is no way of monitoring renovations and repairs because it does not need any permissions from authorities. The concerned housing societies give the permissions for the renovations / repairs; hence, no data is available on this. The only regulation, which has been imposed by the Corporation, is that the area where the repairs, renovations and new constructions have happened, needs to be cleaned up from all wastes, after the completion of work.

There are truckers who earn a livelihood by collecting this debris and transporting it for disposal. However, disposing it off properly remains a concern, as there is very little space in Mumbai. It has to be carted over long distances which increases transportation costs so significantly as to make the entire “business” unprofitable. So it is dumped clandestinely in the creeks, thus, destroying our valuable mangroves. As Mumbai has a coastal stretch of 603 sq. km, it has numerous creeks. These are channels of water which occupy marshy land during high tide. The salty water occupies the land during high tide and drains off during low tide. This nurtures plants called mangroves. These plants, in turn, have leaves which provide oxygen to the water for fishes to breed in the creeks. In many areas, like Versova, Gorai, Charkop and Mankhurd, the entire eco-system of the creek has been destroyed as waste is dumped surreptitiously.

Increasing prices of land and more construction activities are forcing the demolition of old structures and building new structures and creating more debris wastes. Debris, being very bulky in nature, requires more space, reducing the life span of the dumping ground. Therefore, municipalities, generally, refuse the entry of debris into dumping grounds other than what they need to cover the garbage. Finding few viable alternatives, people just dump the debris by roadsides. Over time, people start dumping organic waste on top of debris not only compounding the waste disposal problem but also creating a health hazard.

Garbage Collection - Low Serviced Areas

The garbage collection activity itself has several differences amongst the localities; there are highly-serviced areas, medium-serviced areas and very low-serviced areas.

I would like to highlight the low-serviced areas which are the slums; slums are not seen as the rightful recipients of the formal systems of solid waste management (SWM). The local government extends its services only to regularised slums which are declared official or recognised under the census of slums. This step motherly treatment is, in effect, the city's own undoing, since slums form 60% of Mumbai. Moreover, these artificial boundaries can hardly prevent the spread of dirt and disease. A study done by Youth for Unity and Voluntary Action (YUVA) in 1998, covering 100 communities in the slum pocket of Jogeshwari (East), found that while residents were aware of the problems related to inadequate practices of household disposal of waste and systems of collection and transportation of garbage in the community, there was very little community involvement in solving the problem.

Time for Waste To Decompose

When the waste is dumped, it does not decompose very quickly and make way for the other waste. The nature of waste being dumped and the time it takes to decompose, pose a serious threat to the environment as well as human health. Given below are some examples to understand how much time it takes for various materials to decompose.

Vegetables, Fruit Skins, Waste Food	3-4 Weeks
Paper Bags	1 Month
Cloth Bags	5 Months
Wood Pieces	10-15 Years
Leather Shoes and Sandals	40-50 Years
Iron Sheets	50-100 Years
Aluminium Sheets	200-250 Years
Plastic Bags	1 Million Years

Budgetary Allocation

Overall Budget

Budgetary allocation for solid waste management in the city of Mumbai for the year 2003-2004 amounted to Rs453.22crore compared to Rs232.71crore in 1997-1998, an increase of 94%. This constituted 14% of the total budget of the MCGM which stood at Rs3226.52crore. Such a high increase is a reflection of the growing concern for the waste disposal crisis in the city among the local and regional authorities. Costs for maintenance of dumping ground, waste transportation and hire charges come to Rs126crore and constitute nearly 28% of the total budget allocated for SWM.

The budget for schemes, like slum adoption and Advance Locality Management (ALM) comes to Rs5crore, which is 1.1% of the total SWM budget. Nearly 60% of Mumbai's population live in slums which cover 7% of the land area of the city. In the Municipal provisions for SWM, only those slums which are notified and are on municipal or private land are serviced; services to other slums are not accounted for in the budget. The budget allocation for slums forms only 12% of the total SWM budget.

Informal Sector

The total quantity of 7,025tonnes of solid waste, mentioned by the MCGM, is the official figure of waste being collected but the actual generation is much higher. Of the garbage being dumped in the bins, a considerable amount is removed by rag pickers who then sort it out and sell them to those who deal in recyclables like paper, plastics, metal, etc.

This industry is one that is large but informal where the rag pickers provide the recyclables and the transactions run into crores of rupees. This informal industry helps in the reduction of waste being transported to the dumping grounds.

There are people, generally known as kabadiwallas, who collect old newspapers, magazines, metal scrap and other such items and sell them to shops dealing in the same. Besides cash transactions, the deals also involve barter; a popular exchange being garlic against plastic.

Schemes Run by MCGM

Slum Adoption Scheme

It was experienced that because of the heterogeneous population in the slums there is no sense of belongingness and it was realised that an attempt should be made to motivate and involve the slum population by attaching certain incentives to work in cleaning the slums and maintaining hygiene condition. It is in this background that the Slum Adoption Scheme through community-based organisations and public participation has been started by the MCGM.

Initiatives

Advanced Locality Management

Advanced Locality Management (ALM) is local management of solid waste by citizens who organise themselves to manage their waste. Wet waste is segregated at household level and composted locally in any available area, planters, etc., and sweepers or rag pickers take dry waste away. There are in all 643 ALMs along with 276 vermi-compost pits spread over six zones of the MCGM's jurisdiction. This way, approximately 20-25tonnes of garbage per day is prevented from reaching the dump yards. An encouraging fact is that women run 80% of these ALMs. The MCGM has also established vermi-compost projects on its own, one each in the eastern and western suburbs, respectively, to demonstrate to the citizens, the benefits of vermi-culture technology.
The success of any ALM depends entirely upon people's participation. Organisation of the community, training and initiation is done jointly by residents and MCGM, and is initially funded by residents and the Corporation. At later stages, the activities are completely funded by the residents.

Recycling Debris

Debris is recycled to make new construction-related products like bricks, interlocking pavers. City and Industrial Development Corporation (CIDCO) and YUVA, an NGO, have collaborated on this effort to convert the debris and reduce the load on dumping grounds. Presently, the plant in Navi Mumbai converts three tonnes of debris per day. Set up in 1999, this plant is one of its kind in the whole of India and has been successful in developing products conforming to Indian Standard Codes of practice of the Central Government. The plant has successfully completed recycling 1,000 tonnes of debris till date.

ParisarVikas Scheme

Stree Mukti Sanghatana, an NGO, has initiated a scheme which focuses on uplifting the most downtrodden section of the society -the rag picker women and children. This scheme is an ideal solution, since rag pickers together with the ALM system manage the upkeep of their environment. The rag pickers play an important role in managing the solid waste; they retrieve all possible recyclable items from waste and, thus, put these materials back to proper reuse. But, sadly the rag pickers are never recognised for the invaluable service they provide to the city's solid waste management.

Role of the Citizens of Mumbai

The citizens of Mumbai have to be trained in the three 'Rs' with respect to management of wastes.

Reduce

As the budget of the Municipal Corporation indicate, as much as 28% is spent only on transportation of waste. There is an urgent need to reduce the waste by cutting down on transportation. The reduction of waste can happen only when we, as citizens of Mumbai, reduce waste generation in the first place.

Reuse

Simple habits like carrying a cloth bag while going shopping will be helpful to reduce the need for plastic bags. Please do not buy any products in a polythene bag and help the environment as a whole.

Recycle

To recycle, we should segregate our garbage at source. Wet garbage can be recycled by composting or vermi-composting in your backyard or in the vicinity. This will produce good manure that can be used for gardens and lawns. The dry garbage can be given to the rag pickers who sell it to re-users.

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The facts presented and opinions expressed in this booklet are those of the author alone.

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