

## Convert municipal waste to wealth

**Isher Judge Ahluwalia** Posted online: Wed Mar 31 2010, 02:12 hrs

When you visit the beautiful green grounds covering an area close to 48 acres in Gorai, in the western suburbs of Mumbai, by the side of a creek overlooking Asia's largest pagoda, it is hard to imagine that this picturesque location was until recently home to approximately 2.3 million tonnes of garbage in an open dump with an average height of 26 metres, about as high as a five-storey building. The wide green expanse and the revived mangroves have brought about a marked improvement in the quality of life of the residents in the surrounding neighbourhoods.

Before we tell you the Gorai story of rags to riches, let us first get a sense of the urban waste challenge in India. Urban India produces an average of 1,20,000 metric tonnes of garbage daily. With a population of over 12 million, Mumbai alone generates garbage of 6,500 tonnes per day.

Municipalities in India spend between 10 to 50 per cent of their budget on solid waste management (SWM), but most of this is consumed in the salaries of sanitation workers and transport of waste, while a minuscule proportion is spent on its scientific disposal. The abysmal state of affairs with regard to the collection and transport of waste is all too well known. Less understood are the implications of the neglect of waste treatment and disposal, as the garbage lies untreated and unprocessed in open dumpsites, and its grave consequences for public health and the environment.

Not very long ago, nearly 1200 tonnes of garbage was being dumped daily at the open dumping grounds in Gorai. The site had been used for this purpose since 1972, and had become a huge public health hazard. The foul odour emanating from the dump created a situation where residents in the surrounding neighbourhoods could not open their windows. The toxic leachate (the liquid that drains through the garbage) from the waste had led to the degeneration of mangroves in the creek that runs parallel to the dumpsite. A court directive in March 2007 led to the shutting down of the dumpsite.

Thanks to an innovative public-private partnership led by the Municipal Corporation of Greater Mumbai (MCGM), the scientific closure of the dumpsite at Gorai has transformed this waste, accumulated over several decades, into wealth. Sanitary landfills are large and deep underground pits into which the residual waste is put in between scientifically layered geo-textile material and high density polyethylene sheets to ensure complete and airtight closure. The onsite conversion of methane gas is carried out using flaring systems, and the area is developed so as to provide a green cover over the dumpsite.

MCGM earns carbon credits for the capture and combustion of methane (landfill gas) from Gorai, and the transaction is one of the largest carbon advance transactions in the Clean Development Mechanism (CDM). A tonne of methane is equivalent to 21 tonnes of carbon in its global warming potential. The leachate is collected and transported off-site to Versova where the municipal corporation operates a sewerage treatment plant. Gorai is the first dumpsite closure project in India to be registered at the United Nations Framework Convention on Climate Change (UNFCCC). MCGM has already received a carbon advance of Rs. 25 crore against future delivery of carbon credits from the Asian Development Bank, and the total carbon credit earnings are expected to be about Rs 72 crore (higher than the total capital cost of the project). It is estimated to reduce greenhouse gases by 1.2 million tonnes of carbon dioxide over a 10 year crediting period. MCGM is in discussions with a leading energy company to set up a 2 MW power plant at the site to convert the methane to energy, further enhancing the revenue capability of the project.

At Gorai, the project has been completed in 24 months and commissioned in February, 2010 at a total capital cost of Rs

50 crore. After competitive bidding, IL&FS was selected as the project developer and environmental consultants to MCGM and the contract for construction was awarded to a consortium led by United Phosphorus Limited and M/s Van Der Weil Strotgas BV for a period of 15 years. The operations and maintenance of the site will be done by the consortium for a period of 15 years at an agreed cost of Rs. 12 crore.

The project required clearances from multiple authorities of the Government of India and the government of Maharashtra, and has been developed in accordance with the Municipal Solid Waste Rules 2000, which make it mandatory for Urban Local Bodies (ULBs) to collect, transport and process/treat garbage and dispose of the residual in sanitary landfills. The rules have typically been ignored by ULBs in India.

Admittedly, solid waste management in urban India is a much larger challenge than attending to the menace of an over-piled dumpsite, no matter how huge. But while the Gorai scientific closure addresses only the backlog in solid waste management, it sets a great example for what is possible. Gorai is a part of Mumbai's overall Integrated Waste Management Strategy which involves a comprehensive waste disposal plan, developed on a public-private partnership framework as a set of independent but well synchronised projects that covers multiple projects including large landfills at Kanjur (4000 tonnes per day), Deonar (2000 tonnes per day) and Mulund (500 tonnes per day).

Besides carbon credits, the integrated strategy includes projects which generate revenue from sources such as compost, an organic manure prepared by microbial decomposition of organic matter under aerobic conditions; biogas from organic waste which can be used to power electricity generators, construction debris waste which can be used in pavement blocks, etc. While no specific plan was devised for the 150 or so rag-pickers in Gorai, MCGM has built in a social rehabilitation program for the new scientific landfill sites at Kanjur, Deonar and Mulund, with the possibility of using their skills at the material recovery facility.

It was good to hear from R.A. Rajeev, the additional municipal commissioner who oversees the solid waste management for Mumbai, that for the next 25 years, the city does not have to worry about its solid waste management. Mumbai has shown the way. Other cities must follow.

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