

From waste to health

Keeping cities clean is essential for keeping their residents healthy. Our health depends not just on personal hygiene and nutrition, but critically also on how clean we keep our cities and their surroundings. The proliferation of dengue and chikungunya are intimately linked to the deteriorating state of public health conditions in our cities.

The good news is that waste management to keep cities clean is now getting attention through Swachh Bharat Mission. However, much of the attention begins and stops with the brooms and the dustbins, extending at most to the collection and transportation of the mixed waste to some distant or not so distant place, preferably out of sight.

The challenge of processing and treating the different streams of solid waste, and safe disposal of the residuals in scientific landfills, has received much less attention in municipal solid waste management than is warranted from a health perspective. If we do not rise to the occasion to manage the waste that we generate and fail to create clean and healthy cities, we will face many more man-made disasters such as we have seen in recent months in Deonar, Bellandur, and Ghazipur.

One of the problems is that instead of focusing on waste management for health, we have got sidetracked into "waste for energy". In the process, we are opting for financially and environmentally expensive solutions such as incineration plants which are highly capital-intensive. While the National Green Tribunal (NGT) does not allow incineration of mixed waste, nor of any compostables or recyclables, enforcement is a challenge, and the danger to health from toxic emissions looms large.

If only we were to begin by not mixing the biodegradable component of solid waste (close to 60 per cent of the total) in our cities with the dry waste, and use this stream of waste for composting and biomethanation, the management of dry waste would also be made much easier through recycling and processing including by incineration of non-recyclables with appropriate filters to check emissions; scientific landfills will be needed for the little that remains.

City compost from biodegradable waste provides an alternative to farmyard manure (like cowdung) which has been valued from time immemorial for its rich microbial content that helps plants to take up soil nutrients. It provides an opportunity to simultaneously clean up our cities and help improve agricultural productivity and quality of the soil.

India's Green Revolution rescued us from huge dependence on food imports during droughts by using high-yielding varieties of seeds and chemical fertilisers to boost the productivity of food grains. But over time, excessive and imbalanced use of chemical fertilisers has led to severe deterioration in the quality of soil. Organic manure or compost plays a very important role as a supplement to chemical fertilisers in replenishing the nutrient-depleted soils. City compost can be the new player in the field.

Benefits of compost on the farm are well-known. The water holding capacity of the soil which uses compost helps with drought-proofing, and the requirement of less water per crop is a welcome feature for a water-stressed future. Because of good water retention, farmers do not need second or third sowing if rains fail. By making soil porous, use of compost also makes roots stronger and resistant to pests and decay. Farmers using compost therefore need less quantity of pesticides. There is also evidence to suggest that horticulture crops grown with compost have better flavour, size, colour and shelf-life.

City compost has the additional advantage of being weed-free unlike farmyard manure which brings with it the seeds of undigested grasses and requires a substantial additional labour cost for weeding as the crops grow. City compost is also rich in organic carbon, and our soils are short in this. Fortification of soil with organic carbon is an essential element of integrated plant nutrient management as it increases the productivity of other fertilisers. City compost can also be blended with rock phosphate to produce phosphate-rich organic manure.

Chemical fertilisers when used by themselves pollute surface water with nitrogen runoff because only 20 per cent to 50 per cent of the nitrogen in urea is absorbed by plants. The rest runs off into streams and lakes. The addition of compost or organic manure reduces nitrogen wastage, as its humus absorbs the nitrogen and acts like a slow release sponge. The superiority of a system of integrated plant nutrient supply (IPNS), which combines the use of chemical fertilisers with organic manure, was established as far back as 1989 by the Fertiliser Association of India.

Farmers clearly recognise the value of city compost. In most cities, waste transport drivers are bribed by farmers to dump reasonably biodegradable raw garbage onto their fields for making compost onsite for their own farm use. But uncovered and uncomposted raw waste heaps breed rats and insects which carry disease, and attract stray dogs which not only carry rabies but form hunting packs that kill nearby livestock at night. They are also notorious for dog bites and causing traffic accidents by day.

If city waste was composted before making it available to the farmers for applying to the soil, cities would be cleaned up and the fields around them would be much more productive. It would, however, require that delivery mechanisms be set up for the delivery of city compost to farmers.

Recognising the importance of organic manure for the balanced nutrition of crops and restoring soil health, the Supreme Court had directed fertiliser companies in 2006 to co-market compost with chemical fertilisers. However, this direction went largely unheeded. The Solid Waste Management Rules 2016 make the co-marketing of compost mandatory. To provide incentive for co-marketing to the fertiliser companies, in February 2016, the Government of India's Department of Fertilisers notified a policy to promote the use of city compost by offering Market Development Assistance (MDA) of Rs 1,500 per tonne on the purchase and distribution of city compost through the rural outlets of these companies. In 2017, the MDA scheme was extended to compost manufacturers on bagged compost.

The MDA scheme has not worked well because of its administrative complexity and it needs to be simplified. The high volume but low value nature of compost also makes it not so attractive for fertiliser marketing companies to promote its use. While compost manufacturers must meet the quality specifications laid down by the Fertiliser Control Order (FCO), it is equally important for fertiliser companies to make vigorous efforts to market city compost using their well-connected dealer channels and help develop this nascent sector.

It could well be that the companies would rather sell chemical fertiliser which is heavily subsidised. A possible solution in such a situation would be to find a way to make the payment of fertiliser subsidy to the fertiliser companies conditional on the co-marketing of compost. The state agricultural departments can also help facilitate the use of city compost through their widespread extension networks.

Assuming that urban India generates 70 million tonnes of municipal solid waste in a year, and assuming 15 per cent yield of compost, this would provide 10 million tonnes of city compost annually. Quite apart from cleaning up the cities of biodegradable waste, this would be a major and sustainable contribution to improving the health of our soil without further damage by excessive chemical inputs. What a marvelous transition from waste to health.

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