

Municipal Solid Waste Management as an Incentive for City Farming in Pune, India

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The disposal of waste presents an increasing challenge to the administrative bodies of megacities. The Municipal Corporation of the Indian city Pune has introduced source separation systems and on-site organic waste composting. The citizens concerned are looking for practical ways to treat their organic wastes and they have found city farming to be a viable solution.

Pune, situated in Western Maharashtra, India, is a rapidly growing city of about 5 million inhabitants (Kraas & Kroll 2008). The city produces around 900-1100 tonnes of solid waste per day, all of which enters the Corporation's premises. Organic waste amounts to 630 tonnes, corresponding to 65 per cent of the solid waste produced. It is estimated that the largest part of total solid waste (40 per cent) is derived from private households, while the rest comes from hotels and restaurants, shops and markets (see Kroll 2007). Private separation and processing could thus contribute considerably to relieving the centralised disposal infrastructure.

Waste management did not reach the municipal agenda of Indian cities until the second half of the 20th century. The management systems in Pune today are based on the idea of on-site separation. Waste pickers or municipal litter services collect the waste at the households or at central collection points. Some recyclable materials are extracted and the remaining waste is transported to a landfill site outside the city, where, however, only a small part of the biodegradable matter is composted properly (Kroll 2007).

Municipal waste regulations

In the early 1980s several small civil movements began raising awareness about the rising amount of waste in the city. Their ecological concerns occasioned the promotion of organic waste recycling at household level. Adoption of the practice progressed slowly, partly due to the negative connotations of dealing with wastes within the Indian middle class households (Behmanesh 2009). A change was induced by the introduction of the Municipal Solid Wastes (Management and Handling) Rules 2000 (MSW 2000). They included local amendments in Pune that made the disposal of organic waste on residential premises mandatory for housing societies built after 2002 (Kroll 2007). The inhabitants of those

societies now seek acceptable solutions for decomposing their organic waste.

Organic waste recycling and city farming

The Pune Municipal Corporation (PMC) collaborates with the non-governmental organisation "Wealth-from-organic-waste", which emerged from an early ecological civil movement and promotes a viable organic waste recycling technique. The organisation's members have been advertising natural bio-catalysts, or "biosanitiser", developed by the Bhawalkar Ecological Research Institute (BERI) for many years. City residents, mostly housewives, are motivated to use organic waste and the biosanitiser to cultivate organic fruits and vegetables on their rooftops and terraces. The components are simply added to the cultivation beds. The practice is viable for cities because of the micro-scale farming techniques involved, low cost, and lack of unpleasant smells during the decomposition of organic wastes.

The new regulatory framework provided an improved context in which to promote this practice. Citizens in Pune have started to implement city farming at different scales: from herbal kitchen gardens to cultivated terraces of more than 100 m². Local ward officers now cooperate with builders and inhabitants in providing infrastructure for the compost sites on the societies' courtyards and in disseminating know-how on the use of compost in city farming, an orphanage recycles its diaper waste and uses terrace gardens to educate children about nature; prisoners recycle the prison's kitchen waste and grow fruits and vegetables; organic waste is

Cultivation in plastic bags with soil and organic waste
Photos: Sohal Behmanesh



composted in a maternity hospital; and disabled army veterans plant medicinal plants in their residence.

Efficient disposal of garbage seems to be the most significant motivation for users. The access to healthy and fresh food and the ecological benefits seem to be of lesser importance. But, the potential for creating closed nutrition cycles within the city and reducing its ecological footprint by producing fresh organic products on site is underestimated. Lack of awareness is partly to blame, but also the fact that projects involve mainly middle class inhabitants of housing societies.



Rooftop garden in Pune
Photo: Sohal Behmanesh



RoTrees on thin layers of soil in a backyard
Photo: Sohal Behmanesh

Another city farming project, initiated by the PMC with the international NGO International Institute for Energy Conservation (IIEC) envisages the involvement of local environmental NGOs and product suppliers for a broad implementation of rooftop gardens on private, public and commercial buildings.

Bottlenecks and potentials

Pune's municipality has a good basic understanding of different kinds of city farming. The MSW 2000 amendments provided an important incentive for the emergence of city farming using composted organic household wastes. However, the potential for poverty alleviation and chances for broader collaboration in implementing waste-recycling techniques have been neglected. Lower-income households and organic waste recycling are not considered in current city farming project proposals of the Garden Department. The lack of interest in addressing social matters may stem from the Department's limited mandate. The disposal of wastes falls under the mandate of the Health Department, which has no vision regarding developing an eco-city.

Some attempts have been made to implement city farming on informal holdings in Pune, however, the insecurity of land holdings and the densely built infrastructure in slums, where light and space are limiting factors for cultivation, are important obstacles. A project initiated by a local NGO, in which slum dwellers produced and sold manure from organic waste, ended due to a forced eviction from the area (Behmanesh 2009).

So far, no effort has been made to bring together different stakeholders, such as the municipality, NGOs, building societies, slum inhabitants and urban farmers. The Health and Garden departments of the municipality have also not

exchanged information regarding their city farming projects. Important synergy effects could be achieved if the different departments of the municipality integrated their existing city farming approaches. Awareness raising about the potential of a sustainable valorisation of organic wastes in slum communities with insufficient municipal infrastructural facilities is needed. If the vision of transforming Pune into a pilot city of "green roofs" in India (see Behmanesh 2009) progresses, the first step of bringing together environmental and construction stakeholders could be expanded to include a social component. The PMC, as a representative of all of Pune's inhabitants, should then facilitate a more inclusive and holistic approach to city farming.

The future

The Pune Municipal Corporation is slowly adopting the idea of organic waste recycling and city farming and supporting its promotion. One important incentive for urbanites to apply these practices at household level was provided by the MSW 2000 rule amendments. If implementation can be expanded (to other houses and slums), the metropolis will benefit from this closing of nutrient loops, but also from augmented urban biodiversity, decreased water run-off as well as an improved microclimate. Allotment gardening and eco-housing projects using rooftops as garden areas are starting to emerge. An information exchange on innovations of waste-recycling techniques together with these new initiatives could benefit all types of city farming activities and broaden the effects of a decentralised disposal of organic wastes.

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For more information:

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