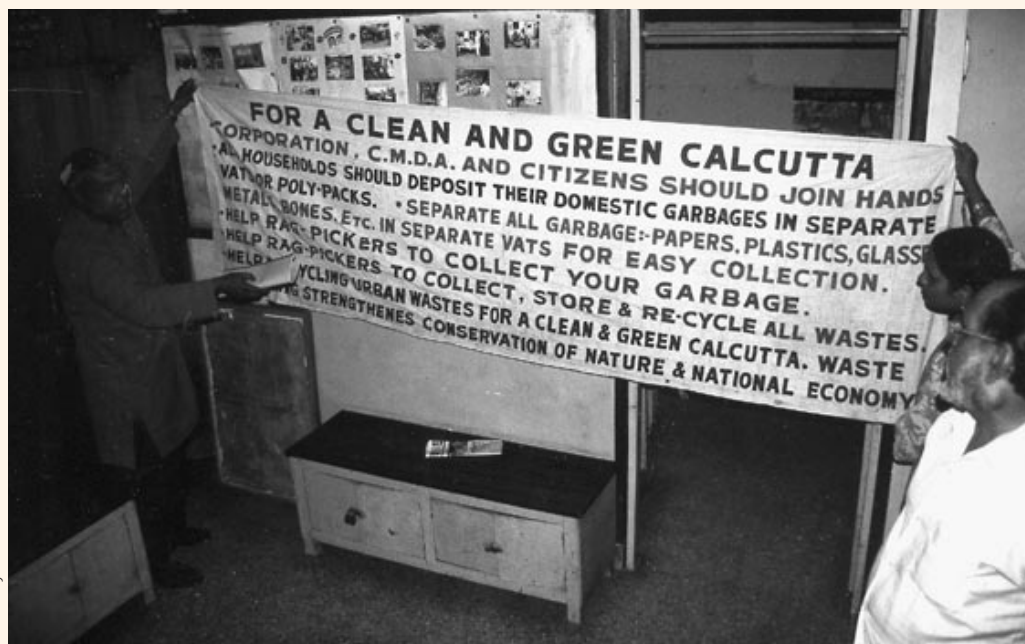


Reducing Health Risks of Urban Organic Solid Waste Use

Whereas health concerns received little attention at the beginning of the thrust to promote urban and periurban agriculture in the past five years, progress has been made in articulating the health issues in developing countries. This paper comments further on one aspect related to the issue of health and urban agriculture: the risks of urban organic solid waste re-use.¹ The focus is the relation of health risk management to informal or community-based practices, which are seen as a major challenge for agriculture in the city. Because the capacity of governments to intervene is currently limited, gradual progress in self-regulation or self-limitation of risks is necessary. International projects and experts can assist in developing appropriate standards, research and practical measures.



A CBO in Calcutta (United Bustee Development Association) promotes source separation of household waste

Obtaining and processing urban organic solid waste for these different purposes involves many actors (see for details Furedy, McLaren & Whitney 1999). Main uses of urban organic solid waste in cities of developing countries are: the application of untreated organic material from mixed municipal wastes directly to soils (e.g. Hyderabad); cultivation on old garbage dumps (e.g. Calcutta, see: Furedy & Chowdhury 1996); the feeding of animals with wastes and waste-derived feed (containing slaughterhouse wastes - an ubiquitous practice, e.g. in Hanoi, see Le 1995); and the composting of organic material in mechanised and small neighbourhood plants (e.g. in Accra, see Asomani-Boateng & Haight 1999).

Christine Furedy
Professor Emerita
York University /
University of Toronto
✉ Furedy@yorku.ca

The principal problems associated with these activities are:

- ❖ survival of pathogenic organisms in residues;
- ❖ zoonoses associated with animal wastes;
- ❖ increase of disease vectors;
- ❖ respiratory problems from dust and gases;
- ❖ injuries from sharp fragments; and
- ❖ contamination of crops from heavy metal take-up and agro-chemical residues via wastes and their leachates.

The concern is not exclusively with human health, as livestock are precious, and sometimes irreplaceable, resources for low-income farmers.

Most of the activities associated with the re-use of organic wastes are informal or semi-formal. The following chart indicates some of the main practices of urban organic waste re-use. The diversity of activities and actors, and their

informal contexts, makes the management of health risks a seemingly overwhelming task.

REDUCTION IN HEALTH RISKS: INTERIM MEASURES

Current limits on regulation

A range of prevention and control measures could potentially ameliorate the diverse risks posed by using urban organic solid waste for food production (see Furedy & Chowdhury 1996). In the developing countries, however, most urban organic waste processing and re-use in urban agriculture is informal or semi-formal, whereas most of the proposed measures entail relatively sophisticated official interventions, new technologies, infrastructure development and re-design of waste management, cultivation and animal-rearing systems. Since there is little immediate prospect of effective intervention in the many informal

activities, we must take what comfort we can from positive trends of 'self-help' in this field, and seek the easiest avenues for introducing information and low-cost technology at the urban and community level.

Self-regulation

There is evidence to suggest that when municipal solid wastes become seriously contaminated with non-decomposable materials and biomedical wastes, the practice of applying solid wastes to farms declines. Reports from periurban farmers who previously applied solid wastes to their fields around cities like Hyderabad, Delhi and Hubli-Dharwad in India indicate that many have discontinued the practice because they cannot attract sufficient agricultural labour, but also because their draft animals are too often injured by glass and syringes (Nunan 2000).

As levels of education rise in the urban population in general, there is also a better understanding of problems of waste management: concepts of waste reduction, separation at source of organics, and composting are no longer unfamiliar and there is more willingness to pay fees for solid waste management (Lardinois & Furedy 1999). It is rare to find a city now that does not have environmental NGOs with some interest in pollution and waste management, and such groups are well positioned to improve public awareness.



Sorting bone wastes in informal fertiliser plant, Kathmandu

C. Furedy

For instance, in the 1960s and 1970s, most of the pickers on Calcutta's municipal garbage dump worked barefooted, while now all, except perhaps young children, wear rubber or plastic sandals (even if picked from the garbage). More waste pickers are seen to cover their noses and mouths with scarves, and to try to protect their hands from cuts. Nevertheless, many of the serious risks cannot be 'seen' by those handling wastes.

Further, people are slow to change their behaviours when their livelihood is at stake and public officials are also concerned about employment. Improving informal work is a slow process of education coupled with providing feasible alternatives.

Setting standards

Suitable standards for assessing health risks are required. International collaboration is required to reaching these standards. One area requiring attention is composting, in particular waste-derived

Farmers stop using contaminated solid wastes

compost. There is considerable interest in promoting composting of urban organics on a 'decentralised' or small scale at community sites. Many international and bilateral agencies have funded pilot projects in urban composting (see Hoornweg et al. 1999).

A weakness is that few if any of the current projects pay attention to public health risks. The rationales of the projects assume that small-scale composting, and composting in general, will be beneficial to public health. Many questions remain unanswered, though. For instance, whether community-based composting increases rodent populations, and sites for vector breeding (although there are anecdotal reports that it may). In theory, well-managed composting should not have these effects, but small composting projects are rarely so orderly.

Most small-scale composting projects do not test their products (or the liquid wastes) for contamination, but if they did, the testing undertaken would likely be limited to tests of heavy metals such as arsenic, cadmium, lead, etc. This is because most tests of compost are derived from Northern standards (and even these vary remarkably, see Blaensdorf & Hoornweg 1997). The inputs for low-tech composting in urban neighbourhoods are more varied than the green wastes composted in most Northern cities, since source separation is not consistently practised. Furthermore, the temperature levels and maturation times necessary to destroy pathogens may not be consistently maintained in small NGO projects. It will be very difficult to monitor the products of scattered community composting undertakings.

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Even in Northern countries, compost standards are being questioned. The Composting Association in the United Kingdom is working towards a voluntary standard for the UK that specifies minimum criteria for "potentially toxic elements, pathogenic micro-organisms and physical contaminants"³. Developing countries that are proposing to set compost standards at all, are for the most part adopting the older heavy-metals-based approach. Some scientists believe it is impractical to develop pathogen standards for compost in developing countries, and that the only feasible approach is to control the composting process (Hoornweg et al. 1999). Even if pathogenic standards cannot be applied, however, further work should be done to develop baseline indicators.

A big question mark hangs over "vermicomposting" because this compost is produced at lower temperatures than in the aerobic process. The recommendations in Europe, that the organic material be digested anaerobically before being put in worm beds, is not done in developing countries. In the municipal compost plant in Buenos Aires, however, worms are used to 'mature' compost, a process that adds two months to the production cycle but which should ensure the safety of the compost (Lardinois & Furedy 1999).

Some general guidelines for safety standards will only be the beginning: local standards must be devised, to take into account the nature of soils, cultivation methods, the crops grown and local culinary habits.⁴

Low-cost options

In the sectors of sanitation and housing, the great strides in service delivery came with more attention to low-cost options in the 1980s. The same approach can be applied in waste management related to urban and periurban agriculture. The subject of low-cost and small-scale amelioration of risk has not been much discussed and there are few examples of actual interventions. Some first steps are suggested here.

An important area for development is the very small-scale wastewater treatment systems able to achieve a standard suitable for irrigating urban plots. In amending agricultural practices, tried and tested procedures for control measures (for example, in crop selection) can be adapted from the work in small-scale wastewater irrigation projects.

Cities that have created sanitary facilities and health services to waste pickers, can extend the same protections to workers handling organic wastes. Community-based projects should ensure facilities and protective clothing, as well as health risk advice, for all staff. Many of the problems of composting units could be reduced if source separated organics could be obtained.

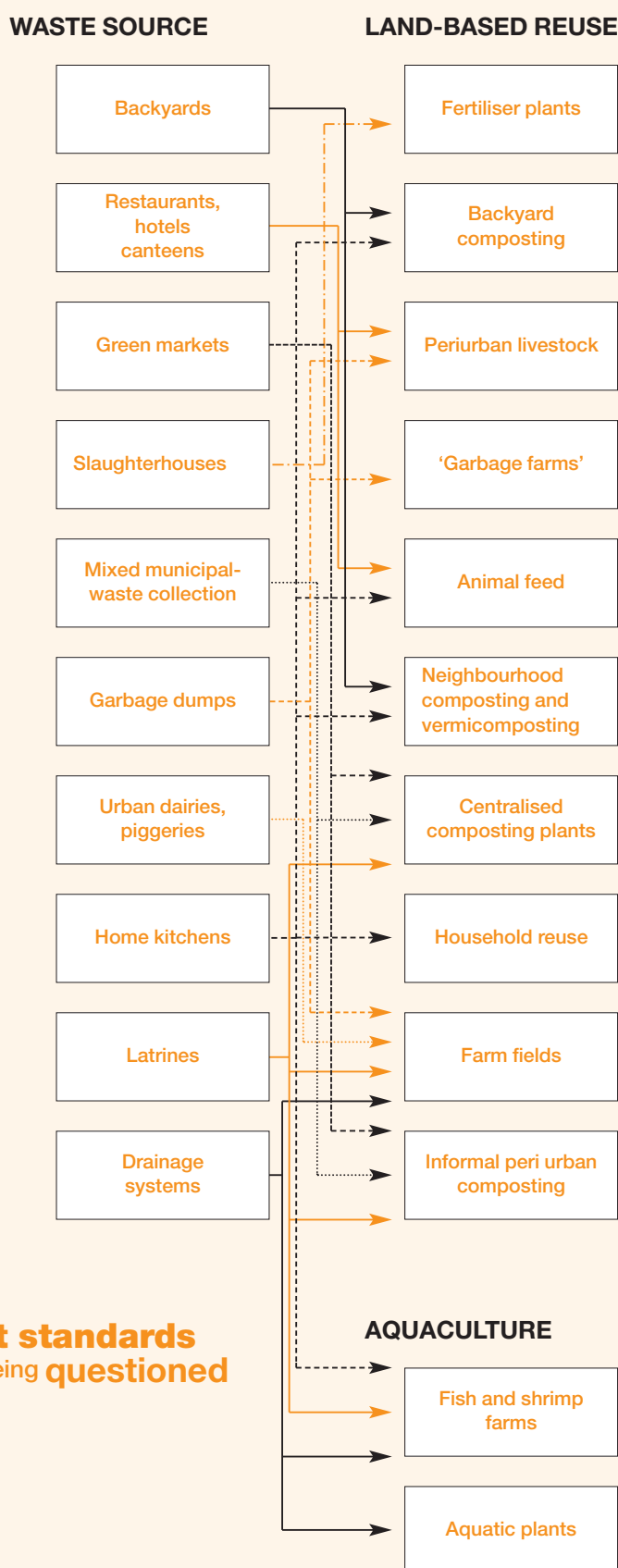
With regard to infrastructure, since the replacement of most garbage dumps with sanitary landfills is not possible, the creation of separate cells at dump sites to receive biomedical and industrial wastes should be a priority wherever 'mining' for organics and waste picking is present (see Nunan 2000). In community-based composting projects, more attention has to be given to the collection and disposal of leachates from decomposition.

Control and monitoring of urban animals, their products and their slaughtering is a gargantuan task for many cities. Much better education of the public and the keepers of animals can pave the way for relocation, regulation and inspection.

CONCLUSION

Realistically, it cannot be expected that a great deal of research will be done on the specific health risks associated with many informal activities in urban food production. Nevertheless, the range of possible risks cannot be ignored, especially when international agencies are strongly promoting urban agriculture. What is needed is an approach that tries to balance risks and benefits. Development itself brings many improvements in public health and greater awareness among the public. In attempting to reduce risks while enhancing food production, cities will have to rely at first on available low-cost options for soil, water, and waste management. International and bilateral projects bear a special responsibility to foster awareness among the public and urban officials; such projects are the easiest way to convey practical understanding at the local level. At the international level, experts can contribute to progress through discussion of appropriate standards for soils, compost and waste management.

Figure 1: Urban organic waste reuse in developing countries.



Compost standards
are being questioned

Source: Adapted from Furedy, Maclaren and Whitney 1999

Notes

1. Human excreta is not included in organic wastes for the purposes of this discussion.
2. It should be noted that far more urban organic solid waste reaches farms via direct delivery by waste collection crews, 'mining' of garbage dumps and the cultivation of old dump sites than from compost plants (Rosenberg & Furedy 1996 pp 72-73, Nunan 2000).
3. See <http://www.recycle.mcmill.com/green.htm>.
4. The point made by H. Shuval, with reference to WHO standards for wastewater re-use, that they are unnecessarily stringent for developing countries, may also apply to standards for soils and compost.