Sustainability Challenges and Solutions at the Base of the Pyramid

BUSINESS, TECHNOLOGY AND THE POOR

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This chapter discusses a range of arrangements and concerns associated with waste management in developing nations. Because the standard arrangements for providing this service are not well known, the chapter includes a good deal of introductory discussion. The first three sections provide general background, discuss the standard form of privatisation and introduce an alternative. It is only in the fourth section that BoP thinking makes its appearance. It provides a framework within which the two apparently antagonistic approaches—standard privatisation and the sustainable alternative—can be combined. The final two sections describe the combination and explain how it addresses past failures and problems. Stepping back from the issue of waste management, the final section also provides a brief general discussion of sustainability in the BoP context.

11.1 Background on solid waste management

Solid waste management refers to the collection, processing (i.e. recycling or composting) and disposal (i.e. incinerating or landfilling) of waste generated by residences and businesses (Zurbrugg 2003). The technology and procedures for solid waste management are well developed and documented (Pitchel 2005). What differs worldwide are the socioeconomic conditions under which waste management takes place.
Solid waste management is primarily an urban issue. As the UN Population Fund (UNFPA) notes in *State of the World Population 2007* (UNFPA 2007), urban growth is likely to occur on an unprecedented rate over the next few decades. Much of this growth will occur in the developing world. Urban areas in the developing world are often unable to provide basic services, including proper waste disposal. The World Bank (2007: 1) describes the resulting situation as follows:

In developing countries, it is common for municipalities to spend 20–50% of their available recurrent budget on solid waste management. Yet, it is also common that 30–60% of the urban solid waste in developing countries is uncollected and less than 50% of the population is served. In some cases, as much as 80% of the collection and transport equipment is out of service, in need of repair or maintenance.

The difficulties noted by the World Bank are due, in large part, to limitations on the available funds. In developed and developing countries alike, funding for waste management in urban areas amounts to roughly 0.5% of gross national product (GNP) per capita. Differences in funding roughly mirror the substantial differences in ‘income’ (i.e. GNP per capita) between developed and developing countries.

Uncollected waste results in a variety of public health hazards (flies and rats, contamination of surface water supplies, etc.). For reasons of public health, most waste management efforts in developing nations focus on collection and disposal, most often by landfillsing (Hoornweg et al. 1999). But landfillsing creates a new problem—the release of methane, a potent greenhouse gas, from the decomposition of organic waste under anaerobic conditions (US EPA 2002). There are moves to improve the collection of landfill methane by increasing the sophistication of landfill design and operation. However, the expense involved in this approach makes it difficult to apply in developing nations (Miller and Clesceri 2003). An alternative is to divert organic materials from land disposal, directing them instead to composting facilities. In this approach, methane generation is avoided and a beneficial product is created.

When considering solid waste management practices in developing countries, impacts on the local economy are of particular importance. These impacts arise because waste-derived materials are an important input to production in many developing countries. Most developing countries have recycling industries. These tend to rely on ‘scavengers’—people who remove materials from the waste stream. The material collected travels from the informal to the formal economy, passing through a series of enterprises (Economist 2007). While the scavengers may earn only a dollar or two a day, those further up the chain can do substantially better. In China for example, a large waste paper company is headed by the country’s wealthiest woman, a self-made billionaire (Barboza 2007).

Recycling activities in developing countries are resource-recovery businesses, not waste management services. While some localities rely on scavengers to manage all or part of their waste stream, the scavengers are not part of a formal waste management system, nor are they paid for the services they provide. Scavenging and other informal-sector waste-related activities are estimated to support a substantial portion—roughly 2%—of the developing-country population (Nas and Jaffe 2004). If one adds in the businesses that depend on the material recovered, the total contribution to economic activity would be considerably higher.
Solid waste management is generally the responsibility of local government, and is often handled directly by local government employees. However, for some time, there has been a trend towards privatisation of government functions in developed and developing countries, including waste management. By 1996, for example, half of all US cities had contracted with firms in the private sector for all or part of their waste management services (Scarlett and Sloan 1996). In developing countries, large corporations are beginning to replace local governments as the providers of waste management services. For example, as a recent survey shows, 23 out of 25 cities in India with a population of one million or more have privatised part or all of their solid waste management services (FICCI 2007).

Multinationals involved in the waste management industry are anxious to participate in the growing market provided by cities in the developing world (Deutsche Bank 2001). However, they find this difficult for two main reasons:

- **Technology.** Some of the solid waste management methods used by multinationals, such as motorised vehicles for collection and capital-intensive composting facilities, often do not work well in developing countries (Coad 1997).

- **Politics.** Experience, primarily with water systems (Lobina and Hall 2007), has created an atmosphere in which multinationals may not be publicly acceptable as the sole providers of essential municipal services in developing countries.

In addition, multinationals often face conflicts with existing waste-based activities and businesses. While these difficulties do not prevent privatisation, they make it harder to implement and less likely to be successful.

To appreciate the extent of the conflicts associated with privatisation, one has only to look at recent 'success stories'—waste management in Egypt’s two largest urban areas, Alexandria and Cairo. As USAID notes on its website, 16,000 local jobs were created by this privatisation effort, along with US$140 million in sales of equipment and materials to US businesses. What USAID fails to mention is the negative impact on the community of 60,000 zaballeen who have traditionally collected, sorted, recycled and disposed of a large fraction of Cairo’s waste. The Christian Science Monitor tells this part of the story (Gauch 2003), explaining that the local government did not renew the licences the zaballeen need to operate. Rather than incorporating their traditional activities into the new solid waste management service, the multinationals providing services in Cairo simply offered the zaballeen jobs in their organisations that paid even less than they had earned previously.

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11.3 A sustainable alternative

In 1998, an approach for providing solid waste management was developed by the Tellus Institute, sponsored by the US EPA (Stutz 1999). Rather than having local governmental authorities or multinationals decide on their own what waste management services should be provided, the Tellus approach begins with input from the community to be served. Services selected on the basis of this input are purchased from the community being served, relying as much as possible on local businesses, including existing recycling activities. Opportunities for developing new businesses such as composting are also provided.

The Tellus approach is labelled sustainable solid waste management (SSWM) because it is sustainable in a number of ways:

- **Socially.** Developing a community base can provide a level of ongoing support that centrally designed and imposed programmes may not enjoy
- **Technologically.** Use of low-tech waste management techniques that draw on local skills reduces the need for substantial, continuing outside support
- **Economically.** Reliance on locally owned businesses strengthens the area's economy
- **Environmentally.** Intensive recycling and composting significantly reduces greenhouse gas emissions

Much of Tellus's work on SSWM focused on greenhouse gas emissions. Tellus analysed the potential impact of enhanced recycling and composting using data for nine developing countries—Argentina, Brazil, Chile, China, India, Indonesia, Mexico, Philippines and Thailand—for the period 1990–2020. Over this period, based on 'business-as-usual' scenarios, waste-related greenhouse gas emissions were projected to nearly quadruple. By implementing enhanced recycling and composting systems, projected emissions could be cut in half. While recycling was important, the key to greenhouse gas emissions reduction was the extensive application of composting. Composting is particularly appropriate for developing countries given the large and growing fraction of organic material in their waste stream (Hoornweg et al. 1999). However, composting is less well established than recycling in the developing world. To date, due to a number of technical and economic factors, most large-scale and many small-scale composting efforts in developing countries have ended in failure (Hoornweg et al. 1999). One of the major problems facing those who favour the SSWM approach is finding a way to create and maintain a high level of composting in developing countries.

There have been efforts to implement arrangements similar to the SSWM approach. These efforts are generally framed as alternatives to the privatisation of waste services by contracting with multinationals (see, for example, SURCO 2000). This framing is unfortunate. Multinationals can supply services that complement those provided locally. These include reliable provision of truck fleets to pick up from transfer points where locally collected waste and residuals from recycling and composting operations are accumulated, and constructing and operating large-scale facilities such as landfills. Multinationals can also provide the managerial and logistical expertise required to integrate the services provided by local businesses into a reliable overall waste management system. Rather than appropriate fashion
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The two arrangements for solid waste management described thus far are, in one key respect, quite similar—both rely on the private sector. Indeed, as a business model, SSWM is simply an alternative form of privatisation which relies on contracting with small, local entities rather than multinationals to provide essential services. Given this basic similarity, it is reasonable to ask whether the two approaches can be brought together in a workable and useful fashion. Drawing on BoP thinking described by C.K. Prahalad (2004), a hybrid is proposed below. However, before turning to that proposal, some general discussion around the BoP concept is needed.

The poor in developing nations represent a massive but often overlooked market. The challenge, which BoP thinking addresses, is how large firms, particularly multinational corporations, can partner successfully to tap that market. BoP efforts have brought large firms, non-governmental organisations (NGOs) and local government together with potential consumers, local small businesses and entrepreneurs in new and creative ways, to profitably provide goods and services to the poor. All three of the key elements of a typical BoP effort—a broad set of participants, new and creative ideas, and profitable provision of goods or services to the poor—turn out to be important in applying BoP thinking to waste management.

The 'new and creative approaches' upon which BoP relies often involve mutually beneficial public-private partnerships. One of the best-known case studies illustrating BoP thinking is that of Hindustan Lever Ltd (see Prahalad 2004: Part II, Section II). This effort drew together public health initiatives with the marketing efforts of a major multinational (SURCO 2000). The innovation is described by Prahalad (2004: 207):

The paradox of diarrhoeal disease is that the solution is known and inexpensive, but it is difficult to reach and educate the poor about the need to wash hands with soap. Hindustan Lever Ltd, the largest soap producer in India, helped create a unique approach to public-private partnership as a solution, and made this public health issue an integral part of its business.

An innovative public-private partnership provides the framework for the BoP solid waste management proposal discussed below.

Before applying BoP thinking to waste management, it is important to ask how, and to what extent, such thinking addresses issues of sustainability. To be successful, BoP efforts require sustainability in the social, technological and economic terms because these are essential if one is to profitably provide goods and services to the poor. Broad participation in BoP efforts is essential. As Prahalad notes (2004: 2):

The opportunities and the BoP cannot be unlocked if large and small firms, governments, civil-society organisations, development agencies and the poor themselves do not work together with a shared agenda.
BoP efforts also require environmental sustainability. Prahalad (2004: 33) writes:

"The poor as a market are five billion strong ... This means that solutions that we develop cannot be based on the same patterns of resource use that we expect to use in developed countries. Solutions must be sustainable and ecologically friendly."

In his '12 Principles of Innovation for BoP Markets', Prahalad includes reducing resource use and recycling wherever possible. While environmental sustainability is not central to most discussions of the BoP, it is clearly part of the overall concept.

11.5 The BoP solid waste management proposal

The BoP solid waste management proposal (the BoP proposal) builds on the standard model for privatisation in which local government contracts with a large firm—often a multinational in the waste management industry—to provide the required waste management services. The difference is that, in the BoP proposal, the multinational would be the head of a team assembled to implement a sustainable approach to waste management, based on input from the local community. Specifically, multinationals who wish to offer BoP solid waste management proposals would need to make the following commitments:

- Create an independent advisory committee representing the local community (residents, local businesses and NGOs) which would participate in the development of a plan for the solid waste management services to be provided
- Integrate existing local solid waste management service providers into the overall plan, including scavengers, community-based collection and street-sweeping efforts, existing recycling activities and new small-scale composting facilities

The BoP proposal brings together a broad set of participants in a way that addresses past failures and problems:

- Limitations and preferences of local government. Government could try to fill the role of 'team leader', but that would require it to duplicate the technical, logistical and managerial expertise that multinationals in the waste management industry already possess. It would also require government to deal directly with the informal sector, something that research in various developing countries shows it is generally not willing to do (Baud et al. 2001)
- Treatment of scavengers. Most developing countries have recycling industries that rely on scavengers who often work under very poor conditions and receive no compensation for their role in waste management. In a BoP proposal, they would become part of the formal economy and would be recognised as solid waste management service providers. Receiving regular income would substantially improve the situation of local recycling businesses and any scav-
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...enders they employ. Entry into the formal economy would allow conditions of work for the scavengers to be more easily and effectively addressed.

- **Failure of composting.** In developing countries, the use of composting is very limited. Attempts to introduce it have often failed. Paying composters for their solid waste management services would improve the economic prospects for composting substantially. In addition, the multinational leading the BoP team could provide the ongoing modest technical assistance and access to capital that World Bank studies (Hoornweg, Thomas and Otten 1999) suggest is needed to make composting successful in developing countries.

- **Resistance to multinationals.** Adopting a community-based, sustainable approach to solid waste management would help multinationals overcome local resistance. In particular it might make contracting with them attractive to community groups and local businesses which might otherwise oppose such a move.

- **Harmonisation of NGO efforts.** There are a number of major NGOs with interests related to waste management: the World Bank focuses on issues of technology and implementation; USAID has a particular interest in privatisation efforts; the World Health Organisation has an interest in relevant public health concerns; and the UN is concerned with many aspects of the issue, particularly sustainable livelihoods for the poor (UN 2006). Because it brings together all of these elements in a coherent package, the BoP proposal provides a framework within which these NGOs and others can coordinate their efforts.

Stepping back from the minutiae, the BoP proposal addresses the crux problem—limited funding. The proposal also relies heavily on local, small-scale, low-tech, labour-intensive methods of collection, recycling and composting. This is likely to help control costs because local labour costs are low in developing countries. In the case of composting and recycling, payments for solid waste management service need not cover the full cost of the services because there is income from the sale of waste-derived products. Finally, fees for waste management are likely to be perceived as more legitimate politically because, to a substantial extent, they fund local businesses. As those familiar with developments in the water industry will immediately recognise, such legitimisation is an important concern.

11.6 Concluding remarks

Building on Tellus's 1998 SSWM proposal with its emphasis on community-based, locally owned waste management services, the hybrid proposed here adds the special talents of multinational corporations, harnessing their drive to expand their markets to provide waste management services in ways that can benefit the poor. Unlike standard practice in privatisation, the BoP proposal does not put local companies out of business. Instead, opportunities for local businesses are actually expanded. Unfortunately, BoP solid waste management currently remains a concept rather than a proven on-the-ground approach.
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We are not aware of any instance in which all the actors in the BoP proposal—local government, businesses and the community, NGOs and multinationals—have come together as described above. One of the objectives of this chapter is to call for such efforts and to provide a blueprint for how they might work. We would be delighted to learn about any such efforts, successful or not, that have taken place to date.

A second objective of the chapter is to highlight the linkage between BoP thinking in general and environmental sustainability. While sustainability is integral to BoP efforts, discussion of its role has been modest. Greater attention is warranted. To illustrate what can be done, this paper has discussed the various relevant aspects of sustainability at some length. This level of discussion would be appropriate for BoP efforts in general. Emphasis on issues such as global warming might initially appear out of place in the discussion of BoP efforts that focus on local problems and solutions appropriate in developing countries. However, local choices often have global ramifications. As the UNFPA (2007: 65) has pointed out, it is essential that those developing solutions to local problems consider this linkage carefully.

11.7 References


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