

Domestic Waste Management in Slums

Rapidly growing cities in developing countries are not in a position to guarantee the satisfactory collection and disposal of refuse. Largely inaccessible, marginal urban areas, often inhabited by the poor, remain without refuse collection.

In developing countries, household refuse is deposited in the streets, drainage canals and rivers or is burned on the spot. Apart from esthetic detriment and stress through foul smells and smoke, these practices lead to enhanced transmission of infectious diseases and the pollution of water, air and soil. SANDEC's solid waste management research is testing new approaches in refuse collection and recycling at the community level. Investigations on existing systems have shown that certain efforts must be made in order to insure the long-term viability of alternative approaches [1]:

- Informing and motivating the population
- Selecting inexpensive, simple technologies
- Coordinating with municipal refuse collection
- Developing organizational and funding structures

Each of these points is clarified below.

Participation

Inhabitants of a city usually know little about the problems of domestic refuse management; therefore, this issue often stands far lower on the list of management priorities than water supply or sewage treatment. Promoting participation primarily means [developing public awareness](#) through information, education and technical support in effecting strategies for improvement. Taking socio-cultural aspects into consideration (i.e., differing cultural, religious and language backgrounds) plays a preeminent role in information campaigns. Gender-specific information is also very important; for example, in Islamic communities, men are the heads of the families, especially in the determination of outside affairs; women, however, play the decisive roles in the household and in issues regarding hygiene.

Appropriate Technologies

The choice of technologies, especially the collection vehicles, has to be adapted to local conditions and match the community's financial situation. Access roads in slums are often narrow and in poor condition. In view of operational and maintenance costs, as well as limited financial resources, locally produced carts drawn by hand often provide a good solution. As salaries in developing countries are low compared to other maintenance costs, recycling approaches (e.g., composting) have to be sought which emphasize manual labor rather than complex infrastructure and complicated machinery.

Coordination with Municipal Refuse Collection

Transfer points, where waste is deposited by community refuse collection schemes and is collected by the next higher level,

usually the municipal collection system, are critical intersection points. Apart from achieving appropriate technical implementation of such transfer points, it is especially important to guarantee good coordination between the various actors involved.

Organizational and Financing Structure

A clear organizational structure should help harmonize the roles of the various players. Financing via taxes must be simple and, above all, transparent. Experience has shown that small- and medium-sized enterprises as well as cooperatives are suitable for domestic waste disposal services at the community level. Their main advantage over volunteer-based community organizations is their business approach.

Implementing Refuse Collection and Recycling

The main objective of a pilot project in a slum in Karachi (Pakistan) was enhancing self-help initiatives to implement such a waste collection scheme. The project was carried out in close collaboration with the local organization "Association for Protec-

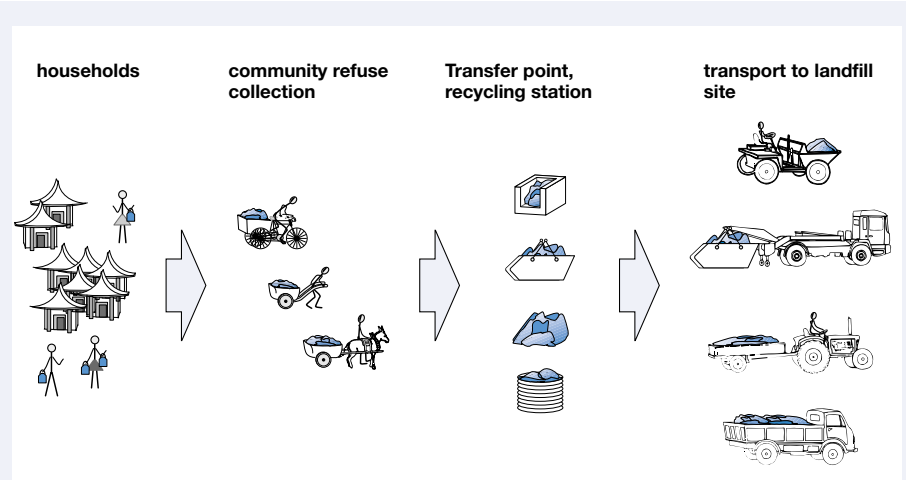


Fig. 1 Model of a more sustainable way to collect refuse, including recycling. Collection by the community consists of simple collection vehicles, a transfer point or recycling station, then the critical intersection with the next level of collection and further transport.



Fig. 2
Refuse collection with the help of wheelbarrows in a slum in Karachi, Pakistan. The technology is adapted to the local conditions as well as the financial situation of the community's inhabitants.

tion of the Environment” and funded by the Swiss Agency for Development and Cooperation (SDC). General information campaigns on urban sanitation and domestic waste were first initiated. The inhabitants' motivation to improve the situation gave the crucial impetus to the collective realization of a refuse collection system (Fig. 2).

Domestic waste management at the level of the community, however, encompasses much more than refuse collection. Minimizing the transfer of refuse to the next higher organizational level (e.g., through recycling) promotes community independence and sustainability of systems. As opposed to

the industrialized countries, **recycling** in developing countries is usually covered by a well-developed informal sector. Here also improvements can be made, especially with regard to biological treatment and re-use of the organic waste fraction, which often amounts to over half of the accumulated refuse. The decentralized treatment of most of the refuse at the community level can significantly reduce costs for transport and deposition. An added benefit is the ecological one; through the re-use of organic material, nutrient cycles can be closed to a large extent and contribute to sustainable resource management.



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[1] Pfammatter R. und Schertenleib R. (1996). Non-Governmental Refuse Collection in Low-Income Urban Areas. Lessons Learned from Selected Schemes in Asia, Africa and Latin America. SANDEC Report No. 1/96, 70 pp. Water and Sanitation in Developing Countries EAWAG/SANDEC, Duebendorf, Switzerland.

The Public Discusses EAWAG's Activities

The Foundation “Science et Cité” promotes constructive confrontation between science and society.

Its purpose is to stimulate new forms of dialogue in which the public and scientific community participate as equal partners. Both sides have the opportunity to share and discuss their experiences, which can be very different in nature and may lead to an entirely new communication culture. Among other things, the Foundation would like to establish “roundtable discussions” as a platform for interactions between the public and representatives of scientific institutions.

EAWAG has agreed to participate in a pilot project for such roundtable discussions. About 10 members of the public and 10 EAWAG representatives will meet two to three times a year to participate in discussions led by a moderator. Scientists will present their activities and plans for future research; they will update the members of the roundtable group on their current projects and discuss how

much progress has been made. The members of the public can then share their perceptions, fears and expectations. The overall goal is to enhance mutual understanding and to learn of new criteria by which research may be judged. Conclusions from these discussions should provide feedback for the development and performance of future research.

The first meeting was held 4–5 February 2000. The Institute for Philosophy and Social Studies of Science at the ETH Zürich will evaluate the project. By participating in these roundtable discussions, EAWAG exposes itself to a critical evaluation of its activities and research directions by members of the public. We are anxious to see how this project develops and what it will bring in the form of concrete results. We will keep you informed!

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