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SUSTAINABILITY OF WATER AND SANITATION SYSTEMS

Community initiatives in solid waste

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OVER RECENT DECADES, one of the commonest characteristics in developing nations has been the disparity between rapid urban population growth and infrastructure provision. The product of this mismatch, described as 'urbanisation without health'¹ is the catalogue of overcrowding, growth in illegal settlements, uncollected household waste, and the absence of water, sanitation and other basic facilities which are typical of many urban centres in Africa, Asia and South America. As a result many millions of the urban poor live in neighbourhoods which are hazardous to health and well-being.

Uncollected or improperly disposed of wastes can serve as breeding grounds for disease vectors, especially vermin, flies and their associated pathogens. Poor management of solid wastes thus presents serious health hazards to all urban inhabitants, but most especially those in low income communities (which suffer most from poor infrastructure provision) and the young (who play on streets or ground earmarked for dumping). The identification of waste management as integral to sustainable urban development is increasingly recognised by the international aid and development community. The United Nations Conference on Environment and Development stressed that '...solid waste production should be minimised, reuse and recycling maximised, environmentally sound waste disposal and treatment promoted and waste service coverage extended'.² UNCHS Habitat emphasises environmentally sound and resource efficient approaches to the problem of growing solid waste quantities, and considers waste management as a crucial component of human policies and programmes.³ What these examples illustrate is the rising importance that solid waste management has amongst advocates of sustainable development.

The nature and operation of solid waste management varies significantly from nation to nation. Distinctions such as these are not limited to the national scale however, and can be seen at the city and neighbourhood level. Regardless of scale, these differences are to some extent attributable to prevailing socio-economic, financial, legal and political variables at that level. There is a clear requirement to reconcile the need for more effective waste management with the constraints that are faced by local municipalities or national governments.

Community involvement, or its absence, is in part both the problem and potential solution of this dilemma. The health hazards faced by many low income urban communities from improper collection and disposal of refuse are

a function of their exclusion from traditional waste management avenues. Factors including illegal status, geographical marginalisation of poor communities, and difficult terrain tend to detach many urban inhabitants from waste management services. However, recent changes in attitude by waste management professionals have placed community initiatives and participation at the heart of sustainable urban development. The main shift in thinking has been twofold: the need to develop local solutions which match local needs and options (often in contrast to professional training); and the identification of neighbourhood refuse collection schemes, based on community participation, as a cheap and effective methods of addressing the solid waste problem.

Community involvement in waste management streams is strongly represented through informal sector activities such as sorting, picking, managing and collecting waste. Recent work by WEDC in low to middle income urban communities in Karachi, Pakistan, reveals the extent of these community's intervention in the provision of primary collection services.

Cases of community involvement

The case studies discussed in this paper demonstrate the potential of community involvement in the planning, operation and implementation of solid waste management. Most of the data and information was collected during 1994-95.

Many urban inhabitants are involved in privately-run recycling systems. The other functions of solid waste management, namely collection, transportation and safe disposal are normally the responsibility of municipal authorities, a responsibility which many are failing to adequately provide.^{4,5} The widespread lack of environmental awareness, little understanding of the health consequences of poor solid waste management practices, and inadequate financial resources all serve to reduce public concern about the impact of poor waste disposal. By contrast, there is increasing attention given to the immediate residential environment, a trend which is particularly visible in middle and high income areas of Karachi, where communities are increasingly co-operating in order to plan and manage the waste management system at the neighbourhood level (typically ranging between 50 to 1000 houses). Common to all of the case studies is that middle and high income area communities share similar objectives, which are:

- A reliable and regular service of waste collection from the residence;
- A system of street sweeping in the neighbourhood;
- Reducing pollution in the neighbourhood through removal of waste transfer points or containers;
- A system for the collection of garden waste and construction debris generated in the area.

In a number of Karachi's neighbourhoods, communities have organised their own waste management systems which satisfy one or more of the above objectives. Although seeking similar goals, organisational patterns and system details vary significantly. Analysis of these case studies may provide a model for other urban communities to manage their own waste collection systems, and for municipalities to incorporate community initiatives into their operations.

Case studies

House to house waste collection in F. B. Area⁶

In this example, residents were consulted about the possible introduction of a house to house waste collection system in their neighbourhood, and asked to comment on the plan, which included details and costings for the scheme. In total, 1000 letters were sent to houses situated in blocks 10 and 11 of the area, and 90 per cent of residents voted in favour of adopting the system. Two second hand Suzuki pick-up trucks were purchased and a door-to-door collection system was started. The collection system is based on pick-up trucks (capacity 500 kg) which cover a predetermined route. Collection crews stop at various points along the lanes to load waste from bins before moving to the next house. When the pick-up truck is full the collected waste is disposed of at a central point, from where the municipal vehicles collect the waste for final disposal. Under the system, each house was charged a monthly fee of Rs 25 over the first four years, rising to Rs 30 per month during the last two years.⁷ All operation and maintenance costs are paid from the collected revenue. Additional income is raised through the resale of separated waste such as glass, plastic and metal. Although initially operated under the auspices of a municipal councillor, dissolution of local authorities in 1989 meant that the collection system has since run as an independent enterprise.

Evaluation by WEDC in early 1994 showed that the system worked effectively: the community contributed a regular amount for waste collection, the system was self financing, and significant gains had been made in the provision of a reliable and regular waste collection service. The main constraints that were identified included disruption to the formal collection system forcing municipal sweepers to move to other, more profitable areas, lack of will to support and replicate the programmes elsewhere in the municipality and irregular operation of the pick-up trucks. Despite these problems, the system con-

tinues to operate and is currently collecting waste from 800 houses daily.

Karachi Administration Women Welfare Society (KAWWS)⁸

The KAWWS is a group of housewives from a higher middle-income neighbourhood of Karachi, known as Baloch Colony.⁹ The area is characterised by a number of yet undeveloped open plots, which have become *de facto* a site for household waste disposal. In 1988, KAWWS formed a group with the objective of collecting money to purchase waste collection bins, which would help address the problem of improper disposal on open plots. KAWWS charge a monthly fee of Rs 100 from each participating housewife. Although in this scheme bins were purchased for the neighbourhood, the collection and disposal of the waste remained a problem, there was no formal agreement between the municipal corporation and KAWWS to collect waste from the transfer points. KAWWS subsequently negotiated with the municipal refuse vehicle driver in the area to arrange for waste collection for a set fee.

The arrangement worked well, and in 1994 KAWWS received funding from UNICEF in Pakistan to establish a revolving fund to provide additional waste bins in the area. Following consultation with local shopkeepers and other residents, bins have been placed at appropriate sites in the neighbourhood. Evaluation by WEDC in 1994 showed that the programme had substantially improved cleanliness in the area. The main constraints included low levels of participation (restricted to about 50 housewives), residents' perception of the initiative as a service delivery programme (many residents prefer a cleaner environment and a regular service for waste collection, but few are interested in contributing their time in arranging the systems); increasing housing density has made the siting of bins a long term problem; and the municipal sweeper system has been disturbed with workers moving to other profitable areas. Despite these constraints, KAWWS is still active in the area and has expanded its work into other environmental improvement projects such as tree plantation, park development, etc.

Organised waste collection by C. P. Berar Society¹⁰

This is a relatively new programme (late 1994) initiated by a long-established association, *Anjuman e Falah o Bahood* (Welfare Association). Funding (Rs 35,000) for proper management of solid waste in the area was received from UNICEF, and was used to buy tools, equipment, training and education materials. The cost of operating the collection system was born from the community. Phase I of the programme involved waste collection from 1000 houses. Wheelbarrows and shovels were used by the municipal sweepers, who collected waste from the houses and swept the streets. The community has organised itself into groups of 20 households, each with a volunteer to monitor the system for that grouping. For every five volunteers there

is a group leader. The community association maintains links between the group leaders and volunteers.

Further detailed investigations are required before conclusions can be drawn from the programmes' experiences. Preliminary evaluations conducted in May 1995 indicate that the programme has not disturbed the existing municipal system, and sweepers continue to work in the area. The community association has developed a healthy relationship with municipality supervisory staff which helps improve the efficiency of the existing arrangement. This is an interesting model of community participation, in which community involvement is limited to the role of watchdog.

Street sweeping and waste collection in Gulshan e Iqbal, block 7¹¹

Waste collection in this higher middle income area is organised through an informal group of housewives known as *Falahi Tanzeem*. The group charges monthly fees of Rs 100 per house, Rs 500 per month from established schools and Rs 250 per month from newer schools. Contributions are collected by a staff member specifically appointed for this task. The association also employs 8 sweepers, five of whom are seconded from the municipal authority. The association's revenue is divided between the seconded and employed workers. The sweepers use their wheelbarrows to carry waste to municipal containers which are approximately 2 kms distance from the neighbourhood. Further investigations are planned to establish how the desire for a cleaner environment balances with willingness to pay and the perceived (low) priority of waste management services in many parts of Karachi.

Analysis of the case studies

Opportunities and constraints

There are several points which can be raised from the case studies described:

- It is clear from the programmes that there are dedicated activists within the community who 'own' the initiatives and direct and guide its operation. Does this diminish the notion of community involvement? Although being derived from individual(s), the ideas do not remain their sole provenance, with the community typically initiating, and taking charge of improvements as and when they occur.
- The problems of urban areas in developing countries are typically distinct but similar. Community initiatives, if properly understood and fully incorporated into the municipal system have potential to improve system efficiencies and reduce expenditures. Community groups in higher and middle income areas have shown their ability to solve the problems of street sweeping, household waste collection and the trans-

fer of wastes to central collection points within walking distances in the neighbourhood.

- Although municipal authorities can focus their attention on the development of appropriate transfer points, improving waste transportation and development of disposal sites, many fail to encourage community efforts, instead typically planning for privatisation, without understanding the social and economic consequences of this intervention. Pre-qualification Notices published in Karachi's daily newspapers in April 1995 illustrate the top-down nature of this intervention: although experience is one of the requisite criteria asked of firms, the notice does not mention the type of work involved or the areas in which it will be carried out. Community groups are effectively excluded through the narrow interpretation of Pre qualification criteria.
- Another crucial point drawn from the case studies is that of enterprise development in waste management. Case study 1 is a good example of a community based enterprise, in contrast to the other examples where sweepers or collection crews are paid a fee to operate the system. Community groups, municipal authorities and donor agencies should focus their attention on developing grass root enterprises for waste collection and street sweeping. The community groups can establish a contract with such an enterprise, monitor its activities, negotiate rates and educate the community. Payment for the service may be direct from the household in the case of household waste collection and through the association for street sweeping. Municipal authorities can play an enabling role by placing the sweepers and making them directly accountable to the community groups. Case study 4 closely mimics this arrangement.

Encouraging community initiatives

Municipal authorities can take the following steps to encourage popular participation in the waste management process:

1. Publicise in local newspapers that those groups willing to assist municipal authorities improve environmental conditions in their area should come forward to the relevant municipality office (or administrator).
2. The municipal authority transfers sweepers to the representative community organisation. Sweeper attendance should be verified jointly by an area supervisor and a community organisation representative.
3. The community group can decide and plan their own internal system of waste collection from houses to the transfer points (*katchra kundi*), street sweeping and collection of garden waste and construction debris.

3. The community group decides the rate and frequency of additional payments made to the sweepers. This may be from a centralised money collection, or a decentralised system in which residents pay directly for waste collection while the association pays for street sweeping and collection of garden waste etc.
4. The community group provides and maintains all necessary tools and other safety equipment for the sweepers.
5. The community group should check that municipal sweepers are not involved in work other than that for which they are paid.
6. Collected waste should be brought to a single point decided mutually by the municipal authority and the community. One collection point should serve at least 500 houses and a system should be devised by which the municipal authority ensures a timely and regular collection of waste from the transfer point. One way of doing this is a ticket system, in which a certain number of tickets are given to the community group which are redeemed by the driver following collection.

From transfer point to the disposal site, the waste management should be the responsibility of municipal authority or their designated contractors. Thus, Karachi Municipal Corporation can utilise the appropriate methods for all these tasks.

Summary

Although describing the experiences of middle-upper income urban communities in Karachi, these case studies illustrate the potential that exists for closer integration of the community with solid waste management practices, as a way of stretching scarce resources, to improve the health and well-being of urban inhabitants and to encourage grassroots enterprise development.

References

- ¹ Hardoy, J.E., Cairncross, S., & Satterthwaite, D. (1990) *The Poor Die Young* Earthscan Publications, London.
- ² Quarrie, J. (Ed) (1992) *Earth Summit '92: The United Nations Conference on Environment and Development*, Rio de Janeiro, 1992. Regency Press Corporation, London.
- ³ UNCHS Habitat Improving the Living Environment for a Sustainable Future United Nations Centre for Human Settlements HS/270/92 E. UNCHS (Habitat), Nairobi, Kenya.
- ⁴ Shenk, H., and Baud, I., (1994) *Solid waste management in Bangalore: reflections, assessments and suggestions*. In *Solid Waste Management: Modes, Assessments, Appraisals and Linkages in Bangalore*. Manosher Publishers, New Delhi, India.
- ⁵ Lardinois, I., and Van de Klundert A., (1993) *Organic Waste: Options for Small Scale Resource Recovery. Technology Transfer for Development & WASTE Consultants*, Amsterdam, The Netherlands.
- ⁶ For details contact Mr Pirzada M. Rafi, B-218, Block 11, F.B. Area, Karachi, Pakistan.
- ⁷ 1 US\$ = Rs 31. The average family income per month in the area is Rs 8,000 - 10,000, and average plot size is 400 sq yards.
- ⁸ For details contact Ms Sara Siddiqui, C-32 Block 2, Karachi Administration Employees Co-operative Housing Society, Karachi - 75350.
- ⁹ This area is among higher middle income groups in which 64 per cent of households have an income level greater than Rs 5,000 per month, against average incomes in planned areas of Karachi of Rs 4,930 per month (Applied Economic Research Centre, University of Karachi, 1988).
- ¹⁰ For details contact Mr Shafi ullah Khan, House No. 70, Block 7/8, C.P. Berar Housing Society, Karachi.
- ¹¹ For details contact Ms Nishat Zafar, 183-D, Block 7, Gulshan -e-Iqbal, Karachi.