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**Noman Ahmed**
Professor, Department of Architecture and Planning, NED University of Engineering and Technology, Karachi, Pakistan

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# Sustainable community waste collection in Karachi, Pakistan

N. Ahmed PhD

**Low-income communities residing in squatter settlements usually develop their own services through self-help efforts. Such schemes include solid waste disposal, with the aim of placing household and other kinds of waste outside the locality from where it can be removed by municipal authorities. This minimalist system ensures cleanliness and basic upkeep in the community area. The system normally utilises a sweeper and basic waste-collection tools such as a wheelbarrow improvised for waste collection, hand tools and collection bins used by households for routine collection. A community mobilisation effort is required for the efficient working of such a system. In two low-income communities in Karachi, this approach was applied by a local non-government organisation (NGO), the Association for Protection of Environment (APE), in 1996. After providing continuous professional support for three years with the objective of acting as a catalyst, APE trained several members of the local community-based organisation (CBO) to manage and run the project on an independent basis. This paper provides an account of the approach and the system that evolved from it. After withdrawal of the NGO in 2000, the project has been working successfully under the supervision of the local CBO and area youth. This paper presents the lessons learned from the process of empowering communities to develop their own internal service systems. It addresses the issues that are vital in ensuring the sustainability of such attempts in urban lower-income localities.**

## 1. INTRODUCTION

Experience has shown that the technical merit of solid waste management projects in low-income communities becomes effective when supported by social mobilisation and consequent cooperation of recipients. Many researchers agree that conventional formats of service provision are not appropriate to low-income communities[1,2] but the input of non-government organisations (NGOs) acting as catalysts for change has proved useful.[3] As NGOs have a greater capacity to deal with the complex social, economic, political and cultural issues of poorer communities, their input is deemed useful for overall improvement in these contexts.

In the cities and towns of developing countries, many projects and initiatives have been launched over the past decade that have attempted to improve solid waste management at neighbourhood level. Baromtrilokanat 21 from Phitsanulok municipality in Thailand provides a useful example. This initiative was launched in the late 1990s when some 81 households came together and formed a community organisation. Based on the principle of self-help and willingness to pay, the community group formulated a waste management project for their area to include treatment of organic waste, recycling/reusing appropriate materials from the waste, dumping relatively low-value waste for municipal collection and evolving an effective strategy for dissemination. The project ran successfully for several years.[4] Many worthwhile community-based solid waste management examples in India have also been documented, with a sizable majority showing positive results. For instance, in Bangalore, the Urban Waste Expertise Programme (UWEP) launched an integrated solid waste management project based on the participation of local households. About 35 schemes were launched, each stretching out to an average of 300 households. Among other learning factors, the project demonstrated that NGO support was instrumental in raising the working capacity of community-based groups.[5] A study focused on Khulna City, Bangladesh revealed that formal/informal education and training had a positive impact on residents with respect to their participation and willingness to pay for the service.[6] A rich repository of literature on community-based solid waste management projects is available via the internet[7,8]. Formulation of the projects in Karachi described here under review was also based on this expanded body of knowledge.

## 2. BACKGROUND TO SOLID WASTE MANAGEMENT IN KARACHI

Karachi is Pakistan's largest city, with a population of over 15 million and its only port, located on the country's southern coast (Figure 1)[9]. Various agencies have been responsible for different stages and localities regarding solid waste management. According to the recently established local government set-up that came into effect from 2001, Karachi is governed by a city district government headed by a Mayor or Nazim. Among other assigned functions, it manages the two landfill sites in the city. For devolving functions, responsibilities and revenue collection privileges, the city is divided into 18 areas governed by town municipal administrations (TMAs). The TMAs are responsible for taking solid waste from designated points (secondary collection sites) to landfills. Each town is further administratively divided into 178 union councils, which supervise sweepers and ensure the transportation of solid waste to the secondary collection sites. Apart from the

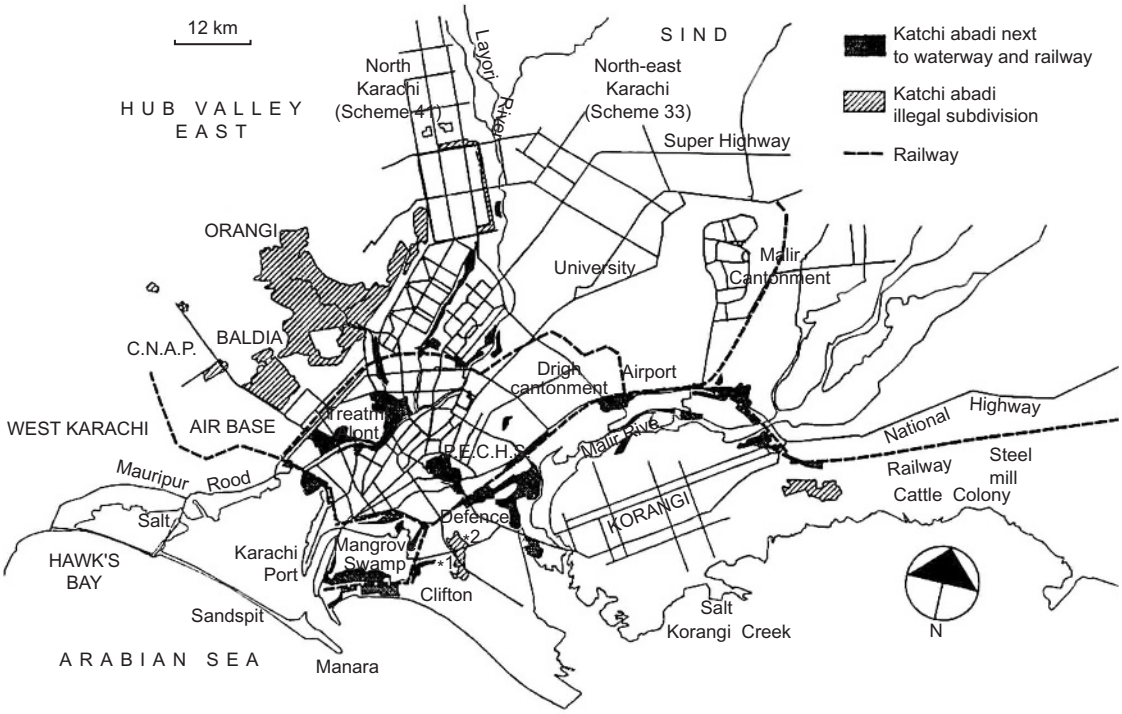


Figure 1. Map of Karachi showing squatter settlement (katchi abadi) locations: 1, Shah Rasool Colony; 2, Lower Gizri

above-mentioned areas, there are 22 other localities that are managed by different government, semi-government and autonomous agencies such as solid waste management cantonment boards.

Surveys conducted for *Karachi Strategic Development Plan 2020*[10] indicate that users regard the solid waste management system as inadequate. Around 40% of the waste generated is removed via municipal transportation. No scientific study has been carried out by the municipality to arrive at accurate figures for generated or removed waste and neither the government nor other actors have made a concerted effort towards waste reduction. A few innovative ideas for transporting waste to dumping sites have been trialled. For example, the transportation of waste by train to an out-of-town site was started in 1997 but abandoned after only a few days. The City District Government Karachi (CDGK) attempted to privatise some solid waste management services in a few locations in 2005, with unsuccessful results. CDGK has decided to privatise the entire range of solid waste management services and, in January 2008, a Chinese firm was awarded the contract worth Rs 3·5 billion (≈US$58 million) annually.[11]

| | Waste: t/day |
|---|---|
| Separated by households | 1000 |
| Separated by waste pickers | 900 |
| Used as fuel for kilns and various similar enterprises | 400 |
| Used for land reclamation | 400 |
| Lifted by CDGK | 3300 |
| Not picked up (mostly dumped in natural drains and water bodies) | 2000 |
| Total | 8000 |

Table 1. Solid waste collection and disposal in Karachi[10]

Waste composition and quantity in Karachi varies by income group and season. It is estimated that the city generates about 8000 t of household waste every day,[10] with the average per capita waste generation estimated to be 1·8–2·0 kg/day.[12] Per capita waste generation in squatter settlements (katchi abadis) was estimated at 0·224–0·371 kg/day,[13] but more recent studies[10] indicate that this figure has increased to 0·8 kg/day. At source, saleable waste items are separated by housewives and sold to itinerary waste buyers who frequently visit residential localities. Local sweepers dump collected waste at local dumping points. Waste pickers sort this waste and separate recyclable materials including paper, metals, glass and plastics. Rubble and debris is dumped in private construction sites where landfilling/reclamation material is needed. This arrangement is worked out after mutual agreement between the owner of the site and the municipal staff concerned. In addition, a sizable quantity (2000 t/day) of refuse is dumped in natural drains and/or water bodies by sweepers and municipal staff. This waste is not removed (Table 1[10]).

Among the various stages of solid waste management, disposal from household to the local/street bin is arranged privately through a sweeper (see Figure 2[14]). This situation is valid for almost all income groups. Normally, municipal sweepers (who are assigned the duty of area cleanliness by the municipality) obtain informal contracts from individual households to collect waste from domestic bins and dump it in street bins/locality heaps. This is then removed by municipal waste collection vehicles and scavengers/recyclers. This service functions on mutually agreed terms with concerned parties drawing advantages: households obtain a reasonable waste removal service while sweepers receive income. However, work on routine cleanliness of streets, lanes and public spaces is often neglected. On special occasions, sweepers arrange for other related services such as street cleaning, removal of debris and coordination of the removal of waste from street bins/heaps to

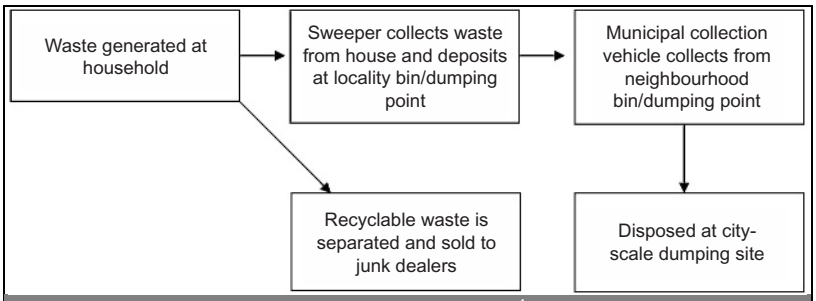

Figure 2. Solid waste management cycle in Karachi[4]

a dumping site. They thus get paid twice for the same assignment.

Residential areas of Karachi comprise a complex combination of planned and unplanned neighbourhoods; there are more than 702 squatter settlements of various sizes within the city limits.[10] These settlements have varying levels of access to basic urban services including solid waste disposal. The city administration does not assign any priority of services provision. It is generally assumed that since a large number of residents in squatter settlements do not pay any taxes, they are not entitled to receive any service. However, this view is only marginally valid. Residents in settlements where rights of tenure are yet to be decided do not pay government taxes, but they do pay for each and every service through informal means. Municipal officers also assume that waste generation is negligible in these low-income settlements. Middle- and upper-income settlements receive a higher priority due to overall political influence and clout in urban affairs. For these reasons, the municipality assigns a low priority to squatter settlements for waste collection. However, squatters located at the edge of high- or middle-income areas have to grapple with rising solid waste quantities. The upward mobility of residents in traditional squatters is on the rise and consumerist practices are spreading, leading to an increasing generation of solid waste. Such factors make it all the more important to undertake waste collection and disposal projects on a priority basis. Solid waste management cantonment boards, which were initially related to military settlements, have slowly evolved into urban management institutions along with the growth of the city. As is the case elsewhere, squatters have also emerged at the periphery of such areas. The cantonment boards provide municipal services to their residents in the same manner as the CDGK does in the rest of the city. The removal of solid waste is one of their assigned tasks.

About half of the city's residents dwell in these unplanned, unserviced locations that have periodically evolved over the last 60 years due to various social, economic and political reasons. Shah Rasool Colony and Lower Gizri, in south Karachi, are two such settlements.

## 3. PRIMARY WASTE COLLECTION PROJECTS IN SHAH RASOOL COLONY AND LOWER GIZRI

### 3.1. Background

An assessment based on survey data found that squatter settlements that acquire piped water supply and sewerage then intend to obtain a waste management service.[15] As self-help becomes a strong propelling force for acquisition of urban basic services in such areas, waste management could also be facilitated through a project designed and derived from this approach. Willing participation of the local community is a vital consideration. However, waste collection schemes normally require initial support for the basic organisation, facilitation and implementation through appropriately designed projects. A review of non-governmental primary waste collection schemes initiated or maintained by community motivation and/or involvement in medium and small enterprises revealed that they are promising approaches for service coverage in low-income urban areas.[16] However, many shortcomings were observed, including lack of appropriate information and motivation of community members, inadequate financial set-up for the schemes and difficulties regarding technical aspects.

### 3.2. Project planning and objectives

On the basis of lessons learned from self-help experiences in low-income settlements, an idea for a local waste management project evolved. The pilot project was by initiated the Association for Protection of Environment (APE), an NGO focused on waste management and environmental issues, and the Department of Water Sanitation in Developing Countries (SANDEC) at the Swiss Federal Institute for Environmental Science and Technology (EAWAG). At the start, the project aimed to select an appropriate area in the city, assess the situation within the area and investigate community attitude towards refuse collection and disposal. Field studies suggested several prerequisites for the area choice: low-income settlement, limited population scale, well-defined limits, availability of water and sewerage services, potential of obtaining legal titles (by households), inadequate waste management service, absence of input in waste management and general willingness of area leaders to cooperate with the project team were some basic considerations.[17] The investigation into area choice began in February 1996 and ended in December 1996. The next stage (January–December 1997) aimed to field test an approach for informing and motivating the community and implementing the improved programme. The third and final phase covered final evaluation of the conducted improvement programme and an assessment of any shortcomings and failures of the project and its methodology. This phase was completed in 1998–99.

The objectives of the project included

(*a*) gathering people's concerns about waste collection/disposal
(*b*) testing an approach based on community involvement
(*c*) developing a suitable alternative for waste management.

### 3.3. Locality characteristics

Shah Rasool Colony (SRC) was the first locality selected for the project. A set of surveys was carried out to reveal the overall area profile. SRC is located in block 4 of Clifton, Karachi (Figure 1). It covers an area of 3·7 ha acres, with a population of about 3000 people residing in over 400 housing units. The area was first inhabited in 1956 and was illegally occupied by the servants of armed forces personnel residing in the vicinity. Over time, the housing area has expanded without consideration to roads, services and amenities. No other NGO/actor had attempted solid waste management in the area. The area is one of the settlements suitable for regularisation, with waste collection considered necessary. SRC has an ethnic and religious mix of people including Pathans, Punjabis, Mohajirs, Sindhis and Christians.

APE conducted a physical reconnaissance survey of the area and updated land-use information. The survey revealed that 65% of the area was residential, 2% residential/commercial, 10% amenity plots, 10% roads and streets and 13% open land. A survey of infrastructure and facilities showed that piped water supply was available in the area though it was often deficient. Sanitary latrines, individual electric and gas connections were available to the majority of households. The sewerage system consisted of open drains and pipe sewers. Internal roads and streets were unpaved, but approach roads were comparatively better and public transport was available.[13]

A survey concerning waste collection and disposal revealed that 85% of households utilised some sort of waste container. Some 77% of households did not use services for waste collection but disposed of waste themselves. Waste was mostly indiscriminately dumped and burnt. Two communal bins were located in the area but not properly utilised and secondary collection from the municipality was non-existent. Insects and rodents were prevalent and incidence of disease was high.

Community meetings, surveys and focus group discussions were carried out for different ethnic and target groups separately. They revealed that an overwhelming majority of respondents regarded waste collection and disposal as a problem and that the problem lay both at street/community level and household level. Due to increased pollution, choking of sewers and open drains, increases in diseases and proliferation of insects and rodents, 82% of respondents wanted a better primary waste collection system; 72% were willing to contribute financially and 28% wanted to participate physically.[13]

With this information, the project team considered it viable to sensitise the community about the importance of waste management and its impact on daily life and wellbeing. The strategy adopted for this purpose was based on short and clear messages highlighting personal responsibilities/obligations, defining the role of the municipality (including potential/limitations), informing on duties/responsibilities pertinent to liaison with the municipality and teaching the advantages of cleanliness and its relationship to health. In the course of fieldwork, different categories of influentials in the area were found; they included informal leaders, prayer leaders in the mosque, prominent women in the community, local government functionaries and political activists. The majority were found to be very receptive and agreed to cooperate in the wider dissemination of messages related to waste management to respective spheres of influence.

Community members also decided to appoint community volunteers. The criteria of choice were devised by the community and were based on willingness towards volunteer work, ability to spare time and basic motivation towards the project. The volunteers, both male and female, were trained by APE on basic aspects and concepts of waste management. Different target groups of the community were informed and educated on waste management issues through unconventional communication modes. Apart from displays of promotion material, the APE team informally discussed the project with the community in restaurants, parks and playgrounds. Female APE staff visited women in the afternoons after their routine household chores.

The community was involved in all phases of the improvement project including assessment of the existing situation and designing, implementing and evaluating the system. The technological, management, institutional and financial aspects were guided by APE. The procedures of the scheme were designed and finalised by the implementation committee and implemented gradually in the area. They highlighted the importance of using appropriate waste containers at household level, avoiding plastic bags, keeping back lanes clean, avoiding littering on streets, utilising the services of private sweepers and establishing a methodology for waste management. The implementation committee also established the financial and institutional set-up of the scheme.

A local community-based organisation (CBO), which consisted of female volunteers with time to devote to community activities, was activated by community members. APE provided training to two volunteers per lane. These volunteers organised the collection of refuse from households (female volunteers having greater access to the womenfolk of the community who were responsible for storing and disposing domestic waste) and liaised with sweepers. APE also provided personal protection gear and technical assistance to sweepers. As decided by the CBO, at the start of the project each household contributed Rs15 (US$0·25) per month for the sweeper services – that is, collection of household refuse and street sweeping; this has now been increased to Rs30 per month (US$0·5). After setting up the scheme and imparting training, APE has completely withdrawn. The project started in the middle of 1997 and has been running successfully without interruption to date (Figures 3–5).

### 3.4. Replication in Lower Gizri

Community groups from adjoining localities visited SRC to observe the workings of the waste collection project; they also had several informal meetings with the local community members who had helped initiate the project and were in charge of its operation. Community group members from Lower Gizri were inspired by the work at SRC and requested APE to provide technical assistance and management guidelines.

In order to ascertain the willingness of residents and to obtain insight into household characteristics, APE conducted a socio-economic survey of Lower Gizri in June 1999. Among other aspects, APE collected information on the existing system of waste collection in the locality, expenditure incurred and level

Figure 3. Collection of waste from a household

of satisfaction. Fifty households were contacted out of a settlement comprising around 700 households. It was found that 10% of households had contracted waste disposal through a sweeper, though on an irregular basis. Some 90% of the surveyed households had no organised means of waste disposal; these residents burned refuse at street corners, threw it outside their homes, occasionally disposed of it on an external pit/street or buried it in the ground.[18] Eighty-eight per cent of households did not spend any money on waste disposal; the remaining 12% spent a maximum of Rs25 (US$0·45) per month. The study found that the majority of households were not satisfied with the existing situation and that 86% were willing to pay for waste disposal.

At this stage, community members were given an introduction to the primary waste disposal project in SRC using slides and transparencies comprising photographic messages and related information. Thereafter they were taken to SRC in two groups of 25 to observe the workings of the project; they were encouraged to question the implementation committee and sweepers in the area to obtain first-hand insight. The majority (86%) of community representatives agreed to adopt the same method in Lower Gizri

Figure 4. Waste collection at a dumping point

Figure 5. Municipal vehicle collecting refuse from Shah Rasool Colony

and suggested that local youths undertake launching and management of the project. The APE team was then formally asked to provide technical and management advice.

On the basis of information gathered during the area survey and awareness created among different cross-sections of the community, the APE team assisted the community in identifying various options for the collection and storage of waste inside houses (Table 2). The chosen option was recycled tin containers (from oil or other edibles). APE suggested painting the tins with anti-corrosion paint to increase life span and for aesthetics. After conducting a survey of the scrap market from where the containers were to be purchased, the local group collected money from each participating household and purchased the containers in bulk to obtain a price concession. The containers were painted and then handed over to households. Each household paid Rs60 (US$1) for a bin; sweeper services were acquired for the collection of waste on the basis of a monthly payment of Rs25 (US$0·45) per household. Sweepers were instructed to leave collected waste at a dumping/collection point on a main street outside the locality from where a designated vehicle would pick up the waste. Sweeper performance was monitored by a local youth group who were given short training in the management and monitoring of waste management activities. The basic equipment needed to run the project (two one-wheel trolleys, personal protection gear for sweepers and common tools) was provided by APE.

The project was launched in 1999 and involved 150 households. Two sweepers were hired for collection of waste, street sweeping and occasional cleaning of manholes. They began work very enthusiastically and in only a few weeks overall cleanliness was greatly improved. Households residing in adjoining lanes also became interested in the project. They contacted the local group and, after internal discussions, the decision was taken to include a further 50 households in the scheme. As Lower Gizri is a contiguous settlement, the local volunteers and APE continued to expand the project by gradually adding new lanes/households. By 2006, about 550 households were made a part of the

| Storage option | Remarks |
|---|---|
| Wooden container (e.g. fruit crate) | Very cheap/minimum cost<br>Unsuitable for storing organic/kitchen/ wet waste<br>Short life |
| Plastic bag | Minimum cost<br>Difficult for wet waste storage<br>Difficult to manage and hold |
| Tin container | Very reasonable price<br>Suitable for wet waste<br>Easy to handle and clean |

Table 2. In-house waste storage options

regular scheme monitored by the CBO. The project continues to operate successfully and many adjoining locations have also followed the example under their own initiative.

## 4. SUSTAINABILITY ISSUES

Sustainability is a very broad term with varied interpretations. In this project, sustainability is taken to mean continuity of the project under the local CBO with negligible or no support from APE. These aspects were deemed vital to ensure self-management of the initiative.

### 4.1. Recognition of the importance of waste disposal

A community's perception about waste disposal is an important factor in respect of the sustainability of waste management projects. In places where the community is fully conversant with the dangers of a polluted environment, the possibility of success increases. This usually occurs in low-income settlements that have some kind of link with a middle- or high-income area with some degree of cleanliness. It is also vital that community members possess a background of urban living and are able to appreciate healthy initiatives and the requirements of a safe waste disposal system.

The studies that led to the creation of the project in SRC revealed that the residents there had been living in urban areas for a considerable period. Interviews and contacts with community members indicated that they were familiar with the concept and practice of waste disposal. However, this familiarity was limited to observations of middle- and high-income households of their employers or acquaintances. Personal experience was very limited and this factor indicated potential for the initiation of the project.

### 4.2. Strategy of the project

The project was started using very simple methods to inform, educate and motivate people about waste disposal. As mentioned earlier, informal community meetings were held with community residents at popular venues such as tea houses, mosques and nearby public parks. Messages about the importance of cleanliness and ways and means of ensuring a healthy and clean environment were disseminated. Female APE social activists sought an understanding of the waste generation process in houses, the aspirations of women residents towards a cleaner environment and their willingness to participate in a project. Very basic technical aids such as posters, charts and photographic materials were used to acquaint the women with the fundamentals of health and hygiene in relation to waste disposal. With both women and men generally convinced to participate, the possibilities of success of the project increased.

### 4.3. A compatible and easy-to-apply solution

The approach to the project was based on adoption of a set of procedures that were easy to apply and were socially and economically acceptable to community residents. For instance, domestic waste collection containers were purchased after consultation with the community. Several options were considered. A new plastic bucket of sufficient size was found to cost Rs150 (≈US$2·5). Although plastic is a durable material that does not naturally decompose, it was rejected by community members because of their perception that new containers should only be used for 'better' purposes such as bathing and cleaning. An inferior-grade object was desirable for the storage of refuse and thus the option of second-hand containers evolved.

Similarly, contrary to the views of some visiting experts about having a well-constructed secondary disposal bin, the community felt more comfortable with the use of rubbish heaps. When the project started and area refuse was regularly removed from the secondary collection point, community residents invited the concerned municipal officer to view the whole process. At that time they also requested the construction of a secondary bin at the site of the heap; the municipality agreed after persuasion from the local residents. The community was thus able to make progress at 'no cost' through lobbying and utilising public pressure. The manoeuvrability and efficiency of sweepers was increased through the provision of mono-wheel trolleys, and sweepers used their own initiative in increasing volumes of waste carried through the use of second-hand plywood sheets (Figure 3).

### 4.4. Cost-effectiveness and affordability

The whole project was planned to keep it within affordable limits – a one-off expenditure of Rs60 (US$1) for the purchase of waste bins and Rs25/month per household for the service charge. Apart from collecting waste from houses, the sweeper also swept the lanes and the public open spaces in the locality. The improved cleanliness reduced the incidence of disease and the community was convinced that expenditure on the waste project was far less than even one medical consultation.

### 4.5. Location

Proximity to an affluent settlement had several advantages that both SRC and Lower Gizri enjoyed. The pick-up of waste from secondary bins was relatively easy as municipal vehicles make more regular collections in more prosperous areas and such localities provide an example of proper upkeep, maintenance and organised waste disposal.

### 4.6. Link up with the area disposal system

It was found that disposal of waste from secondary bins was a vital component of the project, especially with respect to people's perceptions. The cantonment board (the concerned municipal service authority for the locality) was contacted. Initially, a response was not forthcoming but after reviewing the performance of the project and community views, the board agreed to lift waste from the secondary bin free of charge twice a week. The system worked well for some weeks until a vehicle driver started skipping the bin. The matter was reported to a

municipal officer who re-advised the driver to stick to the stipulated duty. However, the collection lapses did not end. At this stage, the local group consulted with the APE team who advised direct dialogue with the driver. The community representative decided to provide a cash incentive to the driver. After brief negotiation, it was agreed that representatives of the local group would pay the driver Rs50 for each trip to the area. This payment came from an additional household contribution of Rs5 per month, an amount that every household willingly agreed to pay.

### 4.7. Professional guidance

The guidance of APE was catalytical in the creation and performance of the project, but the overall execution and management role was undertaken by local groups. Matters of project planning, development of options, preparation of information/motivation campaigns were undertaken with APE's guidance – and only at a stage when community residents had agreed to participate. In matters such as choice of equipment and its modification, APE's advice was useful since it was based upon the knowledge and experience of various professionals. APE also provided management assistance in approaching the municipal authorities. The preparation of project documentation, surveys, contacts within the community, record keeping, correspondence with municipal authorities and developing presentations for promotion of the work in other households in the locality was undertaken with APE's technical assistance.

In this process, many people – especially the youth of the area – were trained in various tasks. Such training and experience not only helped them in the waste disposal project but also in daily life. For instance, two volunteers who ran a small store were able to access micro-credit support from a government programme; this was only possible due to their acquired skills in effective correspondence, documentation and presentation.

In order to demonstrate the effect of such projects, a clearly defined communication strategy is needed. This task can be performed by an external actor such as APE or any similar NGO with experience in waste management. As the scope of work dealt with by the CBOs is confined to their respective localities, the message has not been spread to other katchi abadis (squatter settlements) in an effective manner. Furthermore, replication requires basic input by external advisory actors such as APE. As the project at the formal level did not involve targeted replication, extension to other katchi abadis has not yet taken place.

## 5. CONCLUSIONS

If examined from the perspective of sustainability, the two pilot projects described can be regarded as sustainable with reference to the devised scope and contextual limitations. Technical input can play a very useful catalytical role when provided in an appropriate institutional format. One lesson for experts and practitioners is that a correct assessment of the potential of communities must be undertaken as a prerequisite to designing and implementing a service delivery mechanism. This simple lesson is applicable and relevant in many contexts in Pakistan and elsewhere in the world where similar challenges are faced. The fact that the project has been working for the past eight years indicates the capacity of area youth to deal with evolving issues entirely on a self-help basis. The realisation of internal potential regarding the ability to properly diagnose and develop quick-fix solutions is the other outcome of this modest initiative.

It is obvious that the solid waste management project at SRC is no new invention. It is an appropriate application of technical know-how with a corresponding understanding of the sociology and economics of low-income settlements. A positive indicator is that the project has been working satisfactorily since its implementation. Its working success, however, is conditional to several factors discussed in the issues related to sustainability. Waste disposal projects can function in areas where either the residents are already aware of the significance of waste disposal as a way towards a healthy lifestyle or can be made aware through an information campaign. It also works in areas where there is some kind of sewerage system/disposal in place – residents in areas where sewerage disposal is not available do not give priority to solid waste disposal.

In residential locations, participation of the entire household is essential. The process of informing, educating and motivating residents brings other positive results. Demonstration of a functioning system and its outcome also leads to the involvement of otherwise unoccupied/non-participating members and especially women.

Community residents adapt well to familiar and easy-to-apply solutions. If such options are made available, the possibility of success increases. However, both familiarity and simplicity of application are related to each context and need to be viewed for every community/area specifically. Solutions that are affordable are likely to generate positive results. In the case of the two projects described in this paper, area residents paid for the service and did so quite happily as they could gauge the corresponding results.

Waste disposal projects cannot survive in isolation. The removal of waste by municipal service providers from secondary locations is essential to make the community effort sustainable. Project sites must thus have proper accessibility in terms of roads/streets.

Appropriate technical advice is also essential in making such projects successful. Nascent enthusiasm alone does not generate positive results. Lack of awareness/understanding about the field and know-how about pertinent problems remain a handicap. Good results are obtained when technical and managerial guidance is provided in a catalytical manner – that is, support organisations should provide guidance while preparing community groups to act for them. It is evident from these case studies that APE and the communities were clear about project ownership. APE limited its role to that of a catalyst and emphasised that the community needed to acquire ownership of the project. Therefore when the active tenure of involvement was concluded, the community was in a position to manage on its own. This was a vital factor that led to self-reliance and the capacity development of local CBOs. If NGOs maintain a clear position about their support pertinent to technical and managerial input, project sustainability is greatly enhanced.

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