Cash for Trash: Solving Dhaka's Waste Problems

Ashoka Fellows Iftekhar Enayetullah and Maqsood Sinha

In early 1994, two young Urban Planners completing their graduate studies approached a government official in the Dhaka City Corporation (DCC) with their concerns about the growing problem of solid waste in their city. They outlined their ideas for solving the problem, which included getting communities involved in composting their organic waste. The pair even offered to donate their time to the municipal body and to other government agencies to make this a reality. Unconvinced, the official challenged them saying, "If community-based compost plants are such a great idea why don't you do it yourselves?"

Rising to the challenge, Iftekhar Enayetullah and Maqsood Sinha set about doing exactly this. The following year they established Waste Concern, an NGO dealing specifically with solid waste management. Waste Concern envisioned a strategy for zone-wise waste management through a network of decentralised composting plants, and the establishment of successful partnerships not just with government but with the private sector. Through facilitating innovative arrangements between different levels of government, the private sector and local communities, Waste Concern has succeeded in developing a community-based solid waste management model for Dhaka which many other cities in Bangladesh and in other developing countries are seeking to emulate. With its emphasis on recycling and resource recovery, this model has improved not only the urban environment but also the quality of lives of poor people living in slums. Waste Concern's success remains tenuous however, as government agencies in Dhaka continue to be attracted by large, expensive, mechanised projects to deal with the growing problem of solid waste.

In February 2000. Waste Concern organised a regional seminar on community-based solid waste management in Dhaka. More than 100 participants from India, Pakistan, Nepal, Sri Lanka, the Philippines, Thailand, Switzerland, USA and Bangladesh gathered to share their experiences of community-based solid waste management in the Asian region, and to develop workable strategies for scaling-up community-based initiatives. The conference highlighted the many challenges in achieving real policy reform in the waste management sector such as the need for alterations to municipal ordinances and the provision of adequate funding for nascent community-based or micro-enterprise initiatives. Conference participants, however, expressed optimism that city governments in the region would, in the near future, frame suitable strategies and modify the necessary by-laws to accommodate the inclusion of NGO's and CBO's into the mainstream of solid waste management - thus providing the enabling environment necessary for scaling up community-based projects.

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Background

Urban solid waste management is one of the most immediate and serious environmental problems confronting municipalities in developing Asian countries. Municipal authorities lack the resources to deal effectively with the growing amount of solid waste generated by expanding cities and, as a result, much of this waste finds its way onto roads and into open drains causing serious health risks.

Dhaka, the capital of Bangladesh, is one of the most densely inhabited cities in the world with a population of over 10 million in an area of only 360km2. Its population is growing at six percent annually as rural migrants surge into the city, placing an added burden on an already overloaded system. Over three million people live in slums and receive no municipal sanitation services. The city generates about 5,800 tons of solid waste each day, at least 80% of which is organic and suitable for composting. That's about 1200 truckloads in total. Around half of this garbage is not collected by the cash-strapped city corporation, and is left to rot in the heat and humidity of the city's open spaces. The resulting stench, rodents, and clogged drains pose a serious health risk to Dhaka's residents.

It is estimated that 55% of Dhaka's population lives below the poverty line; many people scrape together a living by collecting waste. These people play an important role in reducing the city's waste by at least 15%. But whilst waste pickers sift through the garbage for saleable items such as glass and plastic, the economic potential of the organic waste remained untapped until Iftekhar and Maqsood persuaded Dhaka's residents that all their waste is a resource.

The Approach

Waste Concern aimed to transform the culture of waste management in Dhaka by introducing the concept of the 4 R's: Reduction, Reuse, Recycling, and Recovery. A poor country like Bangladesh, they argued, cannot afford to see waste as a problem. "We have to look at waste as a resource," says Maqsood, "And we believe it is very easy for Bangladeshis to do this. Our culture says we don't throw things away easily."

Waste Concern sought to improve urban environmental sanitation through a model for solid waste management with an emphasis on recycling, resource recovery, and public-private-community partnerships. Establishing a network of community-based composting plants, which would convert household organic waste into bio-fertilizer, was the linchpin of their strategy. These plants would create job opportunities for the neglected poor, especially women, by involving them in recycling activities.

In order to do this, residents needed to be convinced that there was something in it for them. Iftekhar and Maqsood know that it is meaningless to urge people living in slums to keep a clean environment when they don't have enough food on the table. "It would be utterly na&#65533;ve," they argued, "To advise slum residents on safe waste disposal when even their basic food needs are hard to come by." To gain acceptance from slum dwellers, they added a built-in monetary incentive. Iftekhar explains, "We had to develop a system that would create income opportunities, as well as take into account the space constraints of the settlements."

Piloting the Idea

"In the beginning," explains Maqsood, "It was very difficult to get people interested in working with waste or even giving us the space to set up a processing site." For Iftekhar and Maqsood, a successful pilot project was an important step in gaining both the slum dwellers cooperation and government support.

In 1995, Waste Concern started a pilot composting plant in Mirpur, Dhaka on land donated by the Lions Club. In Mirpur they were able to demonstrate that each family could turn its kitchen scraps into a nutrient rich product, which they could then sell to Waste Concern. Making use of the existing network of waste pickers and of simple technology, Waste Concern was able to demonstrate the benefits of a community-based approach.

Says slum resident Rustom Ali Sheikh, "A few years back Waste Concern approached us and invited us to their office. There they explained in detail how to use drums to create sampad (resources) from moila (waste). Waste Concern workers monitor the program. We also motivate other residents to throw their kitchen waste in the drums. The group that collects the most waste gets a prize. Previously it was difficult to live in the slum because of the smell. There was also high prevalence of diarrhoea and cholera, particularly during the summer. Slum residents would spend a significant portion of their earnings for medical treatment. Disease and illness is part of bosti (slum) life. Now the slum is much cleaner and illnesses have significantly reduced. As a result, residents are more aware and cooperative. Even if Waste Concern leaves this area, we will continue the program. We will keep our environment clean so that we do not fall ill. We will go to the municipality and ask them to build a dustbin near the slum."

The success of the Mirpur pilot project convinced all stakeholders, including the government, that the model was workable. The Ministry of the Environment and Forestry under their Sustainable Environmental Management Programme (SEMP) requested that Waste Concern replicate their model in other neighbourhoods. In 1998, with the support of UNDP, Waste Concern did so in four other poor communities around the capital. Support from SEMP, however, did not automatically solve the biggest problem with replicating the model: access to land. In the last decade, the price of land in Dhaka skyrocketed and authorities became wary of letting public land fall into the hands of private individuals or organisations. It took Maqsood and Iftekhar five years to convince government agencies to back their community-based projects and to enter into the first ever municipal-private partnership in waste management in Dhaka City. Key to their success was not only the technology used but also the innovative arrangements put in place to assuage the city's worries over land usage.

The Technology

At the household level, Waste Concern borrowed a technique found in middle and high-income households in Sri Lanka, where barrels that require very little room are used to produce garden compost. They adapted the system to better suit Bangladesh's climate and established a scheme in which every four to six houses in a slum share a barrel for composting kitchen waste.

Waste Concern now employs about 120 former waste pickers who collect organic household waste from local households using small, bicycle driven collection carts. The waste is then transported to

community processing centres and transformed into compost over a period of 55 days. This top quality compost can be sold for up to $50 for a 50kg bag.

Before they begin a new neighbourhood compost plant, Iftekhar and Maqsood conduct surveys to see how residents feel about solid waste management and whether they would be willing to participate. In all the surveys they conducted, the majority of residents were unhappy with the existing municipal programme and were keen to seek alternatives. Although encouraged by the results of the first survey, the pair realised that nobody was eager to have a garbage dump right next door to their living quarters. Given the proximity of these sites to neighbourhoods, it was important to situate them in a way that would control unpleasant odours. They also had to demonstrate that what they proposed was no ordinary dump, but a productive source of income.

Researching composting methods exhaustively, they narrowed down their technical options to two systems - the Chinese Pile and the Indonesian Windrow. The Indonesian technique controlled the stench better, so they adapted the size and shape of the aerators to suit their purpose. In this technique, raw waste is piled up with 4-5 perforated bamboo poles stuck into it to provide aeration. Waste is also periodically turned. Proposing a simple but effective technology to control stench proved to be a perfect beginning. "But for the technology," says Maqsood, "The neighborhood associations would have barred us from siting the compost plants in residential areas."

With the right technology in place, they were able to start working with the people. Learning through posters and interactive training sessions, resident associations were quick to embrace the new idea: separate trash at the source, provide organic waste for composting, and generate employment opportunities for the poor, in that order. Training was an individualized affair; field workers visited each household to discuss waste segregation and composting. Community monitoring of each neighbourhood's project is achieved through the establishment of a local 'Green Force' which acts as a watchdog for environment and solid waste related activities.

Financially, this approach has proven its worth in augmenting household incomes. The yearly income is about Tk1200 per barrel (1US$=Tk50); this is shared between the participating households. Slum residents have also benefited through employment opportunities provided by the community-based composting plants. Waste Concern provides former waste pickers with better-paid and more hygienic jobs. Rokeya Begum has worked at the original plant for over 4 years and has found her life turned around. She now earns a salary of Tk950 per month and contributes to half of the family's income. This has given her a say in family matters which she did not have before. Says Rokeya, "Dhaka City is very insecure and everything is uncertain. I did not want to work in the garment factories, or in homes, as the hours are very long. I have to look after my children, cook, clean the home and also take care of my mother-in-law, who sometimes comes to visit. Working at Waste Concern is allowing us to plan for the future. We intend to save some money and buy land in our home district and eventually move back."

A Wider Impact

To generate revenue for their community-based composting plants, Maqsood and Iftekhar arranged for fertilizer companies and small nurseries to purchase compost-based bio-fertilizer produced by the plant. In doing so, Maqsood and Iftekhar have hit two birds with one stone. Waste Concern's work not only meets the need for efficient and environmentally sound ways to manage refuse but also, the organic manure produced is a tonic for which Bangladeshi soil is gasping.

Bangladesh is a deltaic country, and, as such, "Needs to enrich its soils with organic matter if it hopes to hold water and reduce the impact of excess water to any extent," argues Haroon Rashid, a World Bank consultant. During the Green Revolution of the 1970s, excessive use of chemical fertilizers depleted the soils of organic nutrients and topsoil in many parts of rural Bangladesh, which caused drastic reductions in crop production. Organic matter is now estimated at less than one percent, whilst the critical level necessary is 3 percent. In an attempt to meet previous production levels, farmers scatter an estimated 3 million tonnes of chemical fertilizers every year, further breaking down the natural ecology of the soil. Before Waste Concern developed its product, there was no organic alternative to chemical fertilizers on the local market. Organic manure from compost is a lot cheaper than any form of inorganic fertiliser. Waste Concern sells its compost at Tk 2.5 a kilogram to the fertiliser marketing company, which in turn sells it to farmers at Tk 7 (1USD=Tk 50).

The Bangladesh Agricultural Research Institute (BARI) has conducted research into the use of organic compost on potato crops and found that using organic compost could increase the yield by 50% with a 30% reduction in the use of chemical fertilizers. Says Shahidul Islam, the Director General of BARI, "You will not solve all the problems of our soil with organic compost alone, but it could be a big part of the solution."

Initially, Waste Concern wanted the Ministry of Agriculture to become the main bulk purchaser of the organic compost since it has the largest marketing and distribution networks. But although the ministry promotes the use of organic compost, it has not taken on this role. Instead, an agreement between Waste Concern, two private companies, and a leading NGO has made the marketing and sale of organic compost throughout Bangladesh possible. Compost made in Waste Concerns plants is now used in many parts of Bangladesh. One of the companies, Alpha Agro, is selling 200 tons of compost a year and estimates that the demand will increase to 15,000 tons over the next few years. Says Maqsood, "If community participation is the key to creating compost in the first place, selling it through a marketing network holds the key to sustainability."

Partnerships

After the initial donation of land by the Lions Club, Waste Concern battled to find land for their other neighbourhood plants. Private landowners were unwilling to provide land and government officials claimed that no land was available and, even if it were, the agencies that controlled the land would be reluctant to provide access for fear of private encroachment on public property.

Undeterred, Maqsood and Iftekhar conducted an independent study that surveyed and identified a sufficient number of government-owned and vacant lands within the municipality. After five years of demonstrable success, and continued lobbying of government agencies, Waste Concern finally convinced the DCC and the Public Works Department to provide government land for an expansion of their community-based composting plants.

On 13th August 2000, Waste Concern entered into the first ever private-municipal partnership in waste management in Dhaka City. It established a community-based resource recovery project at Dholpur in Dhaka. Under the agreement, land for the project was provided by DCC along with the necessary infrastructure like water, electricity, and fencing. The DCC also provided staff from the conservancy department for the project. Funding was provided by UNDP under the Sustainable Environment Management Program of Government, whilst Waste Concern provided the necessary technical advice

and training to DCC for project implementation. It was stipulated that after one year of necessary training on operation and maintenance of the composting plant, Waste Concern would hand over the plant to DCC. With government agencies retaining control of the land and the project and Waste Concern acting as the implementing agency, the agreement allayed fears of private encroachment on public land.

Gaining Ground

From a humble beginning with a one-ton capacity unit in Mirpur, Waste Concern is close to treating 200 tons of garbage a day at six different locations in and around Dhaka. Iftekhar and Maqsood, both Ashoka Fellows, have gained international recognition for their successes. They have received not only the United Nations Race Against Poverty Award but also the Fast Company's first ever Fast 50 award for social innovation. Media coverage of these awards has played an important role in popularising their concept of community-based compost plants.

Based on the evidence gathered so far by Waste Concern's pilot project, it appears that this type of micro-enterprise can be replicated in Dhaka and elsewhere in Bangladesh as well as in other Asian countries. These projects have disproved the belief that waste processing is not appropriate for densely populated residential areas because of the stench it produces. They have demonstrated that small-scale compost plants can be located within the community provided that the appropriate scientific composting method is followed. They have also shown that NGOs can play an important role in initiating and demonstrating new concepts and providing technical know-how and training to others.

The Mirpur experience has demonstrated that decentralized compost plants are commercially viable whilst providing socially acceptable work for women from the informal sector. Initially, marketing of compost was a major problem, but this was overcome by involving specialized fertilizer companies with extensive marketing networks.

Waste Concern's successful pilot project demonstrated how creative ventures, in which non-government and private sector organisations support the work of waste disposal authorities, can tackle the serious problems of waste management and generate revenue for all those involved. "Our experience demonstrates that working together in partnership - local governments, private businesses, social organisations and communities can pool their resources and expertise to discover innovative ways for tackling the staggering waste problem in a comprehensive, efficient and sustainable way," says Maqsood.

Anil Chitrakar, an Ashoka Fellow who has worked in urban planning and management, environmental education, and alternative energy in Nepal, said after visiting Waste Concern's projects in Dhaka, "The idea is going to expand exponentially, because they have been able to secure interest and demand from hundreds of thousands of farmers in Bangladesh who have, so far, been supplied with imported chemical fertilizers."

Besides producing environmental benefits, Chitrakar said Bangladesh will reap significant foreign exchange savings by replacing purchases of imported chemical fertilizers with locally-produced bio-fertilizer. "The fact that the same distributors are marketing the compost will mean great things for the farmers and their farms, the foreign exchange reserves of Bangladesh, and the status of garbage

management in cities like Dhaka," he said. But this kind of impact will only be felt if Waste Concern is successful in scaling up operations in Dhaka and other Bangladeshi cities.

Scaling Up

Waste Concern sees its future role as catalyst and knowledge broker. To this end, the organisation constantly maintains and expands its network in order to provide appropriate knowledge and support. Government agencies, they argue, should be playing a far more active role in Public-Private-Community Partnerships and in providing training and technical advice.

Waste Concern's success in brokering the first municipal-private partnership in waste management in Dhaka City was no mean feat in a country where most ministries had previously shown interest only in expensive, mechanised projects of the kind that have failed in most developing countries. Despite known failures, projects of this nature remain alluring to government agencies. Recently the Ministry of Environment actively considered a project put forward by two international companies to convert waste into energy using Plasma Technology, despite arguments put forward by Waste Concern's team of experts that this was not financially viable because of the low calorific value and high moisture content of the waste. Despite Waste Concern's success, Iiftekhar and Maqsood know they have a long way to go to achieve the policy reform needed to scale up the establishment of community-based composting plants.

The Regional Seminar on Community-Based Solid Waste Management organised by Waste Concern in February 2000 highlighted the common problems facing all community-based solid waste management schemes as they attempt to scale up their operations. The seminar focused on the need to integrate community-based schemes within the formal municipal solid waste management system. But this requires alterations to municipal ordinances to accommodate the inclusion of NGOs, CBOs and Micro enterprises into the mainstream of solid waste management. Whilst Maqsood and Iftekhar have been successful in incorporating recycling and composting within the National Sanitation Policy, they have not yet been successful in incorporating this in the by-laws of municipal authorities. In India this was achieved through the intervention of the Supreme Court; Maqsood and Iftekhar have established links with the people in India responsible for this achievement and hope to use this experience to do the same in Bangladesh.

The Seminar provided a useful platform for a regional exchange on the experiences and practices of community-based solid waste management. Maqsood and Iftekhar were encouraged to see that all the regional countries were following the same concept - i.e. promoting door-to-door collection, source separation, neighbourhood composting and advocacy for awareness building. In this way, the various experiences of different countries reaffirmed their model.

For Iftekhar and Maqsood the success of the community-based program depended largely on identifying and addressing the community's needs while project sustainability depends on involving them in the cost-recovery/cost-sharing process. But the full potential of this kind of project will only be realized they argue, if the government or municipal authorities provide land free of charge or at a nominal rate to the entrepreneurs interested in running the project as well as assistance in marketing the compost.