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SUSTAINABLE ENVIRONMENTAL SANITATION AND WATER SERVICES

## Community initiatives and recycling in Dhaka

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DHAKA, THE CAPITAL City of Bangladesh, the fifth densely populated country of the world (PRB, 1998), is the 22<sup>nd</sup> largest urban agglomeration in the world with an approximate population of 10 million. Dhaka is predicted to be the 9<sup>th</sup> megacity in the world with about 20 million residents in the year 2015 (Sadik, 1996) with a population growth rate of 6% per annum (Rahman and Islam, 2000) in comparison to the annual average growth rate of 2.01% in Bangladesh (Ahmed, 1994). Megacity Dhaka faces serious environmental degradation and health risks due to throwing and keeping municipal solid waste scatteredly on streets and public areas. Solid waste management study was carried out in DCC and Gazipur municipality of the City to assess the expected potentiality and prospect of community involvement and recycling in improving deteriorated status of solid waste management of the city.

### Result and finding of the study conservancy wings

SWM services in DCC is being operated under the conservancy department executed by Chief Conservancy Officer (CCO) and other conservancy and supervisory staff under the direct supervision of the Mayor and Chief Executive Officer (CEO). Besides CCO, there are 1 Deputy Chief Conservancy Officer, 2 Assistant Chief Conservancy Officers, 10 Conservancy Officers, 90 Conservancy Inspectors and 5272 sweepers/cleaners/laborers for managing DCC solid waste management operation. In Gazipur Paurashava, solid waste management system is operated under the conservancy section executed by one Health and Conservancy Officer (HCO) and other conservancy and supervisory staffs under the direct supervision of the Paura-Chairman and CEO. There are a suitable number of conservancy inspectors and adequate number of sweepers, cleaners and laborers (regular/daily basis/master role) for serving SWM in Paurashava.

### Waste generation and collection

In Dhaka, waste generation during the last two decades has increased enormously at an average annual rate of 8.96% per capita per year. Solid Waste Sectoral Analysis carried out by the World Bank, EDA & WEDC and information collected from DCC and Gazipur Paurashava shows that solid waste is generated at 0.6 kg/capita/day in DCC area and at 0.3 kg/capita/day in Gazipur (World Bank, 1998; Kazi, 1999).

In 1984 the manual conservancy service was borne to manage human excreta and refuse in Dhaka City under the care of the then Municipal Committee. The methods (manual laborers) used to collect and dispose of the human excreta to the trenching grounds and refuse were collected by cleaners manually with bullock-carts and disposed off in nearby low lying areas. These manual methods were abolished in 1983 introducing motorized vehicle system to collect and carry the refuse to the dumping sites. To cope with the increased volume of solid wastes, DCC introduced night service in 1989 and 50-55% waste is collected and carried to final disposal sites during night. In 1987, community based waste collection was first introduced by Khurram Mahboob, a dedicated youth of Kalabagan area. Currently the local ward commissioners of DCC, Gazipur, Tongi and Narayangang Paurashava are also taking initiative & mobilizing the community in collection and storage of waste. In Dhaka City, garbage trucks, pushcarts/handcarts, rickshaw vans, container-carrying trucks, sometimes tractors are used to collect, transfer and transport of municipal solid waste. Rickshaw vans are used by CBOs to collect waste from door to door and to dump it in the dustbins/containers of DCC/Paurashavas.

### Recycling

No formal recycling is practiced in Dhaka City; only housewives and scavengers (tokai) collect recyclable products from household waste generation places, dustbins and open dumps to earn a little pence in a disorganized way. In Dhaka City, wastes of some market value are being reclaimed or salvaged in three stages.

**First Stage of Salvaging:** In the first stage housewives, servants and maid servants in the household of low to average income separate the refuse of comparatively higher market value and sell them to the street hawkers. Home interview reveals that the majority of the people of the new city (e.g. Dhanmondi, Kalabagan, Banani and Gulshan) feel that effective waste recycling in household level is possible using designated and colored poly-bags or containers. They are also interested to buy such recycling bags if the price remains within their financial ability. But majority of the people of old city (e.g. Lalbag, Islambag, Sadarghat and Sowarighat) are completely unaware of recycling, pollution and spreading of diseases and are not ready to pay extra cost for recycling bags although recycling interest is grown to them. Table 1 shows the response of the 80 (40 from old city and 40 from new city) householders of Dhaka City about recycling in DCC jurisdiction.

**Table 1. Results of household interview on recycling for SWM in DCC area**

AREA	Education of Householders (Education of Housewives)			Profession of Householder (Profession of Housewives)			Awareness of People About			Willingness to Pay for Recycling
	Illiterate	Below SSC	Above SSC	Busi-ness	Service	Unemployed	Household Recycling	Pollution & Disease	Recycling Interest	
New City	4(12)	19(19)	17(9)	20(6)	18(23)	2(11)	9	22	39	40
Old City	32(36)	6(3)	2(1)	26(0)	10(2)	4(38)	0	0	23	5

**Note:** SSC stands for Secondary School Certificate degree.

**Second Stage of Salvaging:** The second stage of reclaiming is carried out mainly by tokais. Tokais are poor children of slum areas who collect the garbage and waste of low market value from dustbins and street sweeping accumulation points. Tokais are the neglected part of the community spend their days in scavenging and salvaging recyclable items amongst the rotten wastes of the city that is shared by cows, goats, dogs, rats, rodents etc. Sometimes unemployed slum parents collect refuse from dustbins and streetside. Interview results of the slum families involved in salvaging of refuse (20 families in each slum area) from selected areas viz. Mahakhali, Tejgaon, Magbazar, Agargaon and Islambagh areas of Dhaka City is given in table 2.

**Third Stage of Salvaging:** Waste pickers do the third stage of salvaging when refuse is unloaded by garbage trucks at the final disposal sites.

### Community involvement in solid waste management

Failure and inefficiencies of local government necessitate community involvement and participation in solid waste management where all the inputs of SWM are collected from the community itself. In many places of Dhaka City, many individuals and groups have come forward and organized their own collection systems to improve the local situation of SWM. CBOs are also involving scavengers in solid waste recycling in Dhaka City.

**Local Initiative in Waste Collection:** Local initiatives in solid waste collection was first introduced in 1987 at Kalabagan area of Dhaka City by Khurram Mahboob, a dedicated young man who came back home from Germany after completion of higher study. Experiencing the stench and sight of refuse lying uncollected here and there he conceived of a community based doorstep collection of garbage. He discussed his plan regarding solid waste collection with his friends and neighbors. They campaigned door to door and briefed the public about collection procedure and sought their co-operation. His mini community based waste collection project 'Parichahanna Kalabagan' became successful. Based on the success of Kalabagan project, a number of small size community based waste collection schemes were replicated in many areas such as Katalbagan, Shamoly, Mirpur, Banani, Uttara areas of Dhaka City. Among them 'Earth Watch' project in Baitul Aman Housing Society of Shamoly and 'Pallabi Paribesh

Shongrakhkhan' project in Mirpur attracted the public. It is reported that over 130 such local initiatives actively operate in more than 100 local wards of DCC and the municipalities of the city and are providing services to more than 10,000 householders of the city. Community based voluntary organizations are working in DCC area for door to door collection and dispose of their waste into the nearest roadside bins of DCC. But local initiative in solid waste management is being hampered in many places due to different sort of problems related to city dwellers and

**Table 2. Refuse salvaging by slum families in Dhaka City**

AREA	NUMBER OF PERSONS INVOLVED IN SALVAGING FROM EACH FAMILY				DAILY INCOME IN TAKA FROM REFUSE SALVAGING				EDUCATION		AMF	PRINF
	Boy	Girl	Father	Mother	Boy	Girl	Father	Mother	L/GNS	IL	AMF	PRINF
Mohakhali	18	10	2	6	8-18	8-15	20-25	15-20	(0)/(8)	12	2	16
Tejgaon	20	12	4	8	9-15	5-12	20-30	15-25	(0)/(0)	20	4	17
Magbazar	17	9	3	7	8-15	6-15	20-30	18-22		20	2	15
Agargaon	16	7	0	0	9-16	7-14	0	0	(0)/(9)	11	5	18
Islambag	17	6	0	0	8-18	7-18	0	0	(0)/4	16	3	12

**Note:** L/GNS stands for Literate/Going to Night School, IL for illiterate, AMF for awareness about Medical Facilities and PRINF for Planned Recycling Interest with necessary facilities.

others. Resident users although being happy with the services provided by local initiators raise question to pay to two agencies for the same service who are paying to the local initiators for their services as well as 2% of holding tax are being paid by them to DCC for conservancy services. Sometimes people don't like to be disturbed by the collectors of local initiators as they whistle, knock the door, press the calling bell and drum. Study shows that realizing service charge is bothersome as some of the users do not pay on time although most of the resident (about 60% users) pays service charge regularly. There are some households who often try to compel the collectors of local initiator to take bulky waste. Local initiators face problem of dumping waste due to unavailability of adequate number of bins. Irregular collection of waste from bins and replacing demountable container filled with waste hampers the door to door collection of waste from households by local initiators. Whenever there is any intervention between CBOs and DCC cleaners, DCC people disappear from the locality and roads & drains remain unclean for days and weeks.

**Experience of Waste Concern in Recycling and Resource Recovery through Composting:** Analysis reveals that mixed solid refuse of DCC contains high moisture content (on average 45-55%), high ash, very high organic contents (on average 84.37%) and comparatively low paper and plastic contents representing the high fertilizer value of the waste and potentiality for conversion of the waste into good compost (Yousuf, 1996). With this end in view, Waste Concern's Pilot Demonstration Plant was established at Mirpur in January 1995 which was less capital intensive, sited near urban residential areas, caused minimum nuisance from odors and flies, produced environmentally safe product and well suited to Dhaka's waste stream, climate & socio-economic condition. The collected domestic organic waste is converted to compost in their plant adopting aerobic composting technique. 500 kg of compost was produced daily by Waste Concern processing two tons of solid waste in 1999 selling at a price ranging from Tk. 2.5 to Tk. 5 per kg. The quality compost produced by Waste Concern has good NPK value. Based on the evidence gathered so far by this pilot project, it appears that such micro-enterprise can be replicated in other places of DCC area (Enayetullah and Sinha, 1999).

**Prospect of Local Initiative in Recycling:** Hundreds of men, women and slum children known as tokais, sometimes the whole families of the scavengers support themselves by earning little pence through waste picking living at/near the waste collection points or the landfill/dumping sites. Unfortunately such recycling is not well organized by DCC, municipalities or any type of organizations although in some parts of Dhaka City, CBOs are being involved to organize tokais in solid waste recycling especially in low income slum areas. In slum areas, mini community associations/organizations are contributing to organize tokais for

recycling. Recently Waste Concern is planning to tag other CBOs in the adjoining neighborhoods to bring their collected solid waste in the recycling and resource plant. However due to such combined initiatives, the localities are now much cleaner leading to the better environment e.g., effective, efficient and easy management of household waste; less bothering from the waste; better service with affordable charges; raising awareness about solid waste among the public; clean and environmentally friendly areas etc. In order to get more benefits from recycling, the community should organize tokais into co-operative or self-help groups in each locality of DCC. Being neglected part of the society, role and contribution of the tokais through recycling in the solid waste management is not properly evaluated and assessed. Disorganized and unplanned efforts of tokais in recycling should be designed economically and effectively ensuring their proper position. From this point of view, communities should lobby for the changes of the policies regarding the legal status of tokais and to improve the image and social status of tokais. Training for increasing the productivity of tokais and the value added to recycled products, increasing the bargaining power of the tokais should be arranged. Effective participation of tokais in local decision making process for community recycling should be ensured. Appropriate low cost technologies such as composting for solid waste involving the tokais should be developed through a planned program in integrating resource recovery system in DCC area involving tokais.

## Conclusion

The research study reveals that solid waste pollution scenario of Dhaka City is severe and dreadful; more than half (about 60%) of the solid waste produced in Dhaka City remains uncollected and disposed locally deteriorating public health and causing environmental degradation in the metropolis with gloomy and dismal scenario. SWM in Dhaka City needs major improvement in storage, collection, transport, recycling, treatment and disposal to reduce adverse impact on environment and public health. In Dhaka, it is not possible for a particular group of actors such as the conservancy wings of DCC and the Paurashavas alone to handle the solid waste management, make the process sustainable, keep the city clean, reduce the environmental pollution and to improve the environmental health and public life. Rather, city dwellers, community based organizations, DCC, Paurashavas and other stakeholders should come forward together to combat the solid waste problem. Community collection as well as organized recycling initiated by CBOs and fostered by DCC and Paurashavas should be introduced involving householders, tokais etc. Due consideration should be given to the public initiatives and local people's participation at every stage of solid waste management to make it sustainable.

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