

Solid Waste Management in Dhaka: A Participatory Approach

MUHAMMAD ABUL HASNAT¹

Concept

Local governments of both the developed and developing countries are concerned with the environmental consequences of waste disposal. Until recently in the developing countries like Bangladesh the collection and disposal of solid waste was taken as one sided responsibility on the part of the municipal authorities burdened with financial & management problems. But nowadays a participatory planning approach in a process through consultation, collaboration & co-ordination among the stakeholders has become a reliable option.

Dhaka, the capital city of Bangladesh is presently considered as 22nd largest city in terms of population & rapidly turning into a mega city. Solid waste management (SWM) in Bangladesh is a function of the municipality & Dhaka City Corporation (DCC) is the municipal authority of the capital city. Collection & disposal of solid wastes in the DCC area of 360 sq. km is the responsibility of the conservancy department headed by Chief Conservancy Officer. The increased congestion of the city area, the high population density & the rapid growth all around it has made it impossible to clean the streets & drains as fast as the waste is thrown onto them. So the streets remain unclean after daily sweepings and the drainage ditches & channels get blocked due to unwanted waste throwing. Away from the other parts of the SWM system like transportation & disposal ; the collection system is the primary challenge for conservancy department of DCC.

Kitakyushu Initiatives has initiated a pilot project in Dhaka city with close co-operation from DCC & non govt. organizations (NGO). This project not only initiated public participation in the project area, it also inspired other NGOs & community based organizations (CBO) to start community based, participatory door to door waste collection system in other parts of Dhaka city.

Laws and Regulations related to Waste management

The Municipal ordinance 1983 (amended in 1999) and the Bangladesh Environmental Conservation Act 1995 are the legal foundations on solid waste management. These foundations, however, do not cover the solid waste operations comprehensively.

The new legislation needs

- To develop formal policy for collection & disposal of all categories of waste.
- To categorize all wastes in terms of their danger to environment.
- To enable correct procedure in SWM , it's enforcement & to ensure legal action against the polluters.

Local government and Dhaka City Corporation

- Dhaka Municipality was established in 1864. There are two types in urban local governmental bodies: City Corporations and Municipalities. Municipalities are comprised of urban towns with a small population. Municipalities are divided into a number of wards depending on the size and population. Commissioners are elected directly by popular vote. There is one Chairperson in a Municipality. He is similarly elected directly by popular vote. Three elected representative represents each ward.
- In considering size, population and law and order aspects, the government upgraded larger municipalities of the country first into Municipal Corporations then into City Corporations.
- The Institutional Head of the City Corporation is Mayor. The City Corporations are divided into wards. DCC is thus divided into 90 wards. Adult taxpayers of municipalities are eligible to vote. The Mayor and Commissioners are directly elected by popular vote of the city residents. Elected Commissioners represent their respective wards. The Mayor of Dhaka City Corporation holds the status of a full

¹ Executive Engineer, Dhaka City Corporation, Dhaka, Bangladesh.
Email: hasnat@gononet.com / URL: www.dhakacity.org

Cabinet Minister. The Mayor of City Corporation, along with ward Commissioners, constitute Councils of City Corporation. These Councils are responsible for formulation of policies, approving annual budget, undertaking development schemes and execution of projects and programs of the respective City Corporation. The tenure of such representative bodies is five years. The Mayor chairs the Council meeting. In case of his absence the senior member of the panel of Mayor chairs the meeting.

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Executive agencies of DCC

There are 12 executive departments in DCC:

- 1) **Administration and Establishment:** Looks after recruitment, appointment, transfer, posting, career planning, welfare and benevolence of the officials and staff.
- 2) **Engineering:** Responsible for all types of civil works, street lighting and electrical work, mechanical works and construction markets and other establishments.
- 3) **Primary Health:** Management of city hospital, mosquito control, enforcement of pure food supply regulations, registration of births and deaths, preventive health care, taking care of live stock of the city and supervision of slaughterhouses.
- 4) **Social Welfare:** Management of graveyards and burials, education, cultural and recreational activities, management of library.
- 5) **Revenue Collection:** Assessment and collection of tax, tolls, fees, rates and rent.
- 6) **Accounts and Audit:** Preparation of annual financial statement, payment of bills and salaries and keep papers updating for govt. audit, maintenance of ledger book and cashbook.
- 7) **Conservancy:** Cleaning of streets, maintenance of drains, disposal of all types of wastes, management of dumpsites and management of waste carrying vehicles.
- 8) **Estate Management:** Responsible for management and administration of immovable properties of the City Corporation, eviction of the unauthorized occupants on the land and properties of the Corporation, procurement or disposal of immovable property of the Corporation.
- 9) **Store and Purchase:** Responsible for purchase of all purchasable items except vehicles and heavy engineering equipment and supply of store materials as per requisition of the respective departments.
- 10) **Transportation:** Procure, maintain, fuel, and manage all the vehicles of the Corporation.
- 11) **Law:** Takes care of legal matters of DCC including contesting to the courts for protection of the interest of DCC.
- 12) **Public Relations:** Takes coverage of press and media and keeps the Mayor informed of reports published in different Dailies concerning DCC.

- The territory of DCC is divided into 10 administrative zones. Government personnel called Zonal Executive Officers heads each zone. He is aided by other departmental staff to supervise and execute the decision of the Corporation. These Departments and zones are responsible for execution of decisions of the Council within their respective jurisdiction.
- There are a few positions in the City Corporation reserved for officials of the National government. For a specified period, the government assigns officials to work with the City Corporation on a set of terms and conditions. The government may withdraw/replace any such officials at any time for public interest.
- The City Corporation is run and managed as per an Ordinance passed by the Parliament of the country. The Ordinance includes a schedule, which provides manpower, classes of officials, their pay structure and areas of responsibilities. These officials, as described in the schedule, are the permanent strength of the Corporation.
- Own sources of fund of the City Corporation are household taxes, rents from markets, shops and establishments, fees from licenses, tolls from different temporary public places. The Corporation's own resources are not enough to cater to the different development activities of the city. The government's financial support has therefore become a regular phenomenon for the Corporation. In the annual budget more than 50 percent fund comes from the government treasury in the form of block or total allocation. Every year at the end of financial year (June-July), an annual Budget is prepared and submitted for Council approval at a formal meeting.

Solid waste management of DCC

- The solid waste problem in Dhaka city is very acute in comparison to many cities in developing countries. Daily production of solid waste in Dhaka City is more than 4000 Metric Tons. Of that, 200 Metric Tons of hospital and clinical waste is a mixture of toxic chemicals, radioactive elements and

pathological substances. 15 to 20 percent of medical wastes are highly dangerous for human lives. When dumped with other municipal wastes in the open land, this waste poses a serious health threat to city dwellers. The nature of solid waste is changing over time and with urban development. Of the solid wastes, plastic and polyethylene goods also cause problems towards human health, the environment and drainage system.

- The National Policy For Safe Water Supply & Sanitation 1998 refers to the empowerment of setting tariffs, by-laws & other needs concerning waste management and places emphasis on organic waste recycling such as compost, bio-gas. The policy also suggests the transfer of the collection, removal and management of solid waste to the private sector where feasible.
- The implementation of regulations is weak and public awareness level is low. No initiative has been taken to inform people about rules and regulations. Enforcement mechanisms are slow and bureaucratic.

Major gaps and barriers for efficient solid waste management

Institutional: All activities of DCC are carried out under the appropriate Ordinance. Near about 3000 temporary cleaners have been appointed on daily basis. They do not have job security. They work on the “no work – no pay basis”. This situation causes problems in the efficiency of solid waste management. The Ordinance does not provide enough legal action against violators. As a result city dwellers do not dispose of waste in designated places, and even do not carry out the timely disposal of waste in nearby bins. This area must be strengthened. For this purpose the relevant sections or provisions of Ordinances should be amended.

Political: No amendment in the Ordinance is possible without passing it through the National Parliament. The process of submitting this to the Parliament is lengthy and difficult. It involves a large number of ministries and departments. However, it is not impossible. If problems in the Ordinance can be put forward with sufficient logical arguments, the government would help solve them as quickly as possible.

Practical: Dhaka is already a large city and is expanding rapidly. There should be a consistent forward plan to manage solid waste for the future. There is no scientific and technological method for the disposal of solid waste. As a result, large pieces of land are used and causing pressure, as well as having a negative impact on the environment.

Financial: DCC has very much shortfall in SWM logistics & finance. So it needs financial & logistic support from Govt. of Bangladesh (GOB) and as well as from donor countries & agencies.

Community based Waste Management

- It is clear that due to limited resources and organizational capacity, it is difficult for DCC to ensure efficient and appropriate delivery of solid waste collection and disposal services to the entire city population. Therefore, DCC is encouraging community based organizations and local NGOs to organize and carryout community waste management programs (mainly house to house collection and disposal at roadside bins).
- Moreover, as the capacity of landfill area is coming to a saturation point in the near future, the separation of solid waste at source will divert a major portion of organic waste for composting and some materials for recycling, thereby relieving the pressure on the landfill.

In the meantime, DCC can concentrate on formulating policies for overall solid waste management, which requires substantial funding and legislation.

Kitakyushu Initiatives for Dhaka City

Objective of the Project: To improve solid waste management capacity of DCC's ward-22 by strengthening community waste management programs through public participations.

Aim of the project:

Implementation of a pilot activity in Rampura (Ward 22, Zone-4) to include the following components:

1. To improve public awareness through local and mass media campaign.
2. To improve the level of stakeholder participation in at source separation, house to house collection, and primary disposal of solid waste. To improve the level of stakeholder participation in at source separation, house to house collection, and primary disposal of solid waste.

Project area Rampura (Ward 22, low to middle income households)

- DCC concentrated on low to middle class households, which make up most of the population in Dhaka. Hence, they have identified Rampura (Ward 22 in District 4) as the site for the pilot activity.
- Bangladesh Integrated Environment Development Forum (BBIEDF) and CBO engaged by DCC is providing house-to-house collection services in 39 wards and they have recently started these services in different areas of Dhaka city.
- Total population of ward-22 is about 53,000 and the amount of waste generates in the area is 26.5 tons/day. The community is unaware about the hazardous impact of the waste; therefore many households dispose their garbage in the drains, ditches and on the open street.
- BIEDF has been engaged 8 number of rickshaw vans for the collection activity. The door-to-door collection begins at 12am and continues till 7 pm. There is a conservancy supervisor who monitors the project and report to the project authority.
- However, for more effective house-to-house collection, other conditions should be met to address the issue of proper solid waste management. This holistic approach has been taken as a pilot activity under Kitakyushu Initiative.

Pilot Activity under Kitakyushu Initiative

Rampura (Ward 22 in Zone-4 of DCC), where most of the households are identified as low to middle income group. Following tables provide information on Ward-22, Solid Waste Management Project and DCC inputs respectively.

Table-1

SL.No.	Topic/Issue	Figure/Number
1	Area	23 sq.km
2	Population	53,000
3	Percentage of waste generation	0.5kg/day/person
4	Total waste generation	26.5 tons/day
5	Percentage of HIG	30
6	Percentage of MIG	65
7	Percentage of LIG	5

Source: Zonal Office, DCC 2001

Table -2

SL. No.	NGO Input in the project	Quantity/Number
1	Rickshaw vans	8
2	Van drivers	8
3	Bye-cycle	1
4	Monitor	1
5	Waste sorting Center	2

Source: BIEDF, 2002

Main activities under Kitakyushu Initiatives

- Public awareness building programs have been organized for residents to understand the importance of proper solid waste management, with reference to health and other environmental impacts of improper solid waste disposal. The public awareness has included also the impact of hazardous solid waste from hospitals and other commercial activities, so that households will able to impose political pressure for the proper disposal of waste.
- Households advised through public rally and leaflet distribution to dispose of solid waste properly and not to throw solid waste in the streets, open drains, and near by areas.
- Households also advised to separate solid waste, mainly organic and inorganic, and recyclable materials. And proper initiative for recycling of organic materials will be taken if any financial support is received from GOB, DCC or IGES.
- Proper primary disposal to either well-protected collection bins or to transfer stations could be build if proper fund is disbursed, where from DCC should effectively remove the waste for final disposal. The area for building transfer station has also been selected in Rampura area.

Conclusion

- The city corporations are to be empowered to set tariffs and by-laws.

- The participation of private sector and NGOs in SWM has to be encouraged by the government. The participatory approach what DCC has taken with the initiative of IGES, should be authorized by the proper legal framework.
- Appropriate measures have to be taken to achieve the highest waste recycling rates as possible. It will practically reduce the pressure on DCC in SWM.
- In Kitakyushu Initiatives project area a site for transfer station has been selected. DCC will provide this land to BIEDF free of cost. But the fund for the infrastructure development of the station is yet to be assured. Once this station is established, the vans now collecting waste from the households & disposing in 9 different containers & bins, can dispose at a single place. This will minimize the scattered nuisance created around the containers & bins, will ease the flow of traffic & pedestrians and above all the collected waste can be segregated. The organic waste treatment methods like composting and bio-gas production will be promoted and contamination of ground water by waste materials will be discouraged.
- Waste Concern, an NGO with the support of DCC & UNDP has initiated a waste treatment pilot project & now producing compost commercially in a small scale. We can plan this type of projects at least one in every 10 zones of DCC. But it needs assistance from IGES or any other donor agencies. DCC can provide land & other administrative support where it is possible.

Annex I. Composition of Solid Waste in Residential and Industrial Areas

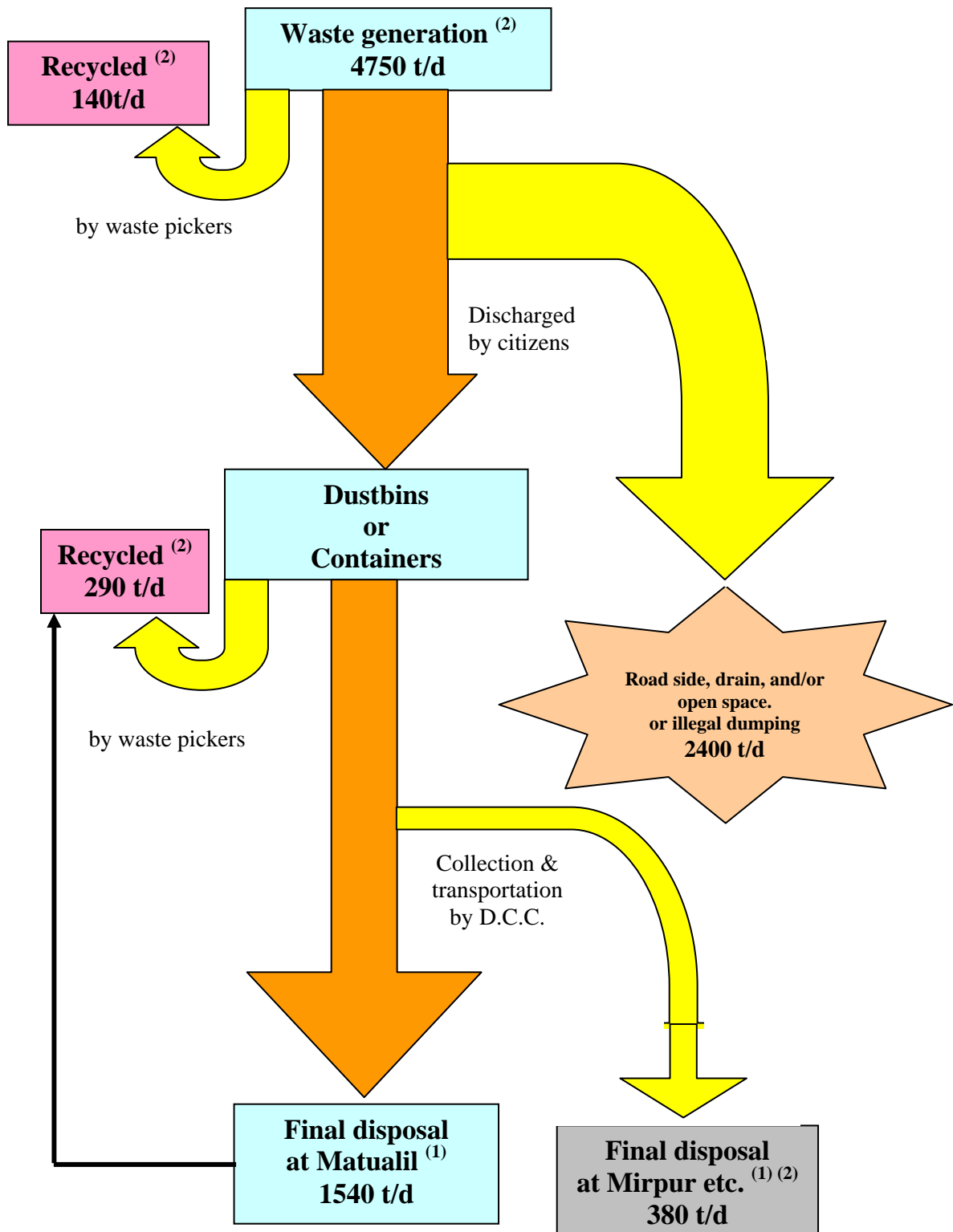
Component (%age by dry wt.):	Mixed waste	Industrial waste	Residential waste	Commercial waste
Food and veg. waste	70.12	26.37	59.91	62.05
Paper products	4.29	7.59	11.21	6.28
Plastic, rubber & leather	4.71	6.01	17.67	4.62
Metals	0.13	-	0.15	0.28
Glass & Ceramics	0.25	-	-	0.37
Wood	0.16	-	-	-
Garden wastes, tree trimmings ,& straw	10.76	4.32	8.76	2.86
Cloths	4.57	46.2	-	18.93
Rock, dirt & Misc.	5.01	9.49	2.30	4.62
Moisture Content(per cent)	65		50	54

Source: GOB and World Bank, 1998

Constituents (% by wt)	Residential waste	Commercial waste	Industrial waste	Mixed waste
Moisture	50	54	60	59
Carbon (C)	26.06	17.81	9.90	12.70
Hydrogen (H)	3.53	1.92	2.00	2.25
Nitrogen (N)	1.62	0.46	0.58	0.62
Sulfur (S)	0.01	0.02	Negligible	Negligible
Ash	18	22	25	22
Oxygen (O)	0.78	3.79	2.52	3.43
Calorific value,Btu/lb	2600	2254	1680	1968

Source: BCSIR'1998

Annex II. Solid Waste Stream in Dhaka City



Source: (1) Survey of our JICA project, 2000
(2) Survey was conducted under the guidance and supervision of Dr. Shamsul Haque Bhuiyan, 1999.