

## **Solid Waste Management of Rajshahi City Corporation in Bangladesh: Policies and Practices**

A.K.M. Mahmudul Haque\*

**Abstract:** As an urban governance institution, City Corporation is mainly responsible to enforce existing policies in managing its solid waste through recycling and non-polluting disposal methods. This article is an endeavor to evaluate the effectiveness of these policies at the urban centers of Bangladesh, using Rajshahi City Corporation (RCC) as a case study. It is an empirical research mainly based on primary data. Questionnaire survey, key informant interview, and observation were used to reveal the state of implementation of solid waste management policies into practice. Data were collected from local government officials and field staff involved in implementing solid waste management laws and policies, as well as non-governmental stakeholders from the communities, such as residents and civil society members. The major finding of this research is that RCC lacks effective practices of solid waste management policies.

**Keywords:** Solid Waste, Policies, Collection and Disposal of Waste, Rajshahi City Corporation

### **1.0 Introduction**

Solid waste management is one of the mandatory functions of urban local governance institutions in Bangladesh. About 28.4% of the total population of the country lives in urban area and the annual growth in urban population is over 2.96% (Population Census, 2011). Solid waste generation has also increased proportionately with the growth of urban population. As such, urban governing institutions are facing difficulties to keep pace with the demand for adequate solid waste management and conservancy services. They lack developed facilities, strong institutional and legal framework, adequate human resources and consistent practice of relevant policies. Consequently, urban solid waste management has become a major concern for the cities and towns of Bangladesh. Research reveals that most of the urban centers of Bangladesh are little more than waste dumps. Industrial enterprises discharge their toxic and other harmful solid and fluid waste in untreated form into neighboring areas and water bodies. Domestic waste water is also discharged into water bodies. This not only pollutes the water but also adversely affects the biodiversity and ecological balance. Similarly, hospitals and clinics dispose their harmful clinical waste without concern for its environmental impact. Wastes from household activities, hotels and restaurants, markets and shopping places, slaughterhouses, etc. are thrown into open tips.

This system of open dumping of waste causes irreparable loss to the environment by polluting land, water and air, adversely affecting human health and lowering people's quality of life. In addition, it causes cardiovascular diseases, cancer and damage to crops and plants, by acid rain. The final disposal of urban solid waste is not yet sanitized. The

---

\* Associate Professor, Department of Political Science, University of Rajshahi, Rajshahi, Bangladesh.

harmful consequence is the emission of greenhouse gases. It is estimated that, in Bangladesh, 2.19 million tons of carbon dioxide is emitted per year from human-generated urban waste (Iftikhar, 2005: 13).

With the multiplicity of environmental problems created by urban waste, now the question of governance in waste management is more important than ever. Obviously, as an urban governance institution, Rajshahi City Corporation (RCC), along with other non-governmental organizations (NGOs), is working for ensuring good governance in the management of solid waste in their jurisdictions. However, the overall situation is not improving; rather it is deteriorating day-by-day. It is perceived that there are some gaps between policies and practices in the governance of its solid waste management. This article is an endeavor to identify the gap between policies and practices in solid waste management in RCC.

## **2.0 Methodology**

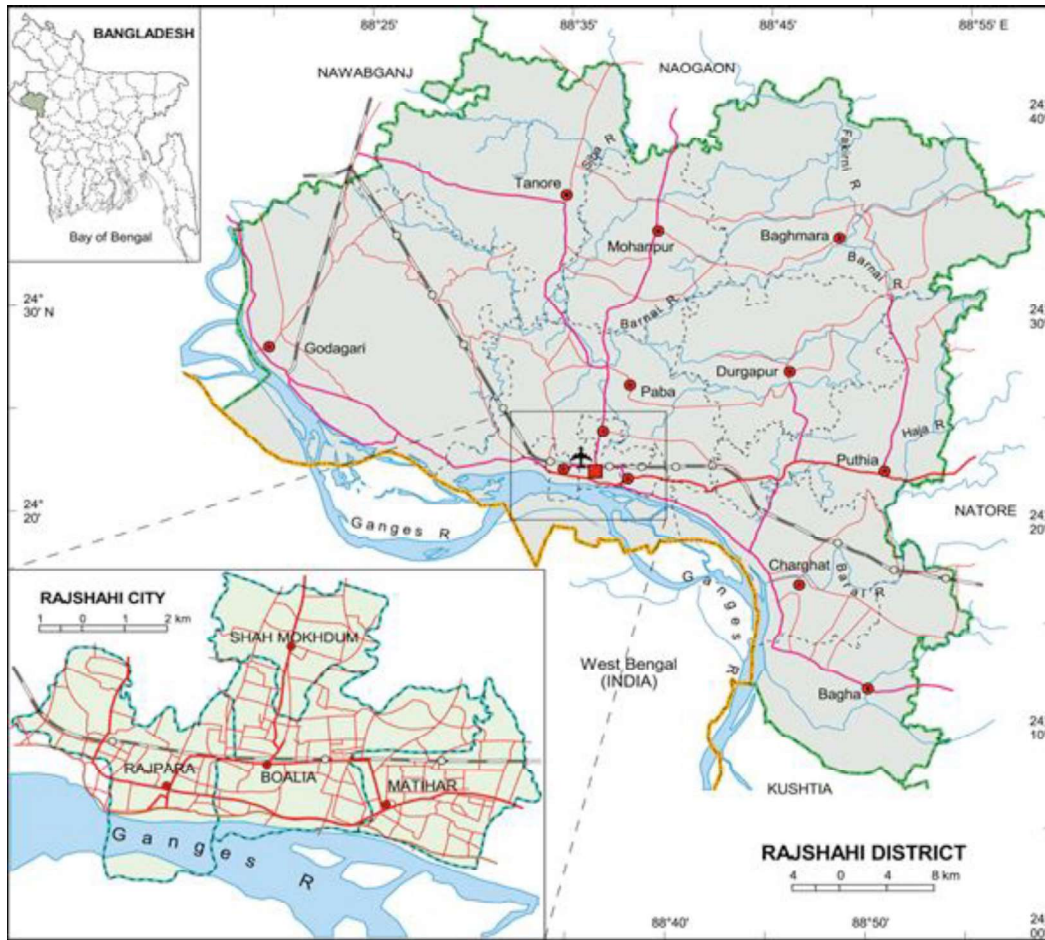
The study is mainly based on the primary data collected by questionnaire survey, observation and key informant interview. Both qualitative and quantitative data have been used in this research. Data have been gathered from both primary and secondary sources. Primary sources include field studies, questionnaire, interviews, general review of the activities of solid waste management, government rules and policies, etc. Secondary sources include various research reports and articles, official statistics, relevant books, unpublished study documents, reports, theses/dissertations, daily newspapers, websites, etc.

Four sets of questionnaire, including both open-ended structured and close-ended unstructured questions, were arranged for four categories of respondents i. e. stakeholders (180 respondents), conservancy field staff (124 respondents), executives (6 respondents), and key informant (8 respondents). Stakeholders and field staff have been selected from 6 Wards out of 30 Wards in RCC following cluster sampling techniques. At first, 30 Wards have been classified into 6 clusters based on their urbanization character, like i) Residential, ii) Commercial, iii) Industrial, iv) Hospitals and Clinics, v) Semi-urban, and vi) Outskirt of urbanization. From 6 clusters, 6 Wards, 1 from each cluster, have been selected, following simple random sampling technique. Following this process, Ward no. 5, 6, 12, 16, 25, and 30 of RCC have been selected. Field survey has been conducted in the period of 2012-2014. Collected quantitative data have been analyzed using appropriate statistical techniques. Qualitative data have been analyzed through logical reasoning processes.

## **3.0 Rajshahi City Corporation (RCC)**

Rajshahi City Corporation has an area of 96.72 sq. km. It is located between 24°05' and 25°14' north latitudes and between 88°28' and 88°38' east longitudes. The city has a sub-tropical wet and dry climate which is generally marked with monsoons, high temperature, considerable humidity and low rainfall. The annual rainfall is 1159.9mm. The average temperature is 25.1°C. Temperature is low in January varies from 2.7°C to 14.1°C and high in the month of April to July varies from 22.6° to 41°C. The mean relative humidity is found to be low in March (65%) and high in July-September (88-89%).

**Figure 1: Location of Rajshahi City Corporation**

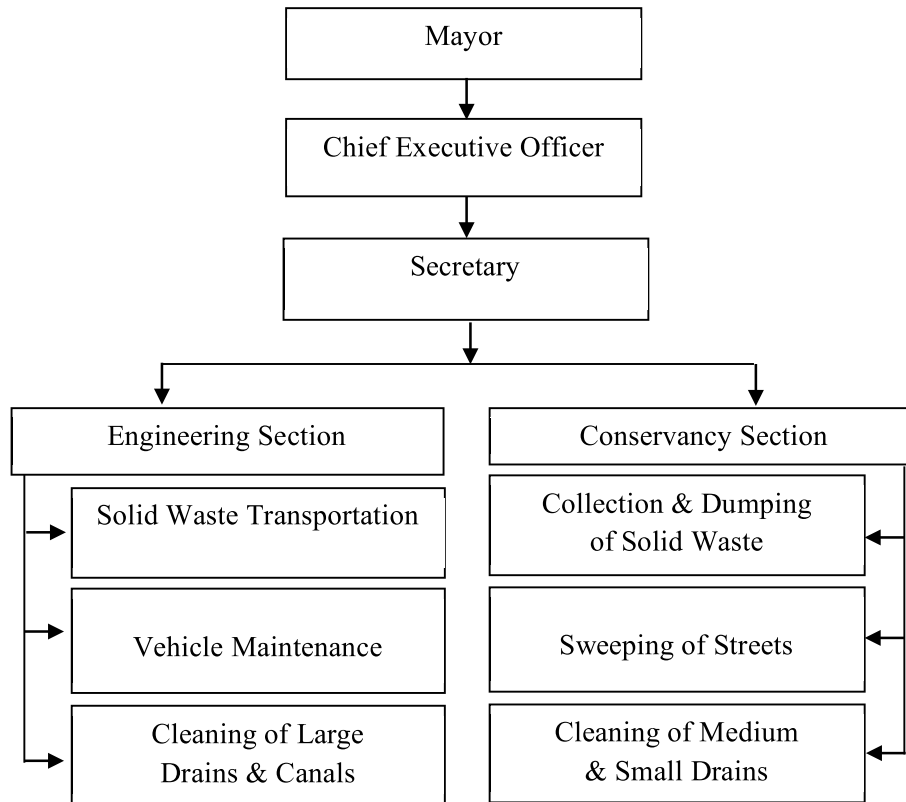


#### 4.0 Organizational Aspects of Solid Waste Management in RCC

Solid waste management is organized by the Conservancy Section of the RCC whose prime responsibility is to collect and dispose of solid waste. The entire area of RCC is served by 384 km *pucca* and 96 km *katcha* road networks. There are about 118 km *pucca* and 162 km *katcha* drains in the City Corporation area. It has 13 *katcha* bazars, 80 hospitals and clinics. RCC sweepers dispose the human *excreta* from pit latrines or septic tanks through manual methods. Most of the sweepers and cleaners are hired on a temporary basis. Recently, RCC has introduced a mechanical road sweeping machine that can sweep 10-15 km of main road per hour (Bangladesh Municipal Development Fund, 2012: 33).

The organizational structure of solid waste management of RCC, at least between the Engineering and Conservancy sections, with some illustrative responsibilities, is shown in Figure 2.

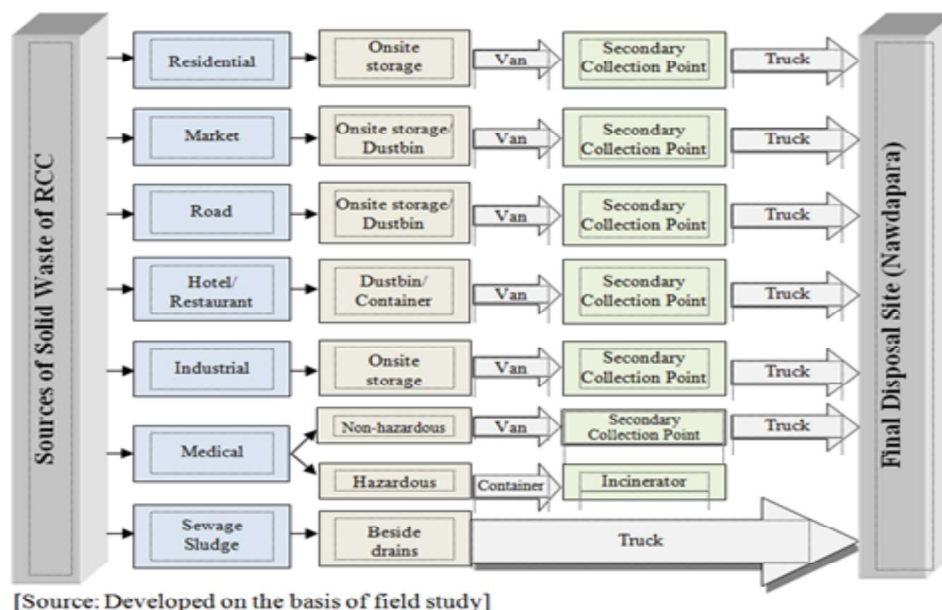
**Figure 2: Organizational Structure of Solid Waste Management in RCC**



Source: Developed on the basis of field study

In RCC, almost all the 30 Wards have primary collection service. In the residential areas, RCC cleaners collect waste from households or residential buildings and small dustbins with rickshaw-vans (manually-pulled vehicles) in the afternoon and bring them to the secondary collection points before evening. There are 19 secondary collection points along with dustbins and open points. Secondary collections take place at night, through dump trucks as per instruction of the Conservancy Inspector. There are 8 dump trucks, 6 trailers, 16 lorries, 2 hydraulic trucks, 216 rickshaw-vans, etc. used for transfer and transport of waste from the secondary points of the whole city. There is one solid waste disposal site in RCC. It is located in Nawdapara which is about 8 km from the city centre. The total area of this disposal site is 16 acres. RCC has a compost plant with 2 tons/day capacity. Yet the compost plant is not processing any waste since it has not been able to get the license from the Department of Agricultural Extension (DAE) for marketing of compost.

**Figure 3: Flow Sheet of Present Solid Waste Management System of RCC**



RCC has 1,073 waste management staff, including drain cleaners (242 for 30 Wards), sweepers (226 for Wards and 151 for major roads), rehabilitated women sweepers 29, market waste cleaners 46, clinical waste workers 2, Van workers 180 for Wards, 36 for central) truck/tractor workers 77, waste management supervisors 84 (central 57, and 27 for 30 Wards) (Accounts Division of RCC, 2012). A major portion of the total expenditure made in solid waste management (SWM) is basically consumed by the component of salary and other allowances for the engaged manpower. Apart from salary, wages and their overheads, there are certain other heads, on which RCC has to spend for SWM. Table 1 indicates the budget expenditure of RCC on SWM for the financial year of 2011-12.

**Table 1: Budget Expenditure for Solid Waste Management of RCC**

Particulars	Expenditure (in taka)	Percentage (%)
Salary and Allowances	66,482,724	93.60 %
Other Conservancy Expenditure	4,544,00	6.40%
<b>Total Expenditure</b>	<b>71,026,724</b>	<b>100.00%</b>

Source: RCC Budget 2011-12

From the table 1, it is found that total expenditure budgeted for SWM in the financial year 2011-12 is Taka 71,026,724, of which 93.60% is consumed under the head of salary and allowances, and 6.40% under other Conservancy expenditure. However, the Conservancy budget does not include the cost incurred for operation and maintenance of the Conservancy vehicles, as well as the salary and allowances for the drivers and helpers.

### **Physical Composition of Solid Waste in RCC**

In RCC, the major portion (79% to 85%) of solid waste in residential areas and market areas of RCC is compostable. The average percentage of compostable waste in residential areas is 82.47%, non-compostable waste is 13.93% and ash content is 3.60%. On the other hand, similar composition for market areas is 84.77%, 7.02% and 8.21%, respectively. The large quantity of degradable organic contents indicates the necessity for frequent collection and removal. This also indicates the potential of recycling of organic waste for resource recovery. Table 2 shows the data.

**Table 2: Physical Composition of Solid Waste in RCC**

<b>Components</b>	<b>Household (%)</b>	<b>Market (%)</b>	<b>Landfill Site (%)</b>
Vegetable, Food	82.05	83.65	79.4
Bones, Fishbone	0.27	0.13	0.37
Paper	4.40	1.23	2.30
Plastic	6.63	1.98	3.53
Textile, Rags, Jute	1.50	2.55	2.20
Glass	0.51	0.40	0.00
Leather, Rubber	0.22	0.20	0.85
Metals	0.00	0.13	0.00
Ceramic	0.33	0.38	0.39
Soil, Ash	3.60	8.21	10.51
Grass, Creepers, Herbs, Wood	0.42	1.12	0.45
Medicine, Chemical	0.07	0.00	0.00
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>
Compostable	82.47	84.77	79.85
Non-compostable	13.93	7.02	9.64
Ash content	3.60	8.21	10.51

Source: Bangladesh Municipal Development Fund, 2012: 43

### **5.0 Policies Related to Urban Solid Waste Management in Bangladesh**

Presently, there is no separate law and policy or handling rules for the solid waste management in the country including RCC. The following rules and regulations have direct or indirect relation with urban solid waste management in Bangladesh.

The National Environmental Policy 1992 prescribes that wastage of raw materials in industries will be rationally controlled and their sustainable use will be undertaken (The National Environment Policy, 1992: Article 3.1.5). The rivers, canals, ponds, lakes, haors, baors and all other water bodies and water resources will be kept free from pollution (The National Environment Policy, 1992: Article 3.5.5).

According to the National Environment Management Action Plan (NEMAP), encourages recycling to reduce waste. It prohibits waste discharge in rivers, canals and all other water bodies from industries. Open trucks will not be allowed to collect transport or dump

garbage during the day time in urban areas. Necessary steps will be taken to protect the environment and public health from the adverse impact of all sorts of waste materials.

The Bangladesh Environment Conservation Act (BECA), 1995 stipulates that Government, by rules, can control hazardous waste generation, processing, storing, loading, supplying, transporting, import, export, disposal, dumping, etc. with a view to preventing environmental damage (The Bangladesh Environment Conservation Act, 1995: Section 6.c). Violation of this section will be penalized either a fine of tk. 2 lac for first offence, or an imprisonment not exceeding 2 years, or both; in case of second offence not exceeding tk. 2 lac and in case of each subsequent offence, an imprisonment not exceeding 2 years or fine not exceeding tk.10 lac or both.

According to the Environment Conservation Rules (ECR), 1997, land filling by industrial, household and commercial wastes is classified as “Red Category,” which includes most harmful or dangerous industrial units and projects (The Bangladesh Environment Conservation Rules, 1997: Rule 7.1).

The Local Government (City Corporation) Act, 2009 provides some Clauses/Sub-Clauses that are relevant to urban solid waste management.

- The Corporation shall be responsible for the sanitation of the city, and for this purpose, it may cause such measures to be taken as are required by or under this Act (The Local Government (City Corporation) Act, 2009: Article 1.1).
- The Corporation shall make adequate arrangements for the removal of refuse from all public streets, public latrines, urinals, drains, and all buildings and land vested in the Corporation, and for the collection and proper disposal of such refuse (Ibid: Article 1.4).
- The occupiers of all other buildings and lands within the Corporation shall be responsible for the removal of refuses from such buildings and lands subject to the general control and supervision of the Corporation (Ibid.: Article 1.5).
- The Corporation may cause public dustbins or other suitable receptacles to be provided at suitable places and where such dustbins or receptacles are provided, the Corporation may, by public notice, require that all refuse accumulating in any premises or land shall be deposited by the owner or occupier of such premises or land in such dustbins or receptacles (Ibid.: Article 1.6).
- All of the refuses removed and collected by the staff of the Corporation or under their control and supervision and all refuse deposited in the dustbins and other receptacles provided by the Corporation shall be the property of the Corporation (Ibid.: Article 1.7).
- The Corporation may, if so required by the government shall provide sufficient number and in proper situation of latrine and urinal separate for each sex in the city (Ibid.: Article 1.8). The Corporation will ensure the cleanliness of public privy and urinals, and ensure the private ones are cleaned and operated in order (Ibid.).
- Subject to any law for the time being in force, the Corporation will provide an adequate system of public drains in the city area and all such drains will be constructed, maintained, kept cleared and emptied with due regard to the health and convenience of the public (Ibid.: Article 8.7).

- Subject to any law for the time being in force, the Corporation may establish and maintain public markets, and secure the proper management of such markets (Ibid.: Article 12.1).
- The Corporation shall provide and maintain at such site or sites within or without the limits of the city as the government may approve one or more slaughterhouses for the slaughter of animals or of specified description of animals (Ibid.: Article 14).
- The Corporation shall provide and maintain such streets and other means of public communication as may be necessary for the comfort and the convenience of the inhabitants of the city and of the visitors thereon (Ibid.: Article 18.1). The Corporation shall take such measures as may be necessary for the watering of public streets for the comfort and the convenience of the public, and may, for this purpose, maintain such vehicles, staff, and other apparatus as may be necessary (Ibid.: Article 18.14).
- The Corporation shall, at its first meeting, in each year, or as soon as may be at any meeting subsequent thereto, constitute different Standing Committees, such as Standing Committee of Waste Management, Standing Committee of Environmental Development, Standing Committee of Disaster Management, etc (Ibid.: Article 50.1).

## **6.0 Practices of Solid Waste Management Policies**

Data have been collected from the respondents to assess the extent to which RCC complies with government policies in managing its solid waste. Findings have been presented below.

### **6.1 Sufficiency of Solid Waste Disposal Site**

It is duty of the Corporation to make adequate arrangements for the removal of refuse from all public streets, public latrines, urinals, drains, and all buildings and land vested in the Corporation. However, the data reveals that 76.1 % of respondents believe that waste disposal places are not sufficient in RCC and only 23.9 % have replied that they have sufficient waste disposal place or tip near their house.

On this matter, RCC officials said that they are trying to make RCC a tip-free city. RCC has introduced a door-to-door collection system. RCC cleaners collect waste from households or residential buildings. Small bins are kept at various points for disposal of waste from shops and restaurants of RCC. Yet these bins are not sufficient for the high amount of waste generated from shops, hotels, restaurants, and other commercial activities.

### **6.2 Rate of Solid Waste Collection from Households by RCC**

It is duty of the Corporation to collect and dispose of refuse from the area under its jurisdiction. So, respondents have been asked how many days in a week RCC cleaners collect waste from households. As shown in Table 3, most of the stakeholders have reported that RCC cleaners collect waste from households every day (67.8%), only 32.2% reporting that waste is collected irregularly (32.2%). On the other hand, 100% of field staff stated that RCC cleaners collect household wastes every day.

**Table 3: Solid Waste Collection Rate by RCC Cleaners**

Variables		Frequency (%)	
		Stakeholders	Field Staff
RCC cleaners collect household waste	Every day	122 (67.8%)	124 (100.00%)
	Irregular	58 (32.2%)	00 (0.0%)

Source: Field Survey

### 6.3 Household Solid Waste Disposal Place

Proper disposal of household waste is the key to develop public health and to control environmental pollution of the surrounding area. 320 respondents have been interviewed in this regard. They had the option of putting tick marks on more than one option if they thought it necessary.

The highest number, 77.19 % of respondents report that inhabitants give their household wastes to the RCC cleaners, household wastes are discharged in the adjacent drains (39.06 %), and wastes are thrown in the open place or roadsides (57.5 %). 18.75 %, 5.0 % and 5.94 % respondents state that inhabitants dispose of their household wastes in the tips, water bodies, and on their own land, respectively (Table 4). An important finding is that most of the RCC inhabitants have a lack of consciousness about the proper disposal of their household wastes.

**Table 4: Household Waste Disposal Habit of RCC Inhabitants**

Variables		Frequency (%)	
Where do RCC inhabitants discharge their household waste? (Please select more than one option if you think necessary).	RCC cleaners are given	247	77.19%
	Disposal in the adjacent drains	125	39.06%
	Disposal in the open place/roadsides	184	57.5%
	Disposal in the dustbin/RCC specified area	60	18.75%
	Disposal in the water bodies	16	5.0%
	Disposal in own land/ditch	19	5.94%

Source: Field Survey

### 6.4 Vehicles Used in Solid Waste Transportation

Domestic wastes, collected by the RCC cleaners, are accumulated at the 19 secondary points of RCC with the help of rickshaw vans. The cleaners collect household waste generally in the afternoon and accumulate them at the secondary points before evening. From the secondary points, wastes are carried to the final disposal site at night in vehicles. In interviews, 71.6 % of stakeholders have replied that wastes are carried to the final disposal site from the secondary points through open truck or trolley. 20.6 % reported that covered trucks or trolleys are used during disposal of wastes from the secondary points to final disposal sites. 7.8 % do not have any knowledge about this matter.

89.5 % of field staff state that wastes from the secondary points are carried in covered vehicles. 10.5 % do not agree. Actually, physical observation reveals that RCC does not use any covered vehicles to carry solid wastes from the secondary points to final disposal sites.

### **6.5 Rate of Cleaning of Solid Waste Disposal Sites**

RCC still has more than 1,200 open tips, along with 18 secondary points, where primary wastes are accumulated. Respondents were asked whether these dustbins or secondary points whether produce stench. 51.1 (31.7 + 19.4) % respondents replies that their nearby waste disposal places are not cleaned regularly. Thus, they spread offensive odors and pollute the environment. 38.3 % state the opposite. 10.6 % give no answer. However, observation showed that, although all the secondary points are cleaned regularly, tips are done on irregular basis: these may become air pollutants.

### **6.6 Sweeping of Roads**

It is the responsibility of the City Corporation to clean public streets for the comfort and convenient of the inhabitants of the city. Analysis of data shows (Table 5) that most of the respondents (53.3%) from stakeholders agree that RCC sweepers clean their nearby roads regularly with 22.3 % dissenting. Yet 24.4 % opine that their adjacent roads are never swept by the RCC sweepers.

Again, the views of field staff are somewhat different from those of stakeholders. The vast majority (91.9 %) of field staff report that the rate of sweeping of RCC roads is regular and only 8.1 % have the opposite view.

**Table 5: Rate of Sweeping of Adjacent Roads**

Variables		Frequency (%)	
		Stakeholders	Field Staff
Rate of sweeping of adjacent roads	Regular	96 (53.3%)	114 (91.9%)
	Irregular	40 (22.3%)	10 (8.1%)
	Never swept	44 (24.4%)	0.0 (00%)
Removal of swept wastes from the road	Regular	71 (39.4%)	124(100%)
	Irregular	109 (60.6%)	0.0 (00%)

Source: Field Survey

Regarding removal of swept wastes from the roads, 39.4 % of stakeholders and 100 % of field staff have reported that swept wastes are removed regularly from the roads. But 60.6 % of stakeholders have not agreed with them. Physical observation reveals that RCC sweepers generally do the sweeping work at night. They usually sweep important and busy roads regularly. Less important roads are cleaned very irregularly. It is true that many roads are never swept by the RCC cleaners.

During sweeping, wastes are accumulated place to place. Although the swept wastes are removed quickly from the roads, these wastes are often thrown or disposed along the roadsides or used for filling up nearby water bodies or low lands.

## **6.7 Sufficiency of Solid Waste Management Materials in RCC**

The City Corporation is responsible to provide sufficient materials for the proper management of solid waste of the city. RCC staff state that they provide many vehicles to manage solid waste, including: 8 tractors, 16 Lorries, 2 hydraulic trucks, 216 rickshaws, etc. Respondents have been asked about the sufficiency of these materials. 71.38 % of them think that the materials used in waste management of RCC are sufficient. 28.62 % disagree.

## **6.8 Usage of Safety Materials by the Conservancy Workers**

It is the responsibility of the City Corporation to supply health risk-reducing materials, like uniform, gumboots, masks, hand gloves, etc. for its conservancy workers. When they were interviewed, the largest number of respondents in both categories (67.2% of stakeholders and 71.0% of field staff) report that RCC workers do not use safety materials while performing their waste management activities. Only 12.2% and 18.5% of respondents from stakeholders and field staff, respectively, disagree. The remainders do not have any knowledge about this.

During physical observation, it was found that conservancy workers do not use these materials while cleaning or sweeping roads, drains, tips, etc. In an interview, the RCCs' CEO replied that the Corporation provides health risk-reducing materials, sufficient training and necessary treatment for their conservancy workers. Yet the workers may not use these safety materials because of their limited knowledge and awareness. Many workers do not participate in the training sessions, giving false excuses. RCC do not take any punitive measures for such workers.

## **6.9 Dumping of Solid Waste into Drains and Collection**

Observation showed that most of the RCC drains contain lots of solid waste. In some cases, drains fill up and become clogged due to unlimited dumping of solid wastes over the years. When they (both stakeholders and field staff) are asked, 71.05% of respondents report that people dump solid wastes into drains, with 28.95% replying in the negative. RCC cleaners do not collect these solid wastes from drains on regular basis. 82.24% of respondents say that, when cleaners clean the drains, collected wastes from drains are dumped in the street, which is one of the causes for environment pollution and health hazard (Table 6). Especially, on rainy days, the dumped wastes in streets are spread over the roads and create a disgusting situation for the inhabitants and vehicles. Indeed, field observation confirms that wastes collected from drains are often kept in streets to dry, as RCC lacks proper waste management logistics.

**Table 6: Dumping of Solid Waste into Drains and Storage on Streets**

Variables		Frequency (%)
Do the people of RCC dump solid waste into drains?	Yes	216 (71.05%)
	No	88 (28.95%)
Are the collected wastes from drains kept on streets to dry?	Yes	250 (82.24%)
	No	54 (17.76%)

Source: Field Survey

### 6.10 Cleaning of Market Waste

The City Corporation is mainly responsible for the proper environmental management of public markets. RCC has 14 markets in its jurisdiction from which a lot of solid wastes are generated every day.

Most of the respondents (75.66%) from stakeholders and field staff confirmed that RCC workers collect market wastes regularly. Only 7.24% deny this. 17.11% did not answer (Table 7). Observation indicates that lots of solid wastes are dumped into the drains that are adjacent to the markets.

**Table 7: Cleaning of Market Waste**

Variables		Frequency (%)
Rate of cleaning market waste	Regular	230 (75.66%)
	Irregular	22 (7.24%)
	Not known	52 (17.11%)

Source: Field Survey

### 6.11 Cleaning of Abattoirs

It is the responsibility of every City Corporation to provide and maintain abattoir for the slaughter of animals for food. RCC cleaners have the duty to clean wastes from these butcherries regularly.

Analysis of data shows that 56.25% of respondents (both stakeholders and field staff) think that these are cleaned regularly. Only 8.55% think that these are not cleaned regularly, with a large proportion (35.20%) of the respondents abstaining from answering. Furthermore, in an additional question, 24.01% of respondents reply that wastes of abattoirs are dumped into open places and drains, while 30.59% say no. The plurality of the respondents (45.39%) did not answer this question (Table 8). Observation found that, in most cases, butchers slay animals in open places and dispose of the animals' blood in the drains.

**Table 8: Cleaning of Abattoirs**

Variables		Frequency (%)
Rate of cleaning slaughterhouse	Regular	171 (56.25%)
	Irregular	26 (8.55%)
	No Comment	107 (35.20%)
Do you think, waste of slaughterhouses are dumped here & there or thrown into drains?	Yes	73 (24.01%)
	No	93 (30.59%)
	No Comment	138 (45.39%)

Source: Field Survey

## **6.12 Disposal of Industrial Waste**

Rajshahi is not an industrially-developed city. There are some silk industries in this city which generate chemical waste. When the respondents (both stakeholders and field staff) are interviewed about disposal of industrial waste, 39.80% report that these toxic chemical wastes of industry are dumped into the water bodies through RCC drains. Only 7.89 % deny this. Yet the majority (52.30%) did not know.

## **6.13 Disposal of Clinical Waste**

In Rajshahi, there are 80 hospitals and clinics which produce a huge amount of clinical waste. These wastes are accumulated into RCC's specified places by the clinic's own employees and RCC cleaners collect these wastes. Respondents have been asked about the extent to which RCC dispose of these clinical wastes to the tip. 31.25% of the respondents say that RCC collects these wastes regularly. Only 4.61% say that clinical wastes are collected irregularly. Yet most of the respondents (79.28%) do not have any knowledge about this matter.

## **6.14 Disposal of Hotel-Restaurant Waste**

Hotel-restaurants and different shops in RCC produce a lot of wastes every day. According to RCC rules, the owners of the hotels or shops are ordered to dispose their wastes into RCC-specified places.

In this survey question, there is an option to choose more than one answer. So, most of the respondents (80.26%) reply that these wastes are dumped into RCC-specified points, 39.14% say that these wastes are dumped beside the hotel-restaurants and shops with 36.18% reporting that wastes are dumped into open places. Only 1.32% refrains from answering (Table 9).

**Table 9: Disposal of Hotel-Restaurant Waste**

Variables		Frequency (%)
Hotel-restaurant waste disposal place (please put tick marks on more than one option if you think necessary)	Disposal into RCC specified points	244 (80.26%)
	Disposal besides the hotel-restaurant	119 (39.14%)
	Disposal into drains or water bodies	110 (36.18%)
	No Comment	4 (1.32%)

Source: Field Survey

## **6.15 Sufficiency of Manpower in Solid Waste Management**

Sufficient manpower is a must for ensuring effectiveness and efficiency in solid waste management services. When they are interviewed, 55.6%/ of respondents from stakeholders and 38.7% from field staff agree with the statement that there is insufficient manpower to collect and dispose of refuse for the RCC. 44.4% of the stakeholders and 61.3% of the field staff opine that there is sufficient manpower.

From informal discussion with the stakeholders, it appears that, in many cases, Ward Commissioners use Conservancy manpower as personal servants, taking them away from

waste management. Furthermore, stakeholders state that a large number of sweepers, backed by a section of RCC officials, illegally draw salaries without any work (Ali, 2010).

This could explain the discrepancy between stakeholders and RCC staff answers to the sufficiency of waste management staff. There may be enough staff on the roll, which is what RCC officials see. However, in reality, many of these staff are not working on waste management, which is what the stakeholders see.

#### **6.16 Usage of Technological Instruments in Solid Waste Management**

Using technological instruments in collecting and disposing of refuse can facilitate quality service delivery, as well as a healthy environment. In this regard, 70.71% of the respondents (from stakeholders, field staff, executives and public representatives) go with statement that RCC does not use any technological instruments in collecting and disposing of refuse. 17.5% go against the statement. Only 12.19% of the respondents refrain from answering.

#### **6.17 Monitoring of Solid Waste Management Services**

An effective monitoring system helps to identify problems and, thereby, takes measures to ensure quality of the services. 44.06% of the respondents (stakeholders, field staff, executives and public representatives) report that there is no monitoring in the waste management activities of RCC. 15.31% are unwilling to answer. On the other hand, 40.63% think that there is a monitoring system in the waste management activities of RCC (Table 10).

Those who say 'no' to the previous question are asked a further question. Among them 85.11% report that a weak monitoring system impedes pollution control. 10.64% of the respondents do not report the same. Only 4.26% of respondents refrain from answering.

**Table 10: Monitoring of Solid Waste Management Services**

Variables		Frequency (%)
Does RCC regularly monitor the solid waste management activities?	Yes	130 (40.63%)
	No	141 (44.06%)
	No Comment	49 (15.31%)
Do you think that weak monitoring system impedes pollution control?	Yes	120 (85.11%)
	No	15 (10.64%)
	No Comment	6 (4.26%)

Source: Field Survey

#### **6.18 Punitive Actions Against the Environment Polluters**

RCC has a Magistracy Department, headed by a Magistrate, whose main responsibility is to conduct mobile courts and monitor the environmental situation in RCC's jurisdiction. In accordance with the legal framework, particularly Bangladesh Environmental Conservation

Act 1995, he is charged with imposing penalties, including fines and filing cases against the persons who are responsible for polluting the environment.

But when they (both stakeholders and field staff) are interviewed about this matter, only 1.32% report that RCC takes punitive actions against the polluters. The vast majority of the respondents (78.29%) say that RCC does not take any action against the environmental polluters. 20.39% of respondents do not answer in this regard. In some cases, RCC serves only a notice to the criminal, threatening him/her with future punishment. It is very rare to find any example of the RCC Magistracy giving punishment to the environmental polluters.

### **6.19 Financial Capability of the RCC**

The most important part of the total management of a City Corporation is finance. Inadequate collection of tax, fees, rates and tolls, as well as insufficient government grants, results in weak management capacity and thereby in poor service delivery. Therefore, it is essential to know whether or not the RCC has a financial crisis.

To that end, data have been collected from 16 members of RCC, 10 of whom are officers and 6 are Councilors. All the respondents (100%) clearly opine that there is a financial crisis in RCC. In response to a relevant supplementary question, 66.88% of the respondents think that lack of finance hampers the quality of services of solid waste management. 18.75% do not think so. Only 14.37% do not comment in this regard (Table 11).

**Table 11: Financial Capability of RCC**

Variables		Frequency (%)
Do you think that there is financial crisis in the RCC?	Yes	16 (100%)
	No	00 (00%)
	No Comment	00 (00%)
Do you think that lack of finance hampers solid waste management services?	Yes	214 (66.88%)
	No	60 (18.75%)
	No Comment	46 (14.37%)

Source: Field Survey

## **7.0 Conclusions and Recommendations**

Rajshahi City is one of the largest cities in Bangladesh. About 800,000 people live in this city and its area is 96.72 sq. kilometres. Its solid waste management problems and shortcomings are a microcosm for the urban sector of the nation. Solid waste management is organized and run by three Departments. The Conservancy Division is the most focused of the three on waste management yet it has no power to lead the other Departments: each goes its own way. Primary and secondary collection overlap and there is no overall strategy. Resources are inadequate. Management requires planning, control and evaluation: so there is no solid waste management in RCC, only collection and dumping. This city

everyday produces about 350 ton solid waste. RCC collects only 230 tons per day. The rest is informally dumped in open tips, drains and on roadsides. The people of Rajshahi are living in it. RCC has no policy to deal with the part it collects: no composting, no recycling, no incineration, no burial, no sanitary landfill. It is dumped next to a cattle market, leaching into ground water and spreading disease and stench to 4 communities. Impoverished women and children scavenge in it to sell recyclable materials, picking up disease as they go.

Among the solid waste, 82.36% is compostable and 17.64% is non-compostable waste. RCC does not have any composting facilities, so it is wasting its waste. Primary collection is done by the RCC cleaners through house-to-house collection system at 175Tk per day with no permanent appointments and from the small movable tips at different points in the city. Secondary collection is also done by the RCC staff at night from 19 secondary collection points of the city. Open vehicles like rickshaw vans, trucks, trailers, lorries, etc. are used for transportation of waste at all levels. The final disposal of solid waste is done by RCC through crude open dumping in the landfill site. Nawdapara is the only landfill site in the RCC. It is the opposite of sanitary. The study reveals that hazardous and non-hazardous, organic and non-organic wastes are not separated in RCC. All the clinical wastes are disposed in the landfill site along with hazardous waste from other sources like industries, slaughterhouses, households and agriculture. The study finds non-cooperative attitude of people in keeping their surroundings clean and in collecting and disposing of their refuse. The drains, roads, etc. are often seem as their rubbish bins, dumping grounds and sometimes public toilets. RCC does not take any punitive measures against the polluters. RCC does not have any effective awareness-building program. RCC has made an issue of waste management in the past but the actions taken were mostly for show, to disguise the problem: the policy was the infantile concept of “what you don’t see can’t hurt you”.

However, to protect the environment of RCC from pollution by solid waste, strong governance is required. A few well-thought-out strategies could make Rajshahi as clean and green as it believes itself to be.

- A Solid Waste Management Department with consolidated powers, permanent employees with the conditions of all City staff, and its own Magistracy, as well as a budget for public awareness, is needed.
- At least one (and probably many) sanitary landfill is required. Central government should allocate resources for this department in Rajshahi and all urban centers.
- The Department needs a clear mission, vision and power to protect the environment in every act of the Corporation. It should have a strategy for separating and recycling most waste at collection points.
- An Environmental Magistracy and Environmental Police Force should be included under the Council to provide the constant, systematic, monitoring and enforcement of waste management laws which is missing now.
- Training should be mandatory so workers handling hazardous substances wear proper equipment: including dismissal of temporary employees who do not.

- The Corporation needs a capacity building scheme for its officials dealing with the environment including solid waste management and for Rajshahi people as a whole. Awareness-raising, training, and political leadership on the issue should all be included.

### **Acknowledgement:**

I acknowledge my profound gratitude to my PhD thesis supervisor, Prof. Dr. S. M. Akram Ullah, Department of Political Science, University of Rajshahi, Bangladesh for his intellectual guidance, cooperation and continuous encouragement throughout the progress of the research, as well as to other faculty members of the University's IBS (Institute of Bangladesh Studies). I also want to acknowledge the inspiration of the outstanding researchers at the University of Victoria, Canada, where I did my PhD internship, and to Dr. Jack Edward Effron for his ideas and work to keep the paper at international standard.

I would like to give special thanks to the IBS, Social Science Research Council of the Ministry of Planning, Climate Change Unit of the Ministry of Environment and Forest, University Grants Commission, and Canadian International Development Agency for providing me substantial support in fellowship and research grants.

### **References:**

- Ali, Anwar (2010). "Faulty Solid Waste Management in Rajshahi City", The Daily Star, February 11, 2010.
- Bangladesh Municipal Development Fund, 2012. *Study on Municipal Solid Waste Management*, [http://www.bmdf-bd.org/images/frontImages/gallery/SPA\\_Picture/MSWMFinalReport.pdf](http://www.bmdf-bd.org/images/frontImages/gallery/SPA_Picture/MSWMFinalReport.pdf). Retrieved on June 30, 2014.
- Enayetullah, Iftikhar. et al. 2005. *Urban Solid Waste Management Scenario of Bangladesh: Problems and Prospects*, Waste Concern, [http://www.wasteconcern.org/Publication/Waste%20 Survey\\_05.pdf](http://www.wasteconcern.org/Publication/Waste%20Survey_05.pdf). Retrieved on July 10, 2016.
- Population Census (2011). Government of the People's Republic of Bangladesh.
- The Bangladesh Environment Conservation Act, 1995. Government of the People's Republic of Bangladesh.
- The Bangladesh Environment Conservation Rules, 1997, Government of the People's Republic of Bangladesh.
- The Local government (City Corporation) Act, 2009. Government of the People's Republic of Bangladesh.
- The National Environment Policy, 1992. Government of the People's Republic of Bangladesh.