

# Managing Solid Waste of a Medium-sized City of a Developing Country: Problems and Implications

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**Abstract:** *This article first describes that the local council in Rajshahi City Corporation, Bangladesh, is trying to do to manage the solid waste problem that they have. Then this article considers what is possible, within the obvious constraints that Rajshahi City Corporation has to improve their performance on solid waste management. Finally, we consider what the world ought to be doing to help the poor majority of its population, who live in places like Rajshahi, to manage their solid waste better, for the better health, cleanliness and environmental preservation of all of the Earth's inhabitants.*

**Keywords:** Solid Waste, Waste Collection and Disposal, Recycling, Developing Countries, Rajshahi City Corporation (RCC).

## 1.0 INTRODUCTION

Solid waste management is a dirty, disgusting problem that can damage people's health and quality of life if it is not controlled. Few like to talk about it but it needs to be discussed because it is important to human life. Solid waste management is always difficult: collection, transport and disposal are difficult to organize and integrate. At the level of even a small community, one is dealing with literally millions of kilograms of the stuff. It is difficult for a rich gated community in California or even a small, neat, mostly-recycling Scandinavian farm village. Yet the difficulties multiply exponentially when it is a medium-sized city of almost 1,000,000 people in a developing country, perhaps half of whom are poor and living hand-to-mouth on various types of livelihood. There are more of the same problems but it lacks the technology; it lacks the capital to create modern waste disposal and recycling systems; it lacks the equipment to move the waste around in a clean and efficient way; it lacks the community consciousness on the issue that would lead people not to throw paper, plastic, food waste or even human waste on to any open square meter of land or water that they can reach, let alone push for better public policy on the issue, etc that the fellow humans in the rich part of the world can use to manage similar problems better than one does.

This section introduces the solid waste management policy and issues in a medium-sized city in a developing country in a "snapshot" format. The purpose is to accustom the reader to the context in which the "hard" data arises, to understand that solving these problems is not merely a matter of changing the numerical output. The objectives of this study are: (a) to understand Rajshahi City Corporation (RCC)'s structure and policy for managing its solid waste disposal and how they function in practice; (b) to identify problems and shortcomings in the Rajshahi City Corporation's management of solid waste disposal; (c) to propose workable improvements in the management of solid waste disposal in Rajshahi City; and (d) to consider the implications of the problems discovered here for other urban centers in developing countries

## 1.1 RAJSHAHI CITY

Rajshahi is a growing city of about 800,000 people in the northwest corner of Bangladesh, across the Ganges River from India and about 3 hours' drive from India on its side of the river. It was given City Corporation status in 1987 [1]. Although the environment of Rajshahi is comparatively clean, as there is little industry to produce air or water pollution and few cars, the city historically has problems with open sewers, dumping of building materials along public roads, rubbish disposal in open tips, pollution of ponds by sewerage and by improper use of ponds as washing sites for people, clothes and animals. There is little fresh potable water available: the city water supply, built by the British over 100 years earlier, is contaminated by breaks in the pipes and rusting of the pipes. Most people rely on "tube wells": deep wells sunk to tap the natural underground water supply and powered by human pumping (for drinking water).

Before 2010, most transport was by pedal rickshaw. Since then, what people call "auto-rickshaw", which can best be described as a motorcycle, powered by an electric battery, hauling a 4-seater open "car", has become king of the roads. The pedal rickshaws are still there for short or special trips, trying to act as taxicabs without meters. Transport of goods is mainly by pedal-powered "vans": virtually platforms on wheels. Sometimes these are powered by horses or buffaloes. Buses and trains are used only for intercity transport. There are few fossil-fueled vehicles like cars and air conditioned vans. So, on balance, transport is mostly environmentally friendly.

Rajshahi residents' main form of income is from government. As a Divisional city (capital of a local region), it is a regional headquarters for police, Army, hospitals, Universities, Colleges and almost all government departments. Most people work in these headquarters or their associated Ministries or organizations. "Contracting", meaning individuals carrying out public works contracts by subcontracting the work of tradesmen, materials suppliers, etc. (taking a percentage of the total expenditure under the

contract) is one of the most profitable businesses. With the rise in the price of land, housing construction is a major industry. Many banks and insurance companies have their regional headquarters here, providing some employment: (in the case of the banks, highly-sought-after). Many homeowners make money by letting their premises to University and College students for “messes” (student accommodation). There are many small shopkeepers and tradesmen. The only major industry, other than the banks, is the silk industry: a shadow of its former self under the British, when “Rajshahi silk” was known throughout the world. Now silk consists of a handful of factories in the Sopura district, not considered as a major source of employment.

Note that Rajshahi employment is mostly in pollution-free service-based industries: but even the silk industry is totally environmentally-friendly. There are no noxious emissions to air or water. Rajshahi air smells sweet, freshened by a plethora of tree-based and plant-based flowers.

### 1.2 RCC’s MANAGEMENT STRUCTURE FOR SOLID WASTE

Urban solid waste management is not well organized in Bangladesh. As in most of the City Corporations in Bangladesh, there is no separate department for solid waste management in the RCC [2]. Three “sections” of RCC are mainly mandated for solid waste management: Conservancy, Transport, and the Mechanical Division of the Engineering Department. However, there is no clear identification of roles/functions of these departments in the legal framework.

The organizational structure of solid waste management of RCC, at least between the Mechanical Engineering and Conservancy sections, with some illustrative responsibilities, is shown in Figure 1.

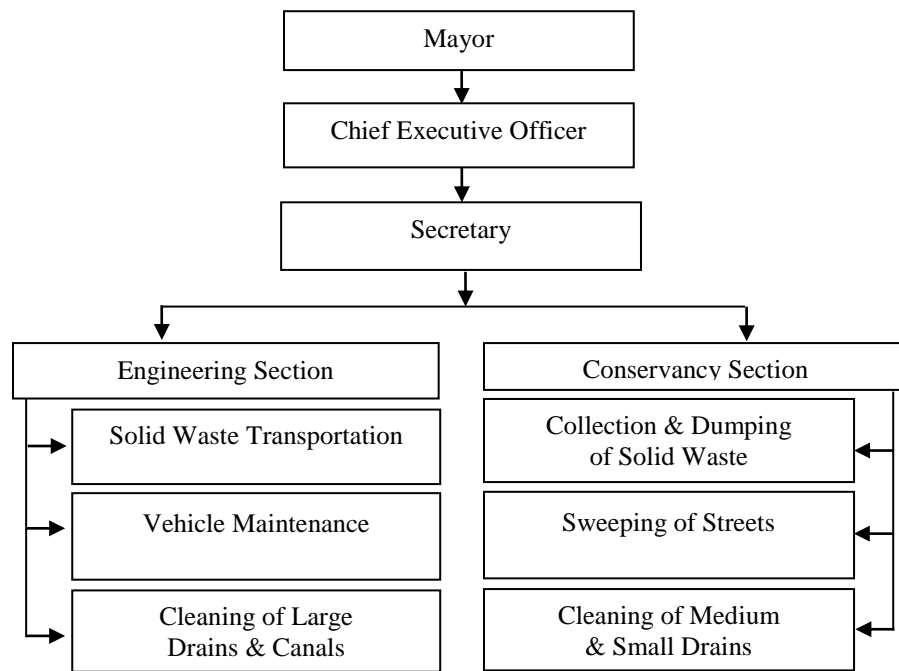


Fig. 1. Organizational Structure of Solid Waste Management of RCC

### 2.0 METHODOLOGY

Both qualitative and quantitative data have been used in this research. Primary sources include field studies, questionnaire respondents, general review of the solid waste management activities, government rules and policies, etc. Secondary sources that have been used in this research are various research reports and articles, official statistics, relevant books, unpublished study documents, reports, theses/dissertations, daily newspapers, websites, etc. In-depth interview, focus group discussion and observation were used to discover the actual use of environmental law and policy in practice. Data were collected from local government officials and field staff involved in implementing environmental law and policy, as well as non-governmental stakeholders from the communities, such as residents and civil society members.

The study has been conducted on the RCC. It has been selected purposively among the eleven City Corporations in Bangladesh for the following reasons.

Firstly, RCC is the fourth largest city of Bangladesh with a semi-cosmopolitan nature. It is the largest city in Northern Bangladesh and has resemblance with other regional centers. The capital, Dhaka, has now turned into a mega-city and, as such,

may no longer represent typical urban Bangladesh. Therefore, Rajshahi is more representative of urban governance problems and issues in Bangladesh than Dhaka.

Secondly, all the City Corporations of Bangladesh are now functioning under the same Act, “Local Government (City Corporations) Act, 2009.” The environmental activities of all the City Corporations are almost identical. Other rules and circulars are also same and promulgated by the Local Government Division of the Ministry of Local Government and Rural Development (LGRD). Principal sources of funds for development activities of all City Corporations are the allocations from the Ministry and the same donor agencies that stipulate the same guidelines for environmental compliance by all local governments. The research on the RCC thus may be considered as representative of all the City Corporations in Bangladesh.

### 3.0 RESULTS

#### 3.1 The Road System – Keeping It Clean

Recently, RCC has introduced a mechanical road sweeping machine which can sweep 10-15 km of main road per hour. According to the RCC, introduction of road sweeping machines would cost Tk. 25 for cleaning 1 km of road. Compare this to the fact that the human sweepers are paid 150Tk per day and can sweep about 1km per day.

RCC sweepers dispose the human *excreta* from pit latrines or septic tanks through manual methods. They usually sweep important and busy roads regularly. Roads considered “less important” are cleaned very irregularly. It is true that many roads are never swept by the RCC cleaners.

When cleaners clean the drains (sewers), collected wastes from drains are dumped in the street, which is one of the causes for environment pollution and health hazard. Especially, on rainy days, the dumped wastes in streets 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 to remove them anywhere.

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.

Most of the sweepers and cleaners are hired on temporary contracts. Their salaries are trivial, their education and training almost zero (they boycott the training sessions) and they refuse to wear any protective clothing, even though this is provided by the Corporation. 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 [3].

#### 3.2 The Rubbish Assembly Line

- (1) the present system encourages multiple handling of solid waste before disposal:
  - i) from household to rickshaw van;
  - ii) from rickshaw van to open area
  - iii) from open area to demountable container/open bin;
  - iv) from open bin to truck;
  - v) from truck to landfill.
- (2) the households dump their rubbish in open places, roadsides, water bodies or into the drains, which slows down the collection rate.
- (3) since solid waste collection vehicles at every stage, rickshaw-van, truck, lorry, etc., are open, these vehicles create environmental hazards during haulage of solid waste.
- (4) rickshaw-van-collected solid wastes are unloaded, not in the community tip, but near the tip, in the open, which creates hazards for the environment, as well as for the pedestrians and vehicles.
- (5) the secondary collections are sometimes obstructed because of construction materials at the roadside and people do not cooperate in this regard.

#### 3.3 Rajshahi’s Rubbish Hills and Mountain

There are about 118 km *paka* (Bengali: “ripe”, meaning concrete) drains (meaning sewers) and 162 km *katcha* (Bengali: “unripe”, meaning soil trench) drains in the City Corporation. RCC has 1200 open tips and an open landfill site located at Tikhor Vagar.

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Tikhor Vagar's nearest residential area is about 3 km away. The total area of this disposal site is 16 acres. Over the years, a cattle market has been developed in this area. At present, the market has occupied around 3 acres of the disposal site, while the rest (13 acres) is being used for disposal of waste.

No environmental or social impact assessment was done in selection of the Tikhor Vagar site as a disposal site. Prior to the selection of the site, no environmental clearance or site clearance from the Department of the Environment was obtained (as required by the Bangladesh Environmental Conservation Act 1995, Section 12) and no environmental or social impact assessment was carried out. In principle, social impact assessment should be carried out and the opinions of the surrounding community people, up to several kilometers, should be taken before creating a landfill site [4].

No excavator or pay loader is available for landfill operation in this site. There is only one chain bulldozer, which is used twice in a week.

- Four cleaners and one heavy equipment operator are working at the disposal site. One person, as inspector or supervisor of landfill, also works sometimes.
- No underground or subsurface perforated piping has been installed to collect, transport and treat the leachate. Neither has any leachate pond been constructed [5].
- Every day, a waste collection vehicle disposes of the waste at the landfill site, anywhere they find it comfortable to discharge and easy to access. No dumping platform has been constructed. They use their common sense to find a rational place for disposal. Usually, they try to follow the previous day's waste dumping places.

Waste pickers are usually found working at the disposal site to collect recyclables like, cans, paper, plastic, rubber, tire, glass, GI wire, iron, pet bottle, tin etc. Most of them are children and women. There is no monitoring of waste picking and quantity of recyclables recovered: this is their private source of livelihood. Waste pickers face many hazards such as;

- Sharp materials cause injury and infection;
- Infections between fingers;
- Fever and cough are found to be the most common diseases;
- Apparently they are suffering from malnutrition;
- Absence of hand gloves and masks exposes them directly to the polluted environment, etc [6].

The physical condition of the disposal site is not environmentally sound for the following reasons [7]:

- There is no buffer zone at the existing site;
- A 3 to 4 ft high earthen embankment exists around the disposal site that sometimes causes flooding after heavy rain;
- The cattle market is within the premises of the landfill;
- Pollution of water resources near the landfill by leachate has been observed; and
- There is no fencing around the landfill site.

Each of the 19 secondary rubbish collection points across the city is a little Tikhor Vagor, with animals eating there regularly (including animals for human consumption, especially cows), but without people picking the waste. These are open tips, where street sweeping wastes and other wastes are accumulated.

### **3.4 Recycling and Composting of Waste**

RCC has a compost plant with 2 tons/day capacity. Yet the compost plant is not processing any waste: it has not been able to get the license from the Department of Agricultural Extension (DAE) for marketing of compost.

Recycling is not possible because there are no resources for segregating waste into recyclable and non-recyclable categories. Even hospital and abattoir waste is thrown into the market and household waste, creating health hazards. The city could employ waste pickers from Tikhor Vagor to do their disgusting and dangerous job for this purpose [8], but using tax money for this purpose would not be politically popular for the Mayor or Councilors, who would be seen as exploiting the poorest of the poor.

### **3.5 Household and Market Waste Collection**

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 it

to the secondary collection points before evening. There are 1,200 movable dustbins and 216 rickshaw-vans allocated for 30 Wards.

Secondary collections take place at night, through dump trucks as per instruction of the Conservancy Inspector. RCC cleaners use baskets made of straw or bamboo, to manually load the vehicle from secondary collection points.

Every night, before collection starts, high officials of Rajshahi City Corporation arrange meetings with field staff, particularly Conservancy Officers, Supervisors and Inspectors, to ensure smooth collection of waste. Americans might call this a “garbage pep talk”. The uneducated sewer sweepers must find it quite motivating to have the city Mayor meets with them and tell them how important their work is.

### 3.6 Problems Identified By Stakeholders

Following is a summary of the problems identified in RCC’s solid waste management policy, as identified by the stakeholders of the RCC in interviews.

**Table 1:** Problems of Solid Waste Management of RCC

Variables		Percentage (%)	
		Yes	No
Problems of Solid Waste Management of RCC	Throwing of waste into drains	52.8	47.2
	Irregular disposal of waste from the dumping points	30.0	70.0
	Lack of people's cooperation	77.2	22.8
	Absence of accountability of RCC staff	50.6	49.4
	Lack of sufficient budget and manpower	28.3	71.7
	Lack of sufficient waste disposal places	76.1	23.9

[Source: Field Survey, 2019]

## 4.0 DISCUSSION

In this section, we consider the problems identified by stakeholders in the Rajshahi City Corporation’s solid waste management. Here, we can identify what improvements might be made in the City Corporation’s policies, as well as consider the implications of the problems identified here as they exist across the world in millions of similar cities in the developing countries.

### 4.1 Throwing of Waste into Drains

“Throwing of waste into drains” illustrates the dilemmas of environmental protection in the developing world. In the developed world, this is solved by covering over the sewers: putting them under the road. No one can dump in them. Yet the costs of covering over Rajshahi’s 280 km of drains would be astronomical and beyond the conception of the RCC. This illustrates how resource constraints create environmental problems in developing countries that simply do not arise in developed countries.

A previous Mayor tried to do this, by constructing beautiful colored, tile footpaths along main roads, covering many drains. Yet even then, spaces were left in the footpaths so that people could throw waste into the drains.

There must be a cultural problem here [9]: a Bangladeshi with rubbish in his hand cannot think of what to do with it until he sees an open space in the drain. So long as the drains are open, Bangladeshis will throw waste into them. They even gather waste during the day to do so under the cover of darkness: not because there is any enforced law against it that they care about but because “it looks bad”.

This illustrates that, regardless of available technology, sometimes there are cultural constraints on solid waste management in non-western countries. The “rubbish tolerance level” varies from culture to culture: it is almost zero in some countries, like New Zealand, Japan and Sweden. On the other hand, many tourists to African countries remark that the people virtually live in rubbish and it does not seem to bother them. Bangladesh is somewhere between these extremes.

#### 4.2 Lack of Popular Cooperation

On the other hand, lack of people's cooperation is an illustration of how the RCC could do much more with comparatively little investment, totally within their means. Making the people more supportive of environmental improvement is the best chance, for example, to stop them throwing rubbish into the open drains. It would also reduce other problems in solid waste disposal, like getting the people to segregate their own waste to allow recycling and disposing of their own waste properly rather than using the road as a dustbin.

Yet how does one change people's minds? A popular former Mayor got the Council to impose fines for public dumping: but no one's mind was changed and the fines were almost never imposed. The law was totally ignored.

Obviously change in people's thinking and values cannot be created by force: by writing laws with penalties. What was missing was for the popular Mayor to go to the people and campaign for the environment like he campaigned for his Party's Council candidates. Maybe strong, effective political leadership could change people's minds. It is an argument that the politicians need to win among the people.

Alternatively, one might believe that this is not a political problem but more a market development problem. Maybe the Council needs to bring professional marketers to market good environmental behavior like the marketers get people to buy new soap. As many dictators can testify, propaganda can be more powerful than Armies.

This is probably not a developing vs developed countries issue. Even developed countries could benefit from more political leadership and more professional marketing in favor of environmentally-friendly behavior. However, cultural ways of thinking about the environment may make the job tougher in developing countries. It is not just a matter of changing their behavior but changing the people's way of thinking about what a satisfactory environment means. Now they may be thinking: why shouldn't I throw that wrapping on the ground? The answer is not so simple and they may not want to hear it.

#### 4.3 Accountability Of Staff

The stakeholders were almost 50-50 on the issue of unaccountable RCC staff. There must be a problem there but maybe not a pervasive one. Further research is needed to find out who is not accountable for what: then appropriate supervision or appeal policies can be put in place to make the unaccountable officials accountable.

#### 4.4 Crisis: What Crisis?

RCC officials always tell anyone who asks that the Council are in a financial crisis and lack sufficient manpower and resources. Yet the stakeholders do not believe it: 70% say that there is no shortage of budget or manpower. They must see a lot of waste, like the ghost sweepers who collect salary but never sweep, with political protection. So, some auditing and supervision is needed to assure that moneys are being spent properly, so that money is available for important environmental action and not just becoming solid waste itself!

This is also an issue in many developing countries. Like poverty, health care and other "*causas buenas*" the environment can attract a lot of money from well-intentioned donors and make a lot of money for badly-intentioned corrupt officials. Auditing and financial control is a very important part of good environmental governance in any country.

#### 4.5 Insufficient Waste Disposal Sites

An even larger percentage (76%) of stakeholders complained that waste disposal sites were insufficient: this is an understatement. Tikhov Vagor and the 19 stinking secondary waste disposal sites (with walls around total Hell) should be shut down. Many more, smaller, waste disposal sites, in more places, more accessible by community residents, must be better [10]. Such a policy would also shut down the "rubbish assembly line" discussed earlier.

Best off, if the Council cannot recycle the rubbish, would be if the Council would bury it, rather than put it in a few large, stinking open tips. 20 Caterpillar earthmovers, if they could be afforded, would solve many problems: dig giant holes and push the waste in. Also, breaking the logjam over the Corporation's license for the composting plant, which is now rusting, would help make more efficient use of the large amount of plant-based market rubbish (around 79% of total rubbish in "vegetables and other food")[11].

In all developing countries, there tends to be a lack of sufficient provision for recycling, mainly because it is capital-intensive and requires consistent, inconvenient behavior that tropical people do not like to do. Here is where the world community, if they are serious about saving the Earth, could do a lot by advancing the necessary capital and technology and by developing "user-friendly" means of recycling that do not inconvenience or confuse ordinary, not-well-educated people.

### 5.0 THE WORLD'S RAJSHAHIS AND WHAT TO DO FOR THEM

As shown in the last section, Rajshahi City Corporation could make some progress in its solid waste disposal policy, even within admittedly tight constraints of finance and other forms of reality. However, they could not totally solve the problem, due to these constraints. In this regard, Rajshahi is like millions of small-to-medium-sized cities in developing countries around the world.

### 5.1 Common Problems of Solid Waste Management in Urban Centers in Developing Countries

First, we need to open our eyes to the pervasiveness of the same problems across the developing world. As Buhner remarks [12]:

If you wonder whether your geographical knowledge differs from mine, let me emphasize that it is not an exclusively Ghanaian story. It is a given that Nepal and Ghana are far away from each other. However, all the problems mentioned are replicated throughout the other countries of the global south and compost lacks popularity around the globe.

From what we have learned about Rajshahi, we can define what could be some common problems throughout such cities throughout the world:

- (1) financial constraints;
- (2) lack of available technology;
- (3) cultural problems;
- (4) lack of popular consciousness/support for environmental protection.

### 5.2 What to Do for them?

From the same study of Rajshahi and recommendations in the previous section of this paper, we can also suggest some ways for those cities to improve their solid waste situations by themselves within their own constraints:

- (1) popular education, environmental advertising/propaganda, campaigning by popular political leaders, to enhance the people's awareness of and support for environmental protection, which could also help to change the culture about waste
- (2) about waste: if you can't recycle it, bury it; don't collect it endlessly
- (3) audit use of financial and human resources devoted to solid waste collection, to eliminate waste, maximize efficiency and eliminate corruption
- (4) recycle, compost and otherwise re-use waste to the extent possible with the financial and technological resources available
- (5) design audit, hierarchy and complaint procedure so that all staff involved in solid waste disposal are fully accountable and operating at maximum honesty and efficiency.

#### 5.2.1 Begging is Not Sustainable

In considering what more might be done for such local governments, we should always bear in mind the truth found by Ogawa [13]: most "projects" to help local governments deal with solid waste were found unsustainable because the local governments lacked the resources to continue the changes without outside help. When the project was completed, the initiative collapsed. Of course, such "change" is no change at all.

So the goal should not be to bring in developing countries to give the local government some money and things: rather technology, human resources and strategy needs to be transferred in a permanent way which is sustainable for the local government to continue with its own resources.

#### 5.2.2 Creative Solutions

Then, let us be prepared to think outside the box. USAID offered this solution [14]:

Small earthworm composting farms, operated by 5-6 people, have proven more successful than traditional composting facilities, though they are not yet in widespread use. Vermiculture benefits from better quality control and the perception that the worm excrement is derived from "clean" vegetable waste, whereas compost is derived from garbage.

Finally, let us look around the world for better ideas. Some local governments in poor countries are getting some things right. Remember, the poverty which maintains all other kinds of poverty is the poverty of ideas. For example, following were the “best practices” found by Practical Nepal in their study of solid waste management in Nepal [15].

(1) minimizing solid waste at source (2) meet needs for landfill sites [16] (3) waste management as part of the initial infrastructure, meaning that, when a building is built there must be a waste management strategy (e.g. recycling facility) built into it, or it should not be built. (4) greater participation of local communities (5) support for private sector partnership (5) involve local recycling service suppliers in waste management planning (6) tax waiver for recycling enterprises (7) use composting (8) waste management needs a separate department (9) use a special local hook (in Nepali “suiro”) to take plastics out of heterogeneous waste (10) empowerment of low-income communities for recycling their own waste (11) systematic effort for financial management (12) roles and responsibilities (meaning educating stakeholders on their role and responsibility in solid waste management) (13) use interactive programs, television and radio, educational tours, exhibitions, etc to encourage users to take a greater role in solid waste management (14) honor a good waste handler, who makes outstanding contributions to resource management, with cash prizes (15) provide more solid waste management training centers [17] (16) more research and studies (17) short-term and long-term planning.

These are all, with all due respect to Practical Nepal, eminently practical suggestions, with small resource commitments, which are quite sustainable in terms of financial and resource commitment to local governments in poor countries.

Many writers on this topic refer to the “integrated and sustainable waste management” (ISWM) model put forward by Wilson, Velis and Rodic [18], based on a study of 20 cities on 6 continents in developing countries. They say that:

The priorities of good waste management, at the top of the waste hierarchy, are expressed by the ‘3Rs’ – reduce, reuse, recycle.

This is consistent with most of what has been discussed as alternatives in this paper. For the governance side of solid waste management, the ISWM emphasized inclusiveness, financial sustainability, sound institutions and proactive policy, endorsing the “new public management” strategies of accountability and service orientation to the clients’ whose waste is being managed. Again, there are strains of these themes throughout the discussion here, bearing in mind that the discussion is on a practical level and the model is theoretical. This only adds more proof of the universality of the ISWM model.

Scheinberg refers to the value of tipping fees and disposal pricing in reducing the amount of waste and encouraging recycling [19]. Certainly, this is correct theoretical economics but is also an example of why developed country solutions cannot work in the developing world [20]. There are no tipping fees in Rajshahi: the City Corporation brings all the rubbish to the tips for free because the alternative is to leave the residential areas drown in it. There are also no official fees for primary collection, although city barrow-collectors are notorious for demanding about 20Tk (US\$0.25) per month to come to one’s house. If there were fees, at all high, in this poor city, certainly no one would pay them and the rubbish would never be collected. In the west, where the money is available to pay rubbish disposal fees, people respond with the cost-minimizing behavior of having the rubbish collected but reducing the amount.

## 6.0 CONCLUSIONS

The essential learning from the experience of Rajshahi, applicable probably to any community in the developing world, can be reduced to a few common sense principles:

- i. Involve the people** – bureaucracy-made, or even politician-made, policy is probably least appropriate in environmental issues because they affect how people must live each day, so you will get a much better result if you make a space for people to participate in decisions and even require their consent for some activities.
- ii. Get rid of the waste!** - too often, solid waste management is conceived in terms of organizing the collection of the waste, transport of the waste and storage of the waste: this leads to bigger and bigger waste mountains, so recycle it, burn it or bury it.
- iii. Audit and Control** - Solid waste management is an expensive operation which can involve many people: waste can refer not only to what is being collected but also to what happens to the money and other resources, so watch what everyone is doing and make people accountable for what they do
- iv. Don’t forget your 3Rs!** – in modern times few experts conceive in terms of dumping solid waste: a complete solid waste management policy does not only conceive of carrying the waste around but includes workable policies to reduce the total amount of waste generated, to re-use valuable assets and to recycle things where possible



This strategy, consistent with and amplified in Practical Nepal's "best practices" and confirmed by the integrated sustainable waste management model of Wilson, Velis and Rodic, is what this article can contribute to the world.

Basically, do what you can within your resources, use the technology available (not forgetting traditional technologies like the Nepalis' hook), be careful to use what you have efficiently and honestly and don't wait for any rich country to give you huge capital or technology that you could not possibly continue to use with your own resources when the project finishes. Think globally but act locally, within local customs and traditions and resources available locally.

#### REFERENCES:

- [1] Pranab Kumar Panday, and Ishtiaq Jamil, "Policy Making in Urban Bangladesh: Whose Domination?" *Nepalese Journal of Public Policy and Governance*, Vol. xxvii, No.4, December, 2010, p. 22.
- [2] Rajshahi is, technically and under the Local Government (City Corporation) Act 2009, a "City Corporation". This concept, which comes from the English Municipal Corporations Act 1835, means it has an elected Council and Mayor which makes the laws for the city. However, it is not a "city" like New York, Mexico City or Johannesburg. In Bangladesh parlance, it is spoken of as a "Divisional city", meaning a Provincial large town something like Leicester or Oxford. There is a lot of green space, there is still rice growing in large parts of it and the population is growing but not heavily concentrated. The "10 story building" (there is only one in the "city") is considered quite a wonder. It is Dhaka and to some extent Chittagong which are really "cities" in an international sense, with high population density, traffic jams, vertical building and industries.
- [3] Anwar Ali, "Faulty Solid Waste Management in Rajshahi City", *The Daily Star*, February 11, 2010.
- [4] Bangladesh Municipal Development Fund, *Study on Municipal Solid Waste Management*, (June 2012), p. 70; Available at: [http://www.bmdf-bd.org/images/frontImages/gallery/SPA\\_Picture/MSWMFinal Report.pdf](http://www.bmdf-bd.org/images/frontImages/gallery/SPA_Picture/MSWMFinal Report.pdf), (accessed on June 30, 2014).
- [5] *Ibid.*, p. 71.
- [6] *Ibid.*, p. 72, and Field Survey.
- [7] *Ibid.* and Field Survey.
- [8] As Ogawa, H., Sustainable Solid Waste Management in Developing Countries" **Error! Hyperlink reference not valid.**, accessed 16. 5.16, presented at the 7<sup>th</sup> ISWA International Congress and Exhibition, Parallel Session 7, "International Perspective", "Buhner, M., "Three Alternative Ideas For Waste Management In Developing Countries", **Error! Hyperlink reference not valid.**, accessed 16 May 2016 and Diaz, L., Solid Waste Management in Developing Countries: Status, Perspectives and Capacity Building , Intergovernmental Preparatory Meeting for CSD-19 United Nations Headquarters New York, USA -- March 3, 2011, p. 23 suggest. Wilson, D., Velis, C. and Rodic, L., "Integrated Sustainable Waste Management In Developing Countries" (2012) 166 (WR2) Waste and Resource Management (Proceedings of the Institution of Civil Engineers (ICE) Paper 1,200,005 also suggest "integrating" informal recycling done by the poor and formal recycling done by the whole community. Finally, Sharholly, M., Ahmad, M., Mahmood, M., and Trivedi, R.C., "Municipal Solid Waste Management In Indian Cities" (2008) 28 *Journal of Waste Management* 459–467 refer to organizing the informal sector for recycling.
- [9] What Buhner, *ibid.* at n. 7 calls "different waste management traditions" of people coming from a recently-agricultural society where everything was bio-degradable.
- [10] Tadesse, T., Ruijs, A., and Hagos, F., "Household Waste Disposal In Mekelle City" (2008) 28 *Northern Ethiopia Journal of Waste Management* 2003 found that the supply of waste facilities significantly affects waste disposal choice.
- [11] *Ibid.* n 8, This was also found in Nepal. Practical Action Nepal, Best Practices On Solid Waste Management of Nepalese Cities (2008).
- [12] *Ibid.* See also e.g. Diaz, L., *ibid.* at n. 7, p. 2-23.
- [13] *Ibid.* n. 7.
- [14] Environmental Guidelines for the USAID Latin America and Caribbean Bureau, Chapter 5: Environmental Issues and Best Practices for Solid Waste Management, USAID, 2000
- [15] *Ibid.* n. 8, p. 49-51.
- [16] As seen in Tikhor Vagor, this can be a mixed blessing, which may not be a good final goal. Yet Practical Nepal were referring to the problem that many Nepali communities have no landfills and are dumping their waste everywhere.

- [17] Cf. Diaz, L., *ibid.* at n. 7, who puts most of his recommendations in terms of “capacity building” i.e. training, of community members (“public education”), civil servants, even elected officials.
- [18] Wilson, D., Velis, C. and Rodic, L., *ibid.* at n. 7.
- [19] Scheinberg, A., “Value Added” (2011) PhD dissertation Wageningen University (Netherlands).
- [20] Cf. C. K. Vidanaarachchi, S.T.S. Yuen, S. Pilapitiya, “Municipal Solid Waste Management In The Southern Province Of Sri Lanka” (2006) 26 *Journal of Waste Management* 920–930 (Sri Lankan households expected the local authority to collect all rubbish).

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