

## **Linking Waste Management with Banking Sector in Bangladesh: Status and Perception**

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### ***Abstract***

*Efficient waste management becomes a crucial issue for ensuring a sound environment and sustainable economic activities in Bangladesh. Throughout the entire business cycle, if waste can not treat properly in every stage, it may shrink a significant portion of the entire return. By ensuring proper waste management, it's possible to transform a large volume of waste into resources which results remarkable positive impact on environment, operating cost and business income besides ensuring employment. In this regard, banking sector among different stakeholders, may contribute a lot by implementing waste management techniques through its in-house practices and financing. The study reveals that, current status of banks in Bangladesh has received an appreciating attention in linking waste management till date and the bankers' perception in this regard needs to go far beyond to make the banking activities more acceptable and sustainable.*

**Key Words:** Environment, Sustainable, Waste, Likert scale, Reliability test.

**JEL Classification :** G21, Q53.

## 1. Introduction

Environmentally sound waste management becomes a burning issue for ensuring a sustainable environment and now-a-days it is drawing its logical impact on the overall economic activities. [Because throughout the entire business cycle, if waste is not treated properly in every stage it may eat up a significant portion of the entire return.] The public concern of the state of environment and waste management has been growing rapidly in the last few years but mainly at developed countries than developing countries like Bangladesh.

In Bangladesh, potentials and impacts of efficient waste management is massive, particularly in densely populated Dhaka city. On the way to increase the awareness at mass level in this regard, different initiatives are required to address the vital cause of the problem by attempting to change the current hazardous types of production, consumption and finally dispose of the wastage arising from the entire business chain. In offering a sustainable solution to all these patterns of economic activities, banking sector among many others, may contribute a lot through implementing diverse waste management techniques for itself and its customers.

While waste is not properly managed can causes serious health hazards or social problems in a community. It is of vital importance that waste should be managed in such a way that it does not cause any harm to either human health or to the environment. Waste management is not any longer a technological or logistics matter and the responsibility of the municipality alone rather, city residents and their behavior come increasingly into play. We need to convert the waste into energy to achieve our upcoming energy target but the entire process of managing waste to any form of resources like energy is a very costly endeavor.

Many factors play significant roles in waste generation, such as escalation urban population, economic advancement, changes in consumption pattern, adoption with changed climate, culture & institutional framework. Among these, Alamgir et al. (2005) considered urban population growth and economic development as vital factors as they not only accelerate consumption rates but also increase the generation of waste in developing countries. In Bangladesh, urbanization is occurring very rapidly and living standards are also improving at steady, particularly in Dhaka City. These transitions cause various positive impacts on overall economic development with some negative impacts also. One of those negative impacts is generation of huge volume of wastes, specially Municipal Solid Waste (MSW), which is causing severe environmental degradation.

According to Bhuiyan (1999), estimation of daily waste generation in the Dhaka City Corporation (DCC) is 3,500 tons, out of which 1,800 tons are collected and dumped at landfills, 400 tons are piled up on roadsides or open spaces, 400 tons are recycled, and the rest is illegally dumped on the way to dumpsite. The situation is much more alarming today in spite of taking a number of motivating initiatives like set-up of 'waste-bin' covering whole city.

Waste characterization studies have been carried out mostly at the disposal points, rather than at the source of waste before any recycling activities occur. In 2005, Japan International Cooperation Agency (JICA) characterizes the MSW on the basis of moisture content in MSW. It ranges from 65% to 80% for the mixed waste. Higher moisture content indicates the possibility of the development of anaerobic conditions in the disposal site that causes obnoxious odors and quicker rotting. Since the organic fraction in the waste stream is higher in quantity, composting has the more potential possibility as a waste management option (Yousuf and Rahman, 2007).

In Bangladesh, 'waste management' as part of environment friendly banking practices received a petty attention till date. Though recently, a limited number of banks have some inspiring initiatives for their in-house waste management and financing that includes recycling and reuse of used paper and equipment, financing projects to produce organic fertilizer from fruits and vegetables wastes, poultry slurry, and treatment of industry produced chemical waste, etc. Feeling responsible in this regard, Hage et al. (2009) suggested in his study that waste management should be given the highest attention in policies, programs or projects seeking behavioral change.

### ***Objectives of the Study:***

On the above background, the broad objective of the study is to examine the status and perception of banks regarding waste management as part of environmental friendly banking activities in Bangladesh. Specific objectives are: ***one***, to discuss a conceptual background of waste management; ***two***, to evaluate the existing policy and regulatory environment for developing sound waste management by Bangladesh Bank; ***three***, to examine the current status of in-house initiatives & financing and perception of banks in Bangladesh regarding waste management; and ***finally***, to put forward some recommendations for speeding up the effort of ensuring sustainable and clean environment in the country in line with the survey findings and perception analysis.

### ***Methodology:***

The study is based on both primary and secondary information. As to the secondary data, published research articles in different journals and various publications of Bangladesh

Bank and Bangladesh Institute of Bank Management (BIBM) have been consulted for preparing the paper. Primary data have been collected through questionnaire survey from the officials of the relevant desks of 21 commercial banks<sup>1</sup>. Findings of the survey results have been presented through the descriptive analysis, tables and graphs. The test of reliability of the questionnaire is conducted by using Cronbach's Alpha. Respondents have given their perceptions regarding qualitative issues on waste management on a five-level Likert scale as "1" for "Strongly disagree", "2" for "Disagree", "3" for "Neutral", "4" for "Agree" and "5" for "Strongly agree". Some success and failure cases from both supply side and demand side is also incorporated to reflect the existing and potential role of banks in designing and implementing efficient waste management techniques and mainstreaming the issue into their broader environment friendly banking activities. In spite of all these efforts, one has to be careful in generalizing the findings of the study as the review and analysis has done on the basis of sample banks.

### ***Organization of the Paper:***

The paper is organized into eight sections. After covering introduction, objectives and methodology in section one, section two and three attempts to discuss some conceptual background and literature review of waste management. Section four discusses some cross-country experiences while section five highlighted some waste management techniques and their applicability in banking sector. Section six detailed out the rules and policy initiatives of Bangladesh Government and Bangladesh Bank (BB) addressing waste management. Status and perception of banks in response to waste management in Bangladesh is reflected in section seven covering some cases of bank financing, banks' in-house practices and survey findings. Recommendations are also discussed in the same section in line with survey findings and perception analysis. Finally, section eight ended up with concluding remarks.

## **2. Conceptual Background**

Waste incorporates all items that people no longer have any use for, which they either intend to get rid of or have already discarded. Moreover, wastes are such items which people are require to discard, for example-household rubbish, sewage sludge, wastes

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<sup>1</sup>Sonali Bank Limited, Agrani Bank Limited, Uttara Bank Limited, Janata Bank Limited, Southeast Bank Limited, Prime Bank Limited, BASIC Bank Limited, BRAC Bank Limited, Bank Asia Limited, Dutch Bangla Bank Limited, Premier Bank Limited, Mutual Trust Bank Limited, Trust Bank Limited, NRB Commercial Bank Limited, NRB Global Bank Limited, Islami Bank Bangladesh Limited, First Security Islami Bank Limited, ShahjalalIslami Bank Limited, Al ArafIslamiBank Limited, EXIM Bank Limited and Citi Bank NA.

from manufacturing activities, packaging items, discarded cars, old televisions, garden waste, old paint containers, etc. All our daily activities can give rise to a large variation in different wastes arising from different sources like Municipal Waste, (including Household and Commercial), Industrial waste (including manufacturing), Hazardous Waste, Construction and Demolition Waste, Mining Waste, Waste from Electrical and Electronic Equipment (WEEE), Biodegradable Municipal Waste, Packaging Waste, End-of-Life Vehicles (ELVs) & Tyres and Agricultural Waste<sup>2</sup>. According to Medina (2008), waste is a relative concept. What is waste for one could be a resource for another. What is valueless for some could be useful for others. The richer the person, the higher the quantity of waste he or she produces. Waste management is now the serious issue addressed by the world today. Particularly it is severe in third world countries. Vollebergh (1997) also mentioned in his study that Waste-to-Energy plants are a very expensive way to save on climate change emissions. The International Expert Meetings<sup>3</sup> also focused the need to promote social and economic development through improving efficiency and sustainability in the use of resources and production processes and reduce environmental degradation, pollution and waste in 2003 and 2005.

### 3. Literature Review

Feeling responsible for managing one's waste seems to be the vital factor determining one to participate in household waste segregation and keeping the city clean, and should be given the highest attention in policies, programs or projects seeking behavioral change in this direction (Hage et al. 2009). There are a number of options available for the treatment and management of waste including prevention, minimization, re-use, recycling, energy recovery and disposal. The integrated approach, addresses for the first time the role of waste producers, as the waste problem is seen through what Clapp (2002) calls a "consumption lens". Moreno-Canchez et al. (2006) found a beneficial role of the informal waste-recyclers and emphasized the importance of integrating or organizing them into the formal waste management scheme in order to reduce their vulnerability and improve their livelihoods, working conditions and efficiency in recycling.

The urgency in managing waste properly and commercially is severe in case of countries where a significant portion of society comprises with poor or socially disadvantaged

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<sup>2</sup><http://scp.eionet.europa.eu/themes/waste>

<sup>3</sup>First International Expert Meeting in Marrakech, June 2003; and the Second Expert Meeting in San Jose, September, 2005.

people by any ways, like Bangladesh. Sinha(1995) in his study on Dhaka City Corporation (DCC) opines that, the poor and socially disadvantaged people involved in extracting recyclable materials from waste from the streets, waste bins and dump sites total more than 87,000 in number. This informal sector accounts for almost 10% of total employed workforce and is responsible for removing 26% of total generated waste in the DCC area. Waste management also causes Bangladesh a lot of budget allocation. Dhaka City Corporation's expenditure on solid waste management is 52.87% more than its income. The per capital expenditure for Solid Waste Management (SWM) in Dhaka is very low (Tk. 53) compared to other asian cities such as Bombay Tk. 304.00, Manila Tk. 192.00 and Bangkok Tk. 84.00 (Enayetullah, 1994).

#### **4. Cross-Country Experiences on Waste Management:**

Different countries of the world are managing their waste applying diverse techniques. Some of which are really appreciable while contrast scenario has also observed in some cases. A number of cross-country experiences<sup>4</sup> covering both developed and developing countries have been observed in Box-1. Bangladesh is expected to experience some of the positive practices observed in these countries, like, enforcement of waste management legislation, development of proper policy and planning framework incorporating both public and private sector, appointment of dedicated waste manager in business organizations to maximize waste management participation for the reduction of waste as well as minimizing the relevant cost.

#### **Box 1: Cross-Country Experiences and Lessons to be Learned**

- *Malaysia*

Recycling of household waste depends on the level of awareness and understanding of recycling. Improved education and increasing the accessibility of recycling facilities were found to be the best means of promoting positive attitudes to recycling attitude, partly because they helped to remove barriers preventing households from recycling. One of the effective strategies initiated by the government of Malaysia was recycling bins in every residential area.

<sup>4</sup>HANDBOOK: Waste Management in Developing Countries

● ***Nigeria***

The majority of the residents of the largest city Lagos in Nigeria, are poor and make a heavy demand on resources which at the same time, generate a large quantities of solid waste. Approximately 4 million tonnes of municipal solid waste is generated annually in the city, including approximately 0.5 million of untreated industrial waste. Efforts by the various waste management agencies set up by the state government to keep its streets and neighborhoods clean have achieved only minimal success. This is because more than half of these wastes are left uncollected from the streets and the various locations due to the inadequacy and inefficiency of the waste management system.

● ***China***

Low cost informal recycling is practicing to manage Electrical and Electronic equipment or E-waste in many developing countries like China. Current gaps in environmental management, high demand for second-hand electronic appliances and norm of selling E-waste to individual collectors encourage the growth of a strong informal recycling sector in China. But, this informal-waste recycling is not only associated with serious environmental and health impacts, but also the supply deficiency of formal recyclers and the safety problems of remanufactured electronic products.

● ***Australia***

Small to medium-sized enterprises in Australia face numerous barriers to recycling participation. Inadequate storage space, paucity of readily available information on recycling services and the lack of staff allocated to sort and recycle were identified as major barriers. Cardboard, paper and plastic waste were produced in large volumes with only a small percentage being recycled and these were identified as target areas for local government.

● ***Germany***

Berlin has operated like many large cities/river basins with a partly closed water cycle for hundreds of years through a combination of careful wastewater treatment and the benefits of the soil aquifer treatment through bank filtration to produce potable water from the aquifers.

**5. Waste Management Techniques and their Applicability in Banking Sector:**

It is now, high time to give attention to waste management involving all stakeholders like Government, central bank, NGOs, employees, customers, suppliers, media and

communities. Involvement of financial sector, specifically banking sector is keeping its mentionable footsteps in all economic and developmental activities addressing the environmental issue. In Box-2, techniques of different banks regarding waste management are illustrated in detailed manner.

### **Box-2: Waste Management (WM) Techniques by Banking Sector**

#### **● *World Bank Contribution in WM:***

Drawing on World Bank Group Trust Fund financing and expertise since 2001, the Palestinians were able to improve solid waste management and environmental conditions in 80 communities in Jenin Governorate, with a population of 200,000 people. They achieved this by establishing a new sanitary landfill, closing and rehabilitating 85 dumpsites, and improving waste collection services. Towards the end of the project, the new landfill was expanded to serve all five governorates that comprise the northern West Bank (population 600,000), providing for further cost saving and enhancing public-private partnerships<sup>5</sup>.

#### **● *WM and Recycling in Union Bank :***

Union Bank has been a leader in financing the waste and recycling industry and in 2007 created a niche lending group to work with the industry. Only a few banks are involved in the financing of clean, reusable material from recycled waste, such as plastic, glass, metals, electronics, used oil, green waste (garden organics), and organic waste such as agricultural manure and sewer sludge. The portfolio contains dozens of companies that collect, process, and recycle waste materials, helping to reduce the amount of waste sent to landfills and the contamination of landfills with oil, electronics, and other pollutants. At the end of 2009, the bank's waste and recycling niche lending group had 43 core industry relationships in California, Oregon, Washington, Hawaii, and Texas totaling \$791 million in credit commitments. The majority of its loan commitments finance the required infrastructure to process the incoming streams of waste products to be recycled.<sup>6</sup>

#### **● *WM by Standard Bank Group***

The environmental management system enables Standard Bank Group to track and manage environment-related aspects of their operations such as energy, water,

<sup>5</sup> <http://web.worldbank.org>

<sup>6</sup> <https://sustainability.standardbank.com/our-approach/>

carbon emissions and waste management. One of the environmental efficiency targets set for Standard Bank South Africa using 2009 as a base year was increased paper recycle at 5% by 2011. Moreover, in 2007, it's contractor levies a charge for this removal service and a certificate is issued confirming that the contents have been disposed responsibly. In addition, it's waste management system recovers and sells recyclable or reusable waste, including used paper and, spent printer and photocopier toner cartridges.<sup>7</sup>

Habib et al. (2015) addressed 'Minimizing Environmental Degradation, Wastes and Pollutions' as one of the three basic principles of green growth strategies. Here, waste management is also considered under the functional areas of intervention for green growth of resource efficiency. So, as a key part of financial sector of Bangladesh, banks are logically expected to make praiseworthy contribution in managing wastes properly and commercially through their in-house and financing activities and be an active part of green and sustainable economic growth.

## **6. Rules and Policy Initiatives regarding Waste Management along with their Compliance Issues: Bangladesh Perspective**

Identifying, treating and managing waste in proper manner is must for Bangladesh to attain overall environment friendly initiatives taken by different stakeholders like Government, Bangladesh Bank, Banks & NBFIS, NGOs, etc. To achieve the environmentally efficient waste management, it is prerequisite to reduce waste generation through prevention, recycling & reuse, encouraging companies to adopt sustainable practices and promoting sustainable public procurement practices. But all these would require massive efforts by the regulatory arms of the government as well as the relevant private and non-government entities and this is largely applicable for developing country like Bangladesh.

### ***Rules and Policy Initiatives of Bangladesh Government Addressing Waste Management:***

Environment Conservation Act (ECA), 1995 was adopted to conserve and improve the environmental standards and The Environmental Conservation Rules (ECR), 1997 was circulated to broadly define management of toxic and hazardous substances and guidelines for disposal of waste from different categories of industries. The national 3R goal for waste management is achieve higher levels of waste reduction, reuse, and recycling and minimize

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<sup>7</sup> [https://www.unionbank.com/global/about/environment/sustainable-banking\\_finance/agriculture.jsp](https://www.unionbank.com/global/about/environment/sustainable-banking_finance/agriculture.jsp)

waste disposal on open dumps, rivers, flood plains and landfills by 2015. Here, municipal solid waste, industrial waste, biomedical waste, institutional and commercial waste and agricultural waste are identified by the government as priority sectors. But in reality, while complying the regulatory initiatives it becomes tough to manage waste as suggested in concern policy documents due to some institutional weakness, bureaucracy, lack of public awareness and knowledge gap. Removal of hazardous medical waste from renowned public hospital locality like- Dhaka medical, shifting tannery from Hajaribag to Savar, etc. are the burning examples in this regards.

### ***Policy Initiatives of Bangladesh Bank Addressing Waste Management:***

Efficient management of waste requires an elaborate waste management infrastructure such as waste bins, construction cost of primary and secondary waste collection points, sanitary landfills, convoys of trucks for pooling of wastes, waste treatment and recycling facilities, etc. All these require huge level of financial supports and policy initiatives from Bangladesh Bank (BB). There are a number of initiatives taken by the BB aiming to accelerate the green banking or sustainable banking arena where waste management issue got attention but at a very limited scale.

In 2011, the Bangladesh Bank for the first time address the waste management issue in its Environmental Risk Management (ERM) Guidelines for Banks and Financial Institutions in Bangladesh mentioning the glitches of improper disposal of hazardous waste. Again, in February 27, 2011, BB issued detailed policy guidelines for green banking. The policy noted air pollution, water pollution and scarcity, encroachment of rivers, loss of open space, loss of biodiversity, deforestation and improper disposal of industrial medical and house-hold waste as the key areas of environmental degradation (BB, 2011). Later on, the issue was made mandatory for the newly scheduled 9 banks also in 2013.<sup>8</sup> BB also pay heed to solid waste management and hazardous industry waste in the same circular, when it asked the financial institution to consider the environment and climate change related risk while assessing the overall credit risk of the potential borrower. BB developed a refinancing scheme of BDT 200 crore to ensure financing in renewable energy and environment friendly sector and here it allowed financing in three forms of Effluent Treatment Plants (ETP)- Biological ETP, combination of Biological and Chemical ETP and Chemical ETP attempting to convert to the combination of Biological and Chemical ETP (BB, 2013b)<sup>9</sup>. In 2014, refinancing scheme for renewable energy and environment friendly sector issued by

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<sup>8</sup> Green Banking and Corporate Social Responsibility Department (GBCSRD) Circular Letter No- 05, September 11, 2013.

<sup>9</sup> Maximum credit limit under this refinancing scheme for the three types of ETP arrangements are 4 crore, 2crore and 1 crore respectively.

BB widen its arena for financing in waste management feeling its notable importance in environment. It covers 3 eligible products for getting financing facility under solid waste management and 2 are under liquid waste management with specific maximum allowable credit limit under the refinancing scheme (BB, 2014a). The facilities under this scheme were extended for Islamic shariah based banks also in the same year<sup>10</sup>.

Banks are under close monitoring and regulatory pressure in attaining the direct green financing annual target which ultimately helps to accelerate their financing in waste management (BB, 2014b)<sup>11</sup>. Very recently, efficient waste management gets priority in BB's 'Guidelines on Environmental and Social Risk Management (ESRM) for Banks and Financial Institutions' in 2015, though it is not finalized yet. As per BB (2015), maximum allowable credit limit for Central ETP under 'Liquids waste management' sector is 15 crore BDT<sup>12</sup>. Appreciating all the efforts of BB, it is expected to focus more on waste management under its green banking window through different expected and regulatory interventions.

## 7. Waste Management by Banks in Bangladesh: Status and Perception

In line with global development and response to the environmental degradation, banking sector in Bangladesh is supposed to play important roles as one of the key stake holders. Clapp (2002) argues that distancing, geographically as well as mentally between consumers and their waste, is a very important dimension when talking about the waste problem. So, linking the consequences of waste generated from any sort of business or production activities need to be addressed primarily with producer and subsequently with consumer. Banks are trying to put some footsteps in waste management though at a very limited scale. As part of financing under waste management, banks offer financing to bio-gas, bio-fertilizer, recycle or reprocessing projects<sup>13</sup>, etc. However, there are some inspiring initiatives of some banks for both in-house waste management and financing<sup>14</sup>. Though the overall initiatives till to date from BB is undoubtedly praiseworthy, while there is still a room for further attention and effective drive to make the financing sustainable from social, health and overall environmental context.

<sup>10</sup> GBCSRD Circular No- 06, October 12, 2014.

<sup>11</sup> The annual target for attaining direct green finance of total disbursed/invested loan amount for banks scheduled before 2013 is 5% whereas it is 3% for banks scheduled after 2013.

<sup>12</sup> Sustainable Finance Department (SFD) Circular Letter No- 03, November 13, 2015.

<sup>13</sup> IBBL financed BDT 4.50 million to a client of Kapasia Branch, Kapasia, Gazipur for plastics Reprocessing in 2015. About 50 ton plastic bottles are collected from whole Kapasia area for reprocessing. The client has 36 employees and yearly turnover of this project is about Tk. 4.50 to 5.00 crore.

<sup>14</sup> HSBC recycles used papers to make envelope for re-use, DBBL has financed a project that produces quality organic fertilizer from fruits and vegetables wastes.

### ***Cases on Financing in Waste Management by Banks in Bangladesh:***

Banks in Bangladesh are proving exemplary initiatives in waste management. Generally, the environmental and health problems related to waste affect to the highest extent those inhabitants who have the least resources and therefore, very little power to change their situation, as they do not affect policy-making (Forseyth, 2002). Banks can put their bold footsteps in those areas through their financing. Box-3 spotlighted some of those initiatives.

#### **Box-3: Cases on Financing in Waste Management by Banks in Bangladesh**

##### ***a) Challenges in Animal Waste Management through Bio-gas Financing***

Mr. Shafiq, a farmer of Jamalpur installed a bio-gas plant taking loan from the local branch of a private commercial bank under four cow model. Besides the environmental motive of getting rid of negative impact of animal waste he was looking for some economic benefits from producing gas, electricity and organic fertilizer as well. Everything was going right as long as the cows were fed well; sufficient slurry was produced to generate desired volume of biogas. But the problem started when the farmer could not collect and feed sufficient grass and straw because of huge flood in the area. The volume of gas produced was declining day by day but the farmer failed to get supportive response from the supplier. The problem intensified when two cows died of malnutrition and the farmer, being frightened, sold another cow. Subsequently, the plant became inactive and the farmer's investment in the plant was lost. Under this circumstance, the borrower failed to repay the loan.

##### ***b) Successful Conversion of Poultry Waste through Composite Bio-gas Plant:***

Mr. Kabir, resides at Gazipur, has established an ideal composite set up. The firm uses recycled plastic poultry cases; poultry wastes are used for bio gas generation for fuel and electricity; and other wastes are used for compost fertilizer. The firm uses manure of the poultry to produce biogas which is used for electricity generation and cooking for farm laborers. To build this eco-friendly poultry composite, Mr. Kabir was awarded the best Trophy in the year of 1998 from the Directorate of Youth Development. Mutual Trust Bank financed him a composite credit facility of BDT 106.00 lac in different forms. Total cost of the project is BDT 1200 lac in an area of 12 bigha land in Gazipur and the estimated cost of the bio-gas plant is BDT 9.00 lac where Mutual Trust Bank Limited (MTBL) financed BDT 6.00 lac under refinance scheme of Bangladesh Bank in 2011. The plant size is 8000 cubic feet (20 x 20x 20) having a capacity of generating 3000 cft biogas. The gas is currently used for

household cooking and generating electricity for the poultry firm and household purposes. According to the entrepreneur, this type of project is quite viable as it helps to generate gas, electricity and organic fertilizer which can be used both for personal as well as business purposes in a profitable manner.

***c) Organic Waste Management Projects Integrating Dhaka City Corporation and Local Composting Company***

Composting reduces the need for chemical fertilizers, eliminates no methane and has positive spill-over effects on health, as the use of good quality compost in food production improves nutrition (Coad, 2006). Feeling the importance of this technique, Dutch Bangla Bank Limited (DBBL) financed a waste management project namely WWR Bio Fertilizer Bangladesh Limited for BDT 40.00 million (approx.) in 2009. WWR Bio Fertilizer Bangladesh Limited is a private limited company engaged in manufacturing of compost. Their establishment of the composting plants in Dhaka is based upon a concession contract with the Dhaka City Corporation (DCC) in which the local company (WWR BIO) has been granted the right to collect organic waste from local street markets in Dhaka. The plant of the client is located at Bhulta, Rugganj, Narayangonj.

**Source:** Based on the information from Demand and Supply side.

***In-house Practices of Waste Management by Banks in Bangladesh:***

A number of scattered in-house and financing moves focusing waste management have been observed by banks in Bangladesh. Some of the key initiatives are illustrated in Box-4.

**Box-4: Some Scattered In-house Practices of WM by Banks in Bangladesh**

● ***Mutual Trust Bank Limited:***

Use of scrap or one side used papers for note pad has become usual practice in the workplace.

● ***Islami Bank Bangladesh Limited:***

The Bank emphasizes in waste minimization of its resources and centrally collects its e-wastes and other solid wastes from every operational unit and disposes centrally through auction. In 2015, the bank earned BDT 2.40 million from sale of its e-wastes.

● ***Trust Bank Limited:***

Use scrap paper for taking draft print and as note pads.

- Bank Asia Limited
- Both sides of papers are used and wasted papers are collected using bins after shredding
- Food wastes are collected by community cleaners on daily basis
- Toner, cartridges and newspapers disposed off through community cleaners

**Source:** Annual Reports

### ***Analysis of the Survey Findings and Recommendations:***

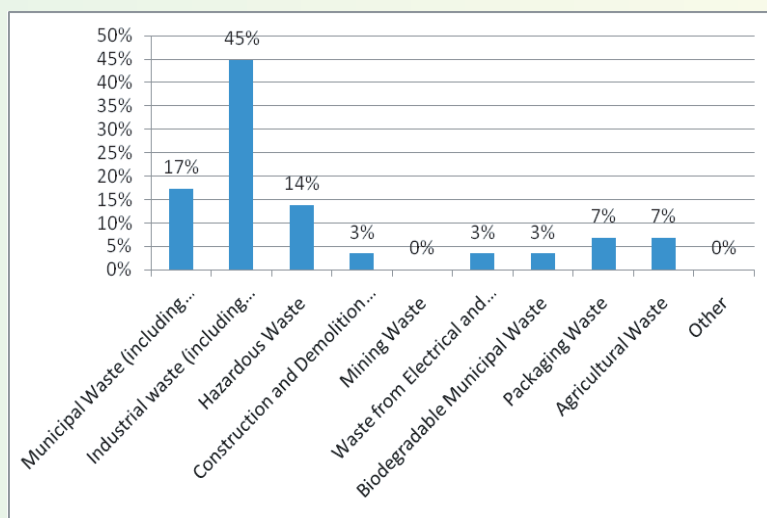
The survey data from the study reveals that from 2013 to 2015 total direct green finance in different products by banks in Bangladesh is getting its increasing trend (Table-1). Biogas, Bio-fertilizer and ETP are directly related to waste management among these products. Except Bio-fertilizer, other two products showing a growing tendency whereup to June, 2016 the trend is expected to follow the same pace at the end of the year. The total number of projects financed by banks upto June, 2016 are 3022, 5 and 396 respectively for Biogas, Bio-fertilizer and ETP. This trend is encouraging from waste management concern particularly in Biogas.

**Table-1 Direct Green Finance (BDT in '000')**

Products	2013	2014	2015	June, 2016
Biogas	20053	13430	135931	173206
Solar Home system	25393	31487	30896	17986
Solar Panel Industry	0	0	500550	99730
Solar -Irrigation	27250	20304	1575	20000
ETP	153498	322599	353591	391491
Modern Bricks	310631	376409	333309	136920
Bio-fertilizer	1700	3034	1054	510
Others	189087	298258	341480	274503
Total Direct Green Finance	727611	1065520	1698386	1114346

**Source:** Survey Data

To know in which type of wastes getting priority to banks for their financing, waste has been classified in ten categories- Municipal Waste (including Household and Commercial), Industrial waste (including manufacturing), Hazardous Waste, Construction and Demolition Waste, Mining Waste, Waste from Electrical and Electronic Equipment (WEEE), Biodegradable Municipal Waste, Packaging Waste, Agricultural Waste and Others.

**Figure 1: Type of Wastes Get Priority by Banks for Financing (in percentage)**

**Source:** Survey Data

The survey shows that, industrial waste (including manufacturing) got the highest priority (45%) where municipal waste (including household and commercial) took second position (17%). It is good to see that industrial waste receive most attention as it is responsible for a significant portion of water pollution specifically around Dhaka city (Figure-1).

**Table-2 Finance by Banks in Waste Management related Products (BDT in '000')**

Products	2013	2014	2015	June, 2016
Biogas	150421	86810	137456	12936
ETP	15603520	34410132	57797531	19794230
Financing waste and hazardous disposal plant	500000	2001770	346200	0
Financing waste paper recycling plant	981380	394640	688664	1256779
Financing waste battery recycling plant	197640	510460	542100	340400
Clean water supply project	4100	0	4120	12830
Plastic waste recycling plant	0	0	41113	427193

**Source:** Survey Data

Table-3 depicts that except in 2015, banks concentrate their exposure more in rural area compared to urban area in terms of the number of clients for financing in waste management. The trend is identical for availing refinancing facility from BB except June, 2016. On the contrary, more financing is observed in urban area. It indicates that banks are concentrating more in urban area while doing financing with their own fund but in case of availing refinancing facility and covering clients, they gave more concentration on rural area. This demands logical synchronization.

**Table-3 Rural / Urban Green Finance and Refinance Facility (BDT in '000')**

	Rural			Urban		
	2014	2015	June, 2016	2014	2015	June, 2016
Amount of Finance in Waste Management	57686	14071	13067	4438120	3994643	7402223
Number of Clients	239	105	52	118	1163	44
Amount of Refinance	84018	13521	15960	51700	4700	17500

**Source:** Survey Data

Refinancing facility availed for Biogas enjoyed a swelling trend over the study period except June, 2016 (Table-4). From 2015 and onward banks started to avail the facility for ETP. But surprisingly only in FY 2015, banks availed the facility for Bio-fertilizer, where it is expected to continue the effort for agrarian country like Bangladesh to reduce the excessive use of chemical fertilizer.

**Table-4 Product-wise Refinance availed from Bangladesh Bank**

Products	2013	2014	2015	June, 2016
Biogas	51444	67644	372069	8325
ETP	0	0	11561	19936
Solar Home System	2247	47743	13578	0
Modern Bricks	42250	22000	19120	5000
Solar Panel Industry	0	0	10000	0
Bio- fertilizer	0	0	375	0
Solar - Irrigation	27250	16650	0	0
Others	0	480	56600	5025
Total	123190	154517	483303	38286

**Source:** Survey Data

Security in case of providing credit facility is a core requirement for banks. But the justification and volume of it may vary from credit product to product based on the nature and objectives of the same. Security requirement may be relaxed for financing in waste management related products under green finance considering them from CSR commitment. Figure-2 states that, in case of Biogas 60% of security considered as single (borrower) security, for Bio-fertilizer both single (40%) and group security (40%) is taken equally and rest 20% is met up with other forms of security. However, in case of ETP both forms of security (single and group) got priority (57%).

**Figure 2: Security Measures for Waste Financing (%)**



**Source:** Survey Data

To ensure the efficient waste management in real sense, banks need to focus on the types of waste producing from the projects financed by them besides paying attention to profit making capacity. Proper mode of disposal for particular type of waste is equally important to safe the quality of our environment as a whole. The study reveals that highest percentage (30%) of waste took in the form of sludge from Effluent Treatment Plant (ETP) or Sewage Treatment Plant (STP) and this picture is mostly observed in Textile industry. So, banks need more caution in this regard from the very beginning of project appraisal. Municipal waste and Hazardous waste got second position (20%). Table-5 also demonstrates the 'Mode of Disposal' besides types of waste generated from different sources. 38% wastes are disposed through recycle (municipal and plastic wastes cover significant portion) whereas reuse and other forms of disposal techniques got the second priority in treating waste in environment friendly manner. Reuse is widely practices for paper waste and E-waste.

**Table-5: 'Types of Waste' and 'Mode of Disposal' (%)**

Types of Waste	%	Mode of Disposal	%
Municipal Waste	20%	Recycle	38%
Hazardous waste	20%	Reuse	25%
Overburden or mine waste	5%	Landfill	6%
Construction waste	5%	Incineration	6%
Sludge from ETP or STP	30%	Others	25%
E - waste	5%		
Other non - hazardous waste	15%		

Source: Survey Data

### ***Perception Survey of Banks on Waste Management and Recommendations:***

Perception of sample banks on waste management has been verified through availability and authenticity of collected information. To link the waste management (WM) with banking sector of Bangladesh, some questions covering critical information like- benefit, challenges, difficulties, etc. were administered among different banks to know the bankers' perception. Respondents have given their perception on a five-level Likert scale as "1" for "Strongly disagree", "2" for "Disagree", "3" for "Neutral", "4" for "Agree" and "5" for "Strongly agree". The reliability test of the qualitative questions by using Cronbach's Alpha is also conducted in the study to know the inter-correlations among test items or questions incorporated in the questionnaire.<sup>15</sup>

Table- 6 presents a summary of banks' perception regarding benefits and difficulties of financing including refinance facilities from borrower's own source, banks or from BB for waste management. There are six statements regarding the issue and value of Cronbach's Alpha is 0.821. Test results illustrate that there is an internal consistency among the six statements which indicate that the set of items are from a single uni-dimensional construct.

The respondents were slightly more than neutral in case of opining on the benefits of availing refinance facility of BB for financing in WM related products. However, it is recommended that all the respondents will strongly agree regarding this refinance facility to make the initiative successful. Bankers are nearly agreed regarding the difficulties faced by them in getting refinance facility from BB and also the advantages of banks for

<sup>15</sup> Cronbach's Alpha increases as the inter-correlations among test items increase. Therefore, it is known as an internal consistency estimate of reliability of test scores.

financing in WM with their own fund. Difficulties of banks in financing WM with their own fund and advantages of clients from financing in WM are widely agreed by bankers as average scores are 4.19 and 4.14 respectively. However, it is a matter of worry that, all the respondents highly (4.38) agreed that clients are facing difficulties for financing in WM related products. The situation needs to be improved very quickly to ensure the successful implementation of environmental friendly initiatives taken by banks and BB.

To overcome these difficulties faced by clients, a number of initiatives can be recommended like- seek for expert opinion as WM related projects are little bit technical, arrange for training to develop more technically skilled man power in this area, ensure market readiness to accept the product/output of the WM projects with the help of Government support, etc. may be the mentionable ones.

**Table-6 : Summary of Benefits and Difficulties of getting Financing for Waste Management related Products**

Particulars	Minimum	Maximum	Mean/Average	Cronbach's Alpha if Item Deleted
The Benefits of Availing Refinance Facility of Bangladesh Bank	1	5	3.29	.830
The Difficulties in Getting Refinance Facility from Bangladesh Bank	2	5	3.62	.750
The Advantages of Banks in Financing Waste Management with Bank's Own Fund	3	5	3.71	.813
Difficulties of Banks in Financing Waste Management with Bank's Own Fund	3	5	4.19	.759
Advantages of Clients from Financing in Waste from Bank's Perception	3	5	4.14	.785
The Difficulties of Clients for Financing in Waste Management from Bank's Perception	3	5	4.38	.813
Cronbach's Alpha	.821			

\* 1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly Agree

Source: Survey Data

## 8. Concluding Remarks:

Bad waste management practices need to be replaced by good ones and it is widely applicable for developing countries like Bangladesh, where policy interventions from Government end alone cannot achieve the target of make the country clean and environment friendly. Contribution of other stakeholders including Bangladesh Bank, NGOs, banking sector, media, etc.can give a robust drive to accelerate the efficient waste management of the country as development partners. Of them, banks in Bangladesh are performing appreciating role in this regard, in spite of some challenges and limitations as the study reveals. Banks need to address the problems with effective and sustainable solutions, like- design specific credit product dedicated to waste management at industry level, introduce deposit scheme with comparatively higher return to depositors who are practicing healthy waste management in their business operations where banks can consider this extra cost of fund as CSR expenditure, positive as well negative incentives by BB for both business unit producing waste and lending institution can be introduced and alike. Banks of Bangladesh are now playing a praise worthy role in ensuring environment friendly country through their financial interventions and practicing conscious in-house waste management. In a nutshell, besides linking waste management with banking sector, a behavioral change in all stakeholders in the direction of attaining efficient waste management is a must to earn a sustainable and clean Bangladesh.

## Acknowledgements

The author is thankful to Bangladesh Bank for developing a detailed Green Banking Policy Framework and Environmental Risk Management Guideline in 2011 which addressed the waste management issue very vividly from financing point of view. The extensive survey and data collection from 21 commercial banks on linking waste management with banking sector in Bangladesh has helped the author to apprehend the current status of and banks' perception regarding waste management.

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