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# An Integrated Solid Waste Management Approach: The Dhaka Cantonment Perspective

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**Abstract**

Solid waste management is considered as one of the most immediate and serious environmental problems confronting municipal authorities in the developing countries like Bangladesh. Inefficient management and disposal of solid waste is an obvious cause of degradation of the environment in most cities like Dhaka. For Bangladesh Army (BD Army), the resource constraint is an undeniable fact; it cannot be elucidated overnight. In the present climate adaptation and mitigation structure of BD Army, there are Cantonment Boards located in all the cantonments for solid waste management. In addition to tactical and technical matters, there are various administrative aspects also awaiting attention in present climate adaptation and mitigation process of the BD Army structure. The perception, approach and operational procedure in this field may have to be redefined. Adopting an integrated approach along with the help of Dhaka City Corporation, solid waste management can improve the quality of life in Dhaka Cantonment where good governance will take the lead role. Attitude towards disposal of waste plays a vital role for a new change. The present study develops a forecast for future waste generation that can assist in managing the waste in an effective way so that the adverse effect of generated waste on environment can be minimized.

**Keywords**: Bangladesh Army, adaptation, mitigation, good governance, disposal, fund

## Introduction

Waste is an unavoidable by-product of human activities. Economic development, urbanization and improving living standards in cities have led to an increase in the quantity and complexity of generated waste. The rapid growth of population and industrialization which degrades the urban environment and places serious stress on natural resources undermines equitable and sustainable development (Zahur, 2007). Inefficient management and disposal of solid waste are obvious causes of the degradation of the environment in most cities of the world. Dhaka, the Capital City of Bangladesh, is expanding rapidly turning it into a mega city with an enormous growth of population at a rate of around 6 percent a year (Zahur, 2007). Dhaka City Corporation (DCC) has an area of 131 km2 and population of 120 million, and population density exceeds 92,000 per km2 (Statistics, 2011). Rapid growth of industries, lack of financial resources, inadequate trained manpower, inappropriate technology and lack of awareness of the community are the major constraints of solid waste management for the fast growing metropolis of Dhaka (Zahur, 2007). Solid waste disposal poses a great problem because it leads to land pollution if

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openly dumped, water pollution if dumped in low lands and air pollution if burnt. Dhaka city is facing serious environmental degradation and public-health risk due to uncollected disposal of waste on streets and other public areas, clogged drainage system by indiscriminately dumped wastes and by contamination of water resources near uncontrolled dumping sites (Hai, 2005).

The population of Dhaka Cantonment is increasing day by day. Many new structures are emerging due to keeping pace with the multifaceted demands. Solid waste production has increased enormously. This is becoming a growing concern for all the institutions (Cantonment Board, 2016). Waste disposal if it does not happen in a hygienic and systematic way may bring artificial disasters for the society. Dhaka cantonment solid waste management includes a bigger area consisting of Cantonment itself and Banani, Mohakhali, Joarshara and Mirpur DOHS. More than 0.3million inhabitants produce nearly 55 tons of solid waste daily in Dhaka Cantonment (Cantonment Board, 2016). In the present climate adaptation and mitigation structure of BD Army, there are Cantonment Boards located in all the cantonments. Dhaka Cantonment Board is the largest among all. Under Station Headquarters; they are working relentlessly to face the challenges of waste management. However, their functional presence is not felt to a very mentionable extent in relation to proper solid waste disposal management. For BD Army, the resource constraint is an undeniable fact; it cannot be solved overnight. With only 150 employees and 14 dump-trucks, managing 42 temporary and fix bins of such a huge area is a challenging task (Anual Report, 2012). Is BD Army making optimum utilization of all available resources to address this serious issue of solid waste management inside Dhaka Cantonment? Only strong determination with vision may help overcome such an manmade calamity. In addition to technical and tactical matters, there are various administrative aspects also awaiting attention in the present climate adaptation and mitigation process of the BD Army structure. For that, the perception, approach and operational procedure in this field may have to be redefined.

On a global scale, we currently are facing three major environmental crises: global warming, depletion of resources, and destruction of our ecosystem (Aliani, 2012). These crises are interrelated and connected to waste and waste management. A rising quality of life and high rates resources consumption patterns have had an unintended and negative impact on the urban environment generation of waste far beyond the handling capacities of the urban government and agencies (Agamuthu, 2010). The Dhaka City Corporation (DCC) is primarily responsible for collecting and managing waste in Dhaka, Bangladesh (Chowdhury, 2014). A significant amount of waste in Dhaka is not collected due to lack of infrastructure, funds and collection vehicles. Despites Dhaka's limited waste management service, community based door-to-door waste collection from households to local waste bins is considered as a success. Informal waste recycling systems are also highly effective in waste recycling and job creation for the poor (MA, 2005).

## Research Objectives

Keeping in mind the foregone problem statement, answers to the following questions are pursued in this research:

a. **Primary Question**. Does the existing system demand an integrated approach to ensuring final disposal of solid waste inside Dhaka Cantonment?

b. **Secondary Questions**. In order to answer the primary question, the following secondary questions need to be answered:

(1) Does the existing structure of BD Army fulfil the development need with a renewed approach and some minor restructuring only?

(2) How does an integrated possible model of a final solid waste disposal method approach to attaining the desired standard?

(3) How will BD Army start an integrated approach inside Dhaka Cantonment with its own financial plan without sub-allocation of funds from the government?

## Background of the Study

BD Army has come a long way since its inception. For any Army's development, contribution to climate change is irrefutable. On BD Army's path, there are significant developments in various fields, but climate change issues remain as a less focused sector both nationally and organizationally. As climate change adaptation and mitigation are generally costly affairs, one possible reason for that may be the resource constraints. However, even with a scarce resource, BD Army can play an important role in the climate change strategy and action plan 2009. In that case, effective utilization of all existing resources is essential. The success of the voter ID project and many other praiseworthy infrastructure construction efforts suggest: there is no lack of technical expertise in BD Army. There are a number of officers who have earned professional reputation both at home and abroad. Students at various institutions produce brainstormed papers and projects also. Being the army of a developing nation, BD Army may not afford huge organizational involvement like City Corporation. What is more practicable now is to revitalize, coordinate, integrate, and direct the existing structure under a bigger umbrella.

This should focus on a system that is low costly, sustainable, yet contributing effectively to nation's development. Sustainability is often defined as the "ability to meet the needs of the present without compromising the ability of future generations to meet their needs (Cohen, 2004). In the environmental literature, the concept of green management for sustainable development has various definitions, all of which generally seek to explain the need for balance between industrial growth for wealth creation and safeguarding the natural environment so that the future generations may thrive (Daily & Huang, 2001). Nevertheless, the issue of how an individual organization or entire society achieves sustainability from the green human resource management movement is still debatable and

unclear. Thus, research on how organizations may structure their facilities to enhance sustainability through good governance initiatives seems paramount.

Governance refers to all of processes of governing, whether undertaken by a government, market or network, whether over a family, tribe, formal or informal organization or territory and whether through the laws, norms, power or language (Bevir, 2013). Governance relates to the processes of interaction and decision-making among the actors involved in a collective problem that leads to the creation, reinforcement, or reproduction of social norms and institutions (Hufty, 2011). Governance here will be treated as exercise of economic, political and administrative authority to manage an organizational affairs at all levels. It is the complex mechanisms, processes, and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and reconcile their differences. The concept of "good governance" often emerges as a model to compare ineffective economies or political bodies with viable economies and political bodies.

Now, for the solid waste management integrated approach, few steps should be followed. First step is the collection, and then comes the integrated approach through good governance, and the final step is its disposal. There are five methods of disposal: Open dumping (a lone method in Bangladesh), sanitary land fill, composting, incineration, and plasma technology. We can also adopt 3Rs (recycle, reuse, and reduce) formula to convert waste to energy as an integrated approach.

## Rationale of the Study

The Government of Bangladesh's Vision is to eradicate poverty and achieve economic and social welfare for all the people. This will be achieved through a pro-poor climate change management strategy which prioritizes adaption and disaster risk reduction, and also addresses low carbon development, mitigation, technology transfer and the mobilization and international provision of adequate finance (Islam, 2013). Keeping the vision in mind, Bangladesh Government has approved "Bangladesh climate change strategy and action plan 2009". The climate change action plan is built on six pillars. Firstly, food security, social protection and health; secondly, comprehensive disaster management; thirdly, infrastructure; fourthly, research and knowledge management; fifthly, mitigation and low carbon development; and finally, capacity building and institutional strengthening (Islam, 2013).

There are 44 programmes for the implementation of climate adaption and mitigation strategy. The programmes funded under the plan will be implemented by concerned ministries or their agencies,with the involvement, as appropriate, of civil society and privatesector. The government is committed to transform the economy, society and polity of Bangladesh befitting a modern nation of the 21st century. The government of Bangladesh is fully committed to take all measures so that climate change is managed in a way that the people are fully protected from its adverse impact; and that the growth path remains stable and moves to a higher plane. The tasks, however, are many and complex. Climate change permeates all sectors and human endeavours. Climate change management

therefore will be a complex and highly interactive responsibility for all public and private sectors (Islam, 2013).

For BD Army, proposing a new organization for solid waste management at Armed Forces Division level can only be a long-term plan, which demands a substantial amount of time and resource. Contrary to these, already there are workable structures available in BD Army. However, it is felt that the efforts are sporadic, and not interlinked or properly coordinated. Therefore, research on the existing system will be primary in nature; hence, it is chosen for carrying out research.

**Key Terms and Definitions**

a. **Waste.** Any gas, liquid or solid residual material at a facility, whether hazardous or nonhazardous, that is not used further in the production of commercial products or provisions of a service and which itself is not a commercial product.

b. **Solid waste.** Solid waste is non-liquid waste material arising from domestic, trade, commercial, industrial, and mining activities. It also includes waste arising from the conduct of public services, such as street sweepings, landscape maintenance, and the clearing of typhoon wrought debris. The term non-liquid is relative, because it includes sludge, such as those from industrial sources and from sewage treatment plants.

c. **Bio-degradable waste.** It refers to all those things that can be easily decomposed by natural agents. Food, vegetables, leaves and branches, paper, cottons, cloths and waste of similar nature constitute bio-degradable waste. Microorganisms help its quick decomposition on natural process. Living things produce organic parts of waste. It contains carbon compounds. Organic waste constitutes a major part of total municipal waste.

d. **Non-bio-degradable waste.** It is not composed of living substances. The waste which is not the result of natural growth is non-bio-degradable waste. Rocks and minerals, plastics and aluminium cans, toxic chemicals and paints are the examples of non-bio- degradable waste.

e. **Types of waste.** There are six different types of waste. Namely: domestic waste, commercial waste, institutional waste, industrial waste, street sweepings, construction and demolition waste.

f. **Polythene hazards**. It is a particular type of hazardous waste for its character and chemical component. It does not get decomposed in any natural process even in many years. It is not therefore biodegradable and friendly to environment.

g. **Solid waste management integrated approach**. First step is the collection, and the final step is its disposal. There are five methods of disposal: open dumping (a lone method in Bangladesh), sanitary land fill, composting, incineration, and plasma technology. Finally, we can also adopt 3Rs (recycle, reuse, and reduce) formula and convert waste to energy as an integrated approach.

h. **Governance.** Governance refers to all of processes of governing, whether undertaken by a government, market or network, whether

over a family, tribe, formal or informal organization or territory and whether through the laws, norms, power or language. Governance relates to the processes of interaction and decision-making among the actors involved in a collective problem that lead to the creation, reinforcement, or reproduction of social norms and institutions. It here will be treated as exercise of economic, political and administrative authority to manage organizational affairs at all levels. It is the complex mechanisms, processes, and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and reconcile their differences.The concept of "good governance" often emerges as a model to compare ineffective economies or political bodies with viable economies and political bodies.

## Methodology

To operationalize this research, both primary and secondary methods of data collection were used. An explanatory type of research is planned as research design. Qualitative research is implemented to produce explanations of the particular case in Dhaka Cantonment. A summary of the data collection method is as below:

a. *Document Study:* This was a secondary data collection method. In this method, various books, publication and articles were consulted. This method helped in research findings, and in formulation of the proposal. A qualitative analysis was carried out in this method. The list is in the Bibliography.

b. *Surveys:* This was a primary source of data for quantitative analysis. One survey was carried out in this research. In this method, analysis was carried out with an open-ended self-administered questionnaire**.**

c. *Interviews*: As a method of qualitative analysis, opinions of a few scholars and experienced officers of the related field were sought. The officers were personally interviewed with both standard open-ended structured and unstructured questionnaires.

d. *Focused Group Discussions (FGDs):* This was a primary source of data for qualitative analysis. Two FGDs were carried out in this research. The researcher moderated the discussion on unstructured open-ended questions.

## Findings

Generation of nuisance waste depends largely on the attitude and consciousness of the people as a whole. Education wholly has nothing to do with it. An attitude towards decency and good taste helps improve the state of place of living.

**Internal Aspects:**

**Attitude towards Collection and Disposal of Waste**: Presently, the waste collection system is controlled and monitored by the cantonment authority

inside the cantonment. Disposal of final waste is done by both the government and organization. In a few remote cantonments, final solid waste disposal is done by open dumping method by the organization itself. But regarding those cantonments which are nearby City Corporation and Municipality, solid waste disposal responsibility lies with the government. Survey questions and interviews are plotted in the diagrams which show the happy mindset of the people of collecting solid waste by the organization but confused about final disposal responsibilities.

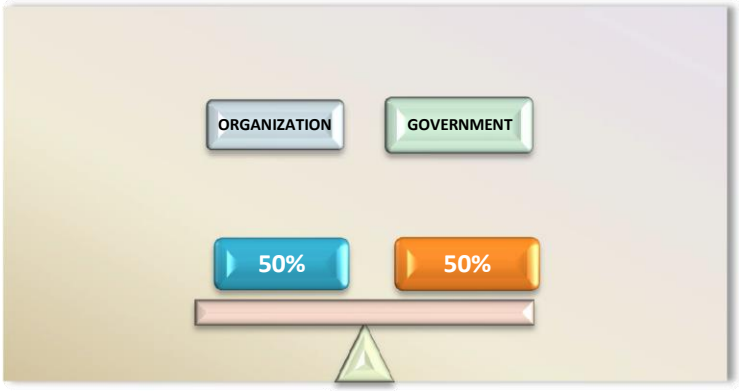



**Figure 1:** Organization vis-à-vis the government

**Attitude towards Littering of Waste:** A survey was carried out inside DHAKA Cantonment by the author to judge the common behaviour of the people in regards to littering of household biodegradable and non-biodegradable solid waste. Five parameters were selected: maintains freedom of will in case of littering the waste, common judgment of people in case of littering that it is an offence, uses of road side bins, perception of a new bin system (biodegradable and non-biodegradable bins keeping together) can change the nature of common people and strict compliance of rules in some selected areas. The survey shows 70% maintains freedom of will in case of littering the waste. About 10% do not believe it is an offence. 30% use bins and 65% believe a new system can change the nature of common people and 85% opine for strict compliance of rules.

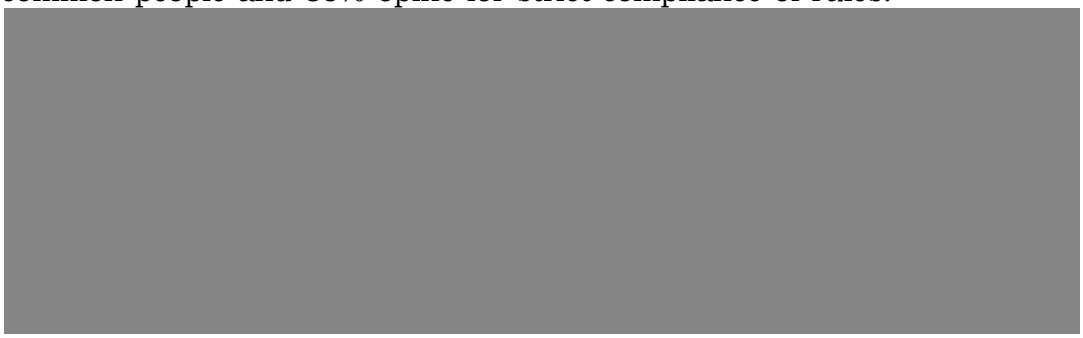


**Figure 2:** Attitude towards littering of waste

**Not Resistance to Change:** Any change is not like the other routine jobs. Here, imagination, knowledge and urge to create something new are essential ingredients. One has to see things beyond its existence. Therefore,

creative and self-driven persons are more required in this sector. However, it appears that BD Army is not basically resistant to change (FGDs). Therefore, the likely risk of success involved in this process concerns more than the likely failure. The BD Army as an organization has limited capacity of and confidence in solid waste management system. At the same time the organization has relative absence of prior experience in implementing such a system. Insufficient sensitization among stakeholders and absence of enabling environment largely depend on capacity and confidence. In case of the image building perspective, any new ideas should be welcome and resistance of change will be less. The right man in this particular climate change field is absent in the organization. BD Army do not recruit environmentalists as well as it does not have enough research capabilities and scope also. Wastage of resources in case of such a new filed will not be accepted by the organization.

**Figure 3:** Problem of Perception and Approach

Mid-level officers participated in the discussions sportingly, and 61% opined that BD Army behaviour would be resistant in case of a new solid waste management system. 71% thought, energetic, creative and competent manpower was absent from this field. 84% thought that not enough time was allotted for research in final solid waste disposal system. 87% opined that wastage of money or less a profit-oriented system would not be accepted though it might be mandatory.

**Adequate Organizational Structure:** Apart from the finance, BD Army possesses adequate infrastructure to carry out final solid waste disposal inside cantonment. In the survey, 72% respondent said that the organisational structure was adequate.

**Figure 4:** State of Present Organizational Structure

**Absence of Skilled Manpower:** The manpower posted to the station headquarter is not skilled enough to carry out final waste disposal functions (FGD). It is not that BD Army lacks in required expertise in totality.

**Figure 5:** Posting of skilled manpower

**Concept of Final Disposal:** A survey about waste reduction at source was conducted taking the pros and cons. Maximum opined for a composting method inside the cantonment.

**Figure 6:** Concept of composting

**Extraction of Methane Gas:** About 85% people think it will be possible to establish a bio-gas plant inside the cantonment and it will be supportive for the cantonment environment.

**Figure 7:** Concept of extracting methane gas

**Waste to Energy Plants:** A huge amount of waste is piling up in the dumping sites. Years together, they are the main causes of air pollution and spreading vector-borne diseases. The waste needs to be converted to energy. It might not be as economical as conventional energy plants. 65% think that if it is not profitable even, we should not go for establishing waste to energy plants.

**Figure 8:** Waste to Energy Plants

**External Aspects:**

**Lack of Vision, Coordination and Direction:** The requirement of solid waste disposal in an environment friendly way, introduction of a waste to energy system and an integrated approach for final disposal including composting and recycle were not centrally envisioned and coordinated. The existing waste disposal system is also not a long-term process oriented and feedback oriented. The survey shows the result of lack of Vision, coordination, and direction.

**Figure 9:** Lack of Vision, Coordination, and Direction

**Lack of Importance and Sponsorship:** A five years defense budget is given on the chart which shows an average of 3.5% national budget is allotted to BD Army:

**Figure 10:** Five-Year Distribution of National Budget for Defense and Army

**Figure 11:** Budget Allocation for Different Services from (2011-12)

However, out of the allocated Army Budget, there was never any special sub-allocation of fund from the government under climate change head for BD Army. In the budget year 2011-12, for the first time ever, some amount of fund is apportioned specifically for R&D. Although the amount is meagre, it carries the sign of a beginning. Common limitations of various research and development cells are given below in a chart:

**Figure 12:** Common Limitations of Various R&D Cells

**Lack of Government Financial Support:** Without sub-allocation of funds from the government, BD Army with their own resources or taking help from Trust Bank can implement integrated approach. But if the government patronizes, it will be an added advantage for the implementation. 65% opine that it should be done with government allocation of budget, 35% think it should be done with own resources:

**Figure 13:** Own Financial Support

**Lack of Pride, Incentives and Recognition for this Job:** About 64% think no incentives will be received by the people who will work for these new projects:

**Figure 14:** Receipt of Incentives by Personnel

**Recycled goods plant:** A survey was carried out in case of the buy-back centre, can dumping machine and packaging plant establishment inside the cantonment. The result shows that more people are optimistic about the success:

**Figure 15:** Concept of Extracting Methane Gas

**Image building:** BD Army can help the government through Dhaka City Corporation in building a clean and green Dhaka City and increase the image of the organization. As a pilot project the Dhaka Cantonment can

start the waste to energy project. Basing on the success or failure the government can take decisions on establishing more projects in all the city corporations and municipalities. 75% opine that integrated solid waste disposal management is possible inside the cantonment and it will uphold the image of the institution and uphold the slogan Go Green:

**Figure 16:** Image Building

**Integration with Dhaka City Corporation:** In case of final waste disposal and implementing 3Rs concept, it might happen that Dhaka Cantonment needs more assistance in daily basis from Dhaka City Corporation. In such circumstances, an integrated proposed approach model might help to a greater extent. About 64% opine coordination is possible and both the stakeholders' benefit will be ensured:

**Figure 17:** Coordination with Dhaka City Corporation

**Impact analysis of implementation of an integrated approach:**

a) Strengths and opportunities which may help to transform current activity into an integrated approach to solid waste management in Dhaka Cantonment:

**Table 1:** Impact Analysis – Opportunities

| SL. | Opportunities | How far these opportunities may help to transform current activities in to an integrated approach of solid waste management through good governance in Dhaka Cantonment? | | | |
|---|---|---|---|---|---|
| | | High | Medium | Low | Yet to determine |

| | | |
|---|---|---|
| 1 | A high degree of administrative commitment from the top brass |  |
| 2 | The universal value, appeal, and recognition of the subject | |
| 3 | Flexibility and adaptability to changing contexts |  |
| 4 | Attitude towards collection and disposal of waste |  |
| 5 | Attitude towards littering of waste |  |
| 6 | Not resistance to Change |  |
| 7 | Adequate Organizational Structure |  |
| 8 | Absence of Skilled Manpower | |
| 9 | Concept of Composting, bio gas and recycle plants |  |
| 10 | Waste to Energy Plants | |

**Source:** Compiled from interview and survey by the author in 2016

b) Challenges and threats which may pose restrictions to transform current activity into an integrated approach to solid waste management in Dhaka Cantonment:

**Table 2:** Impact Analysis – Challenges

| **SL.** | Challenges | Severity of impact on integrated approach, if appropriate measures are not taken? | | | |
|---|---|---|---|---|---|
| | | **High** | **Medium** | **Low** | **Yet to determine** |
| 1 | Lack of Vision, Coordination and Direction |  | | | |
| 2 | Limited capacity and confidence | | |  | |
| 3 | Lack of Importance and Sponsorship | | | |  |
| 4 | Lack of Government Financial Support | |  | | |
| 5 | Lack of Pride, Incentives and Recognition for this Job | | |  | |
| 6 | Recycled goods plant | |  | | |
| 7 | Image building | | |  | |
| 8 | Coordination with Dhaka City Corporation |  | | | |

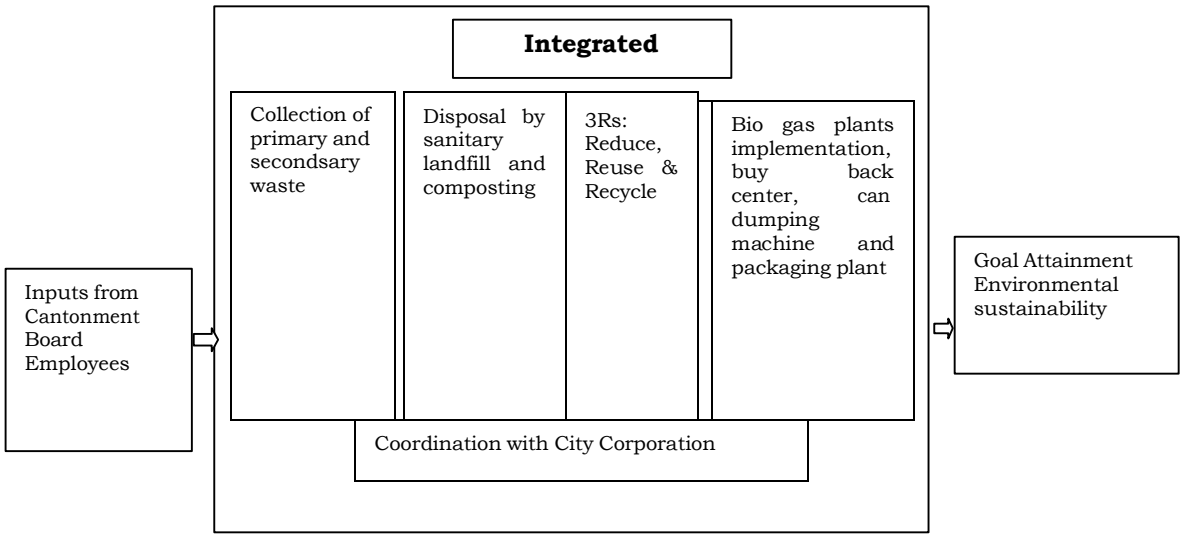
**Source:** Compiled from interview and survey by the author in 2016

From the analysis of possible impact of challenges and opportunities, it can be understood that with a few difficulties Dhaka Cantonment can start an integrated solid waste disposal if appropriate measures are taken. This is because effects of challenges are likely to be less dominant than overall advantages offered by opportunities.

**Recommendations**

a. A high degree of administrative commitment from the top brass should be ensured.
b. An approach towards disposal of waste needs to be changed. As an organization, BD Army should possess an optimistic outlook on solid waste processing and recycling as close to the source of generation as possible.
c. Littering of waste should be considered as an offence inside the cantonment and adherence to strict compliance of rules.
d. Creative and self-driven persons should be posted in this sector.
e. Despite the allocation of army budget, special sub-allocation of fund under climate change head should be given from the government for initial establishment. In case of non-availability of fund, steps should be taken to start the process from own resources.
f. In addition to organizational reform, adequate infrastructure building activities should continue to carry out an integrated waste disposal approach.
g. Training should be ensured to produce skill manpower.
h. Incentives should be received by the people who will work for these new projects.
i. The management system should be centrally controlled, long term and feedback oriented.
j. The concept of composting along with sanitary landfill should be taken into considerations. Bio-gas plants should be implemented. Buy-back centers, dumping machine and packaging plants should start functioning from the very beginning.
k. Waste to energy plants might be thought off though it might be costly and non-profitable.
l. To revitalize, coordinate, integrate, and direct the existing structure under a bigger umbrella, Dhaka Cantonment should ensure necessary support from both the city corporations of Dhaka.

**Proposed Model**




**Concluding Remarks**

For BD Army, the resource constraint is an undeniable fact; it cannot be solved overnight. In the present climate adaptation and mitigation structure of BD Army, there are cantonment boards located in all the cantonments. In addition to technical and tactical matters, there are various administrative aspects also awaiting attention in the present climate adaptation and mitigation process of the BD Army structure. Climate change is no longer something to happen in future; it is here and now. Bangladesh is among the countries that are thought to be worst affected by climate change. It is a major long-term constraint permeating all sectors of the economy adversely affecting the well-being of the people of the country. For that, the perception, approach and operational procedure in this field may have to be redefined. Attitude towards disposal of waste plays a vital role for a new change. BD Army should possess positive mentality in applying an integrated approach to solid waste management. The law should be enforced and strict compliance of rules should be adhered to. Creative and self-driven persons can only bring success to this sector. Fund under climate change should be created for the initial establishment. The abandoned infrastructure might help for the initial establishment. Training should focus on creating skilled manpower. The people who will work for these new projects should be rewarded. The management system should be centrally controlled. The plan should be for long term and feedback oriented. The concept of composting along with sanitary landfill should be taken into concern. Bio-gas plants implementation, buy-back centers, can dumping machines and packaging plants should start functioning from the very beginning.

BD Army has come a long way since its inception. For any Army's development, contribution to climate change is irrefutable. On BD Army's path, there are significant developments in various fields, but climate change adaptation and mitigation remain as a less focused sector both nationally and organizationally. As climate change adaptation and mitigation as generally costly affairs, one possible reason for that may be the

resource constraints. However, even with a scarce resource, BD Army can play an important role in the climate change strategy and action plan 2009. In that case, effective utilization of all existing resources is essential. The success of the voter ID project and many other praiseworthy infrastructure construction efforts suggest: there is no lack of technical expertise of BD Army. There are a number of officers who have earned professional reputation both at home and abroad. The students at various institutions produce brainstormed papers and projects also. Being the army of a developing nation, BD Army may not afford huge organizational involvement like City Corporation. What is more practicable now is to revitalize, coordinate, integrate, and direct the existing structure under a bigger umbrella. This should focus on a system that is low costly, sustainable, yet contributing effectively to nation's development.

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