Sustainable Management Scheme for Market Solid Waste: A Case Study in Khulna Metropolitan City

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Abstract—Market Solid Waste is massively produced now-a-days that it requires proper and effective management to erase environmental pollution. That’s produced in a huge quantity with the increase of population and the wastes are mainly responsible for the local area pollution. This study includes the proper analysis of the volume of the market waste that produced in the Khulna region which finally motivated to take a sustainable decision of the management of the Market Solid Waste. In addition, waste causes overall environmental pollution is enhanced mainly by clogging of drainage system. This management scheme will help to reduce the waste and save overall environmental pollution and at the same time would be a source of biomass energy. For this purpose at first Market Solid Waste will be collected. Wastes are differentiated after collection then transported to the site and finally being processed. This scheme will give a better alternative of existing solution of the management of Market Solid Waste in Khulna city. Therefore this paper provides a technique for the management of market food waste, their utilization & environmental protection.

Index Terms—market solid waste, effective management, sustainable decision, existing solution, environmental protection

I. INTRODUCTION

Market wastes are those wastes which are generated usually in the market such as primarily organic wastes, leaves, and unsold foods, vegetables etc. discarded at or near markets. Day by day population increases so rapidly in our country. Khulna is not different from this passion. Khulna (22° 49’ 0” N, 89° 33’ 0” E) is the third largest metropolitan city in our country and huge population (1.39million BBS (2009)) gather here every day to satisfy their demand (Joardar et al., 2013). A lot of market exists here and produces a huge amount of waste (2 to 3 tons/day vary in every market). For collecting data market survey was performed. Data was collected in summer season and the source the data was local market committee as well as questioner survey also performed with the help of Tokay, service providers and shopkeepers. Khulna City Corporation (KCC) is responsible (according to the KCC ordinance, 1984) for maintaining MSW in Khulna (Rahman et al., 2013). Resource limitations are the main cause, for which total wastes can’t be collected, transported and treated properly (Rahman et al., 2013). From investigation and observation it was found that two third of produced wastes are managed and processed by KCC. Other wastes find their way in nearby roads, rivers or ponds, drains. MSW are collected by KCC workers and transported in two dumping sites Rajbandh and Joykaly (Joardar et al., 2013). Bad odor releases from the whole part of the area. Again from such dumping sites ground water contamination by the leachate, surface water contamination by the process of runoff (Azad et al., 2013). For the presence of various types of gases air contamination must be occurred and finally not only this but also rodents, pests, slope failure, erosion can be occurred (Bhuiyan et al., 2013). A very little part is used as fertilizer by the processing of local community and some part is used as fish feed. For the proper management of these wastes must be needed a proper framework, maintenance and overall public awareness is also necessary. Though it becomes expensive and complex because of continuous increasing of urbanization, this difficulties can be solved by providing necessary level of public services and managing a proper infrastructure. Finally in this paper the attempt of the study is to provide a proper and planned management scheme for the management of MSW. In this paper the present study covers the following objectives:

• Proposal of a planned infrastructure to reduce the wastes as well as pollution.
• The alternative root of wastes management scheme.

II. PROPOSED MANAGEMENT SCHEME

Study has been performed by physical survey in the main local market in Khulna city. Survey also covered four main local market namely Nirala katcha bazaar, Rupsha bazaar, Mistypana bazaar, Gallamary bazaar. After completing data acquisition total wastes are divided
in three categories for maintenance purpose and the finding data is represented below as a graph chart.

![Generation of solid waste in Khulna Metropolitan City](image)

Figure 1. Generation of solid waste in Khulna Metropolitan City

![Different types generated wastes in local market](image)

Figure 2. Different types generated wastes in local market

For the management of market wastes the financial support is a must. Without it no significant steps will be taken to manage this huge environmental hostage. Proper collection, processing and management can give a good result which is the key in this study. The management scheme will be able to give the best results when proper collection and handling can be ensured. Awareness is also important to ensure the results of the scheme. Biomass is the growing concern now-a-days and these wastes can be worked as a fuel of this. Proper steps for management will be able to solve the scarcity of production of energy. On the contrary recycling and processing gives us the best opportunity for reuse and the same time it ensures the proper utilization of resources. In addition of our study BOD ponding is another management proposal which also the better solution of management for maintained particular types of wastes than existing practice. This study proposed this solution which can ensure the better reduction of present management and gives the sustainable solution to control the overall environmental pollution in a planned way.

![Proposed management scheme of MSW](image)

Figure 3. Proposed management scheme of MSW

### III. Conclusion

This management scheme is essential because of it is proposed the alternative which is helpful to reduce overall environment pollution. Proper management of this MSW would be a source of biomass energy which will reduce the shortage of energy. Again for recycling and reuse the necessity of raw materials cannot be ignored. This study also includes the sources of raw materials from MSW which reduce the scarcity of raw materials. In addition this study also includes the concept of BOD ponding which will help to reduce water pollution. The rapid increments of huge amount of wastes are not only dangerous for environment but also for public health. And this two are coincidence event. So proper management plan needed as early as possible which is designed to do in this study.

### REFERENCES


Md. Sayed Rahman, Md. Rokon Hasan, Ebna Forhad Mondol, Tania Tasnim Sinthia, Nusrat Jahan Zerin is pursuing their undergraduate degree in Civil Engineering from KUET, Bangladesh.