A Survey on Solid Waste Management in Garments Industry of Bangladesh

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Abstract

Management of solid wastes produced in the garments industry by reducing, recycling, and disposal is a significant matter of concern. Garment industries will continue to produce a large number of solid wastes each year. With increasing solid garment wastes the cost of management is increasing with the depletion of available disposal facilities. This remaining residue is a burden unless it is disposed of properly. In this study, we aimed to identify the present situation associated with the management of solid wastes generated from garment industries. The efficiency of solid waste management is dependent on proper management, recycling, available resources for disposal and the willingness of concerned authority. With location, seasons, and industry type solid wastes generation varies. Regardless of those facts recycled wastes possess economic value if they can be collected and reused correctly. The existing barriers to collecting, recycling, reuse and disposal of different wastes include costing, proper planning for reusing of recycled materials, suitable technology and awareness.

Keywords: Textile Industry, Solid Garment Waste, Solid Waste management, Recycling and Disposal, Environment.

1. Introduction

Management of waste depends on social and technological advancement. Depending on the amount and type of wastes, available facilities and disposal capacity wastes management may vary.Minimizing waste generation and environmental protection can be achieved by technological advancement. Before discharging to the environment the effluents and other wastes must be treated as par requirements using the suitable technology.

Clothing demand has grown by 30 times since the 1950s as reported [1]. With this growing demand, solid waste production is also growing. Waste generation is growing with increasing consumption of textile products worldwide. The majority amount of textile waste can be recycled if proper measures are taken. According to the source, textile wastes can be classified as post-consumer waste and pre-consumer waste. Unlike underdeveloped countries, the developed countries have effectively created environmental awareness, social responsibilities in waste management practices being more efficient. The burying of recyclable waste has been prohibited in European Parliament [2].

In most cases, management considers landfilling as a means of waste disposal rather than available and effective waste management systems. Turkey has set an example of recycling 84% of total textile waste as a part of effective waste management as reported in 2008, while in Lithuania 71% ended up in landfills [3].This ineffective management was due to the lack of equipment and technology. Being a cheaper way of disposal landfilling also did not trigger the authority to find new disposal solutions [4].The textile and clothing industryis the backbone of Bangladesh's economy for a long time. Due to low labor cost, minimum skill requirements of labor, and relatively available technology garments industry in Bangladesh has grown for over decades [5].

The solid waste significantly impacts on the environment. The responsibility of the industry is to minimize the impacts on the environment caused by their production processes. The majority of solid wastes are produced during the garment manufacturing stage and the higher the production, the greater the amount of waste. From the economic point of view, apparel industries have a significant contribution to the economy of Bangladesh. Solid waste directly impacts on the environment and social life due to improper disposal system. Solid wastes from apparel industry have potential application if it is recycled properly. Solid waste generation can be increased depending on manufacturing operations. The Knit apparel industry itself requires a minimum disposal area of 3.155 km of which only 40% of cleanliness capacity is available in the industry[6].

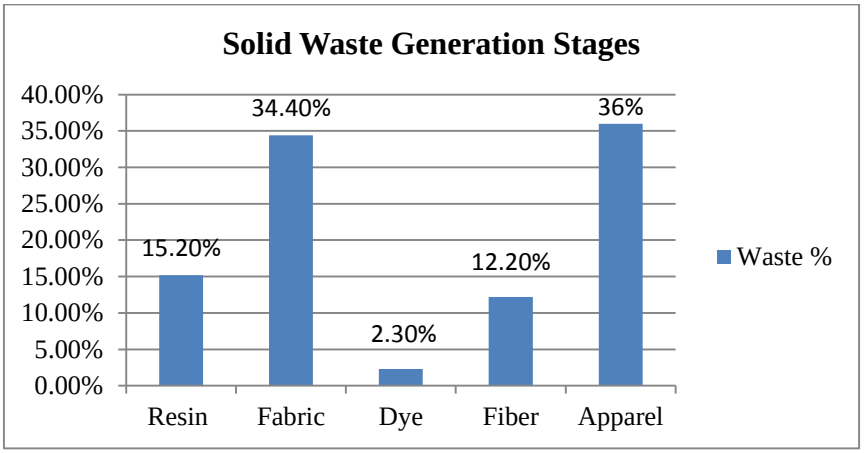

Figure-1: Maximum solid waste generation stages [7]

Land being filled and water bodies were polluted due to just throwing away the solid waste around the factory area. Solid wastes are not collected completely. A significant amount of wastes are disposed of by dumping which causes pollution and environmental hazard [7]. Bangladesh is dependent on importing from overseas to run garment industries. Instead of throwing away if the solid waste processed properly it can provide as a source of raw material and save money and materials.

This survey aimed to find out the present statistics and existing management regarding solid waste disposal and its utilization in the textile industry of Bangladesh.

1. Finding out the current status of the solid waste management system.
2. Finding out the impact of recyclable solid waste as a source of starting materials for final product.
3. Finding out the impact of solid waste management regarding environmental issues and solid waste disposal.

2. Research strategy

This survey is based on selected questionnaires asked to the different garments factories in Bangladesh.

2.1 Research Design

In our current survey, we have directly collected information from various industries regarding solid waste and used it as primary source of information. As a secondary source, supporting information has collected from different journals and research articles regarding solid waste management.

2.2 Target Population and Sample Size

About 50 factories were targeted from various areas in Bangladesh to study and analyze the present condition of solid waste management.

2.3 Data Investigation Procedure

Information collected from different factories was investigated and analyzed using regular computer software and represented as a bar diagram.

$$\boldsymbol{Frequency}\% = \frac{\boldsymbol{frequency}}{\boldsymbol{popuation}} \times \mathbf{100} \quad \textbf{(1)}$$

3. Results and discussions

Five parameters were taken to analyze and represent survey results using a bar diagram.

3.1. Waste Disposal Practices

Most of the manufacturers were unaware of proper waste management practices. Now a day, manufacturers recycle their waste and make yarn from the recycled fiber. Our study shows that around 50% of the garment manufacturers recycle their solid waste and the rest of the wastes are either sold or disposed of by stockpiling, landfilling and incineration.

Table 1. Details about Waste Disposal Practices

What does your company prefer in case of waste processing?		
Response	**Frequency**	**Percentage**
Landfilling	9	18%
Incineration	5	10%
Recycling	7	14%
Stockpiling	2	4%
Selling to Buyers	25	50%
Others	2	4%

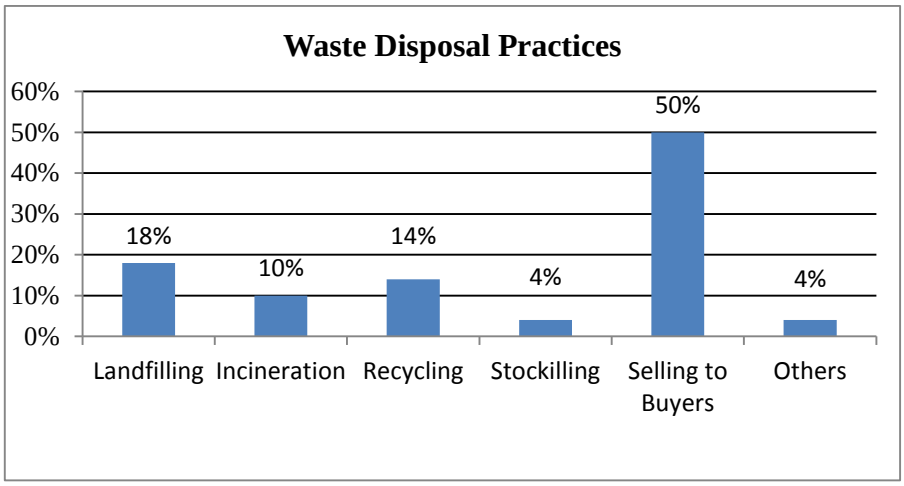

Figure 2. Waste Disposal Practices

3.2 Barriers to Recycling

Despite being potential raw materials solid wastes are not recycled effectively in most factories due to some existing barriers namely shortage of technology and equipment, skilled manpower, lack of awareness about the impact of wastes material on environment. Suitable technology was the main barrier to recycling and accounted for 42% as indicated by the management. Similarly, shortage of tools, consumer awareness, materials, production costs were accounted for 26%, 16%, 10%, and 6% respectively.

Table 2. Details about Barriers to Recycling

What are the barriers to recycling?		
Response	**Answer Given**	**Percentage**
Lack of equipment	13	26%
Lack of Technology	21	42%
Lack of material	5	10%
Lack of consumer awareness	8	16%
Production costs	3	6%

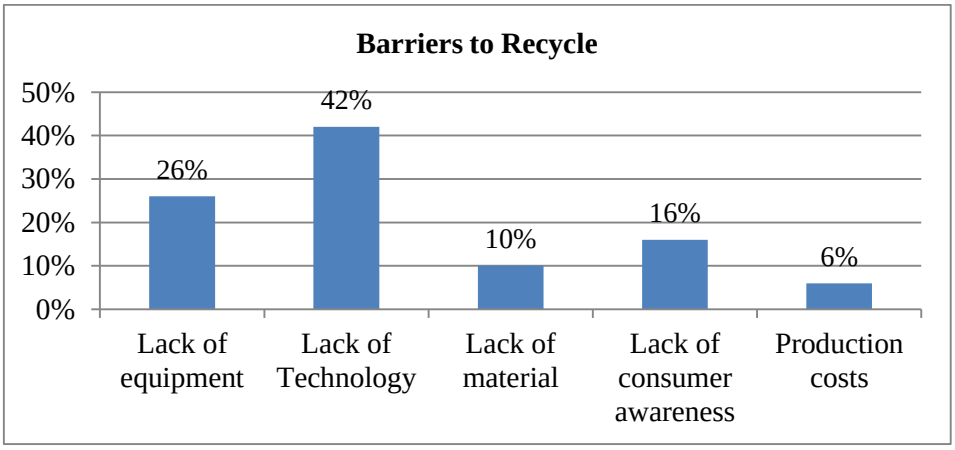

Figure 3: Barriers to Recycle

3.3 Pricing Strategies

The pricing of recycled materials must be compatible with product quality to sustain the market. Due to high production costs, the prices of recycled goods remain high. The opinions about pricing from the various organizations represented below.

Table 3. Details about recycled product compared to product from new raw materials

What would be the price of recycled product compared to product from new raw materials?		
Response	**Frequency**	**Percentage**
Low end	7	14%
Low to moderate	21	42%
Moderate	16	32%
Moderate to high	4	8%
High	2	4%

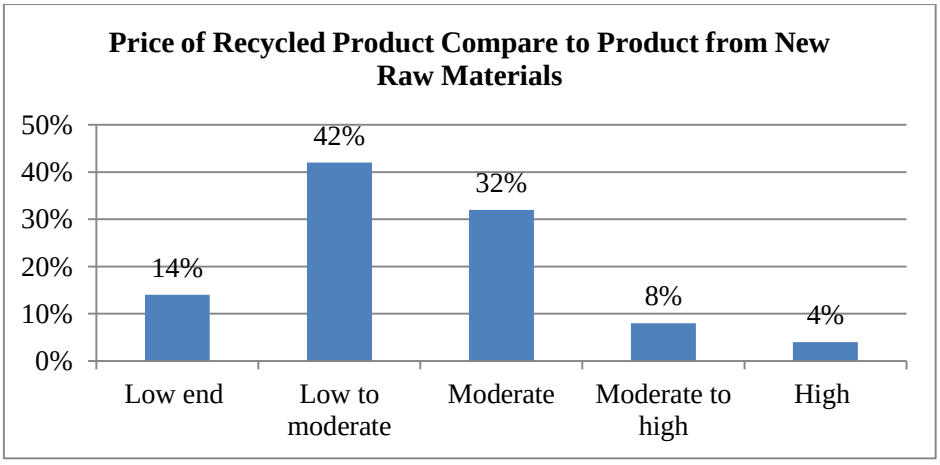

Figure 4. Price of Recycled Product Compare to Product from New Raw Materials

3.4 Promotional Strategy

About 38% were agreed about similar costs regarding promotion; while slightly less and slightly more costing was recommended by 26% and 18% respectively to compensate profit margin. About 12% of the respondent thought that the promotional cost would be significantly less whereas 6% of the respondent thought that the promotional cost would be significantly more than the product from new raw materials.

Table 4. Promotion Cost of Recycled Product Compared to Product from New Raw Materials

What would be the promotion cost of recycled product compared to product from new raw materials?		
Responses	**Frequency**	**Percentage**
Significantly less	6	12%
Slightly less	13	26%
About the same	19	38%
Slightly more	9	18%
Significantly more	3	6%

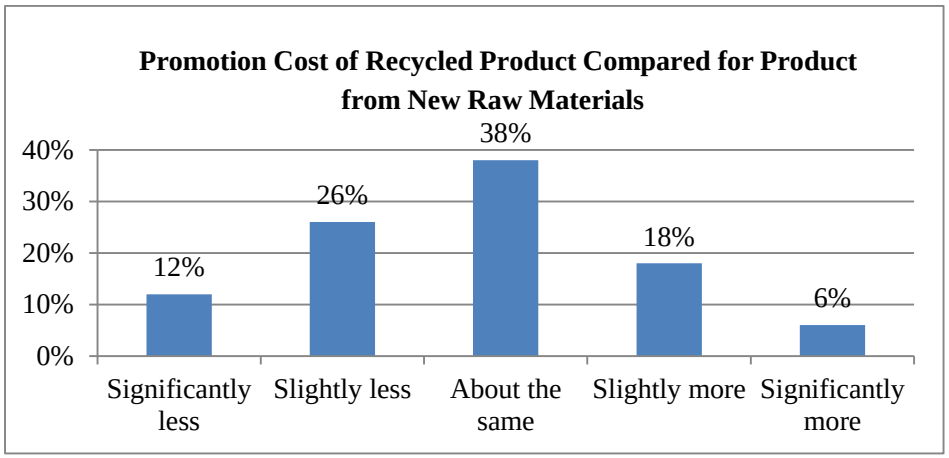

Figure 5. Promotion Cost of Recycled Product Compared for Product from New Raw Materials

3.5 Environmental Issues of Solid Waste Disposal

The material to which we call solid waste among them fabric pieces, jhuts, and paper bags are important. Cotton-based fabrics are usually biodegradable and others made of non-biodegradable materials sustain on the earth for many years that cause soil pollution. Such non-biodegradable materials are polythene, polyester etc. can sustain for more than 500 years in the soil and highly detrimental to the fertility of land. The paper bags which are used for packing the garments are biodegradable. Nearly 10% were positive regarding thus case of environmental issues while 22% think it's not much detrimental. But almost (44%) respondents claimed it as harmful. But only a few (6%) were more cynical that they declared it as highly harmful to environment. Among these problems some shows us hope that the solid waste can be bio degradable and their number is about 18%.

Table 5. Details about environmental issues of solid waste

How much extent it is harmful if it is thrown away in the environment?		
Response	**Frequency**	**Percentage**
Degradable	9	18%
Less harmful	5	10%
Moderately harmful	11	22%
Harmful	22	44%
Hazardous	3	6%

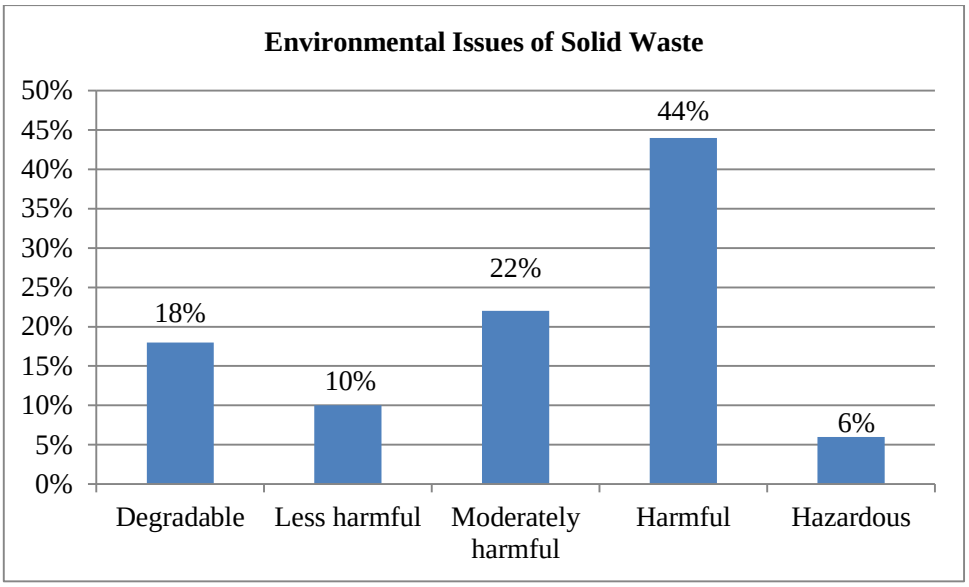

Figure 6. Environmental Issues of Solid Waste

4. Conclusion

Management of wastes becomes an essential part of the garments factory.With the growing production of finished products, solid wastes are generating in significant quantity with the potential to pollute the environment. For maximum utilization of wastes, an ideal waste management system must be practiced to make this sector beneficial. Large scale and efficient recycling needed to be practiced so as to meet the increasing solid wastes. An efficient recycling method will provide opportunities to maximum wastes recycling and utilization.

Conflict of interest

All authors are confirming that there is no conflict of interest of this work.

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