

A Study on Waste Management and Minimization in Ready Made Garments (rmg) Industry

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Abstract

The exigency of garment waste reducing, recycling and disposal management is motivated by the increasing cost and decreasing availability of dumping area and the diminish of natural resources. The raw materials in various combinations undergo different processes during production and are converted to finished goods. The residue left out after each process during production remains waste. The aim of this study was to identify the current solid waste reducing, recycling and disposal practices of the ready made garments industry and to determine their attitude and willingness towards recycling, their perception of the feasibility thereof, barriers to recycling and marketing strategies that would be appropriate for products made from recycled materials. Waste Management is the human control of the collection, treatment and disposal of different wastes. Some components of waste have economic value and can be recycled once correctly recovered. The most important barriers to recycling are lack of equipment and technology, lack of materials to recycle and lack of consumer awareness. The compositions of different wastes have varied over time and location, with industrial development and innovation being directly linked to waste materials.

Keywords: Garment Industry; Garment Waste; Waste management; Waste Recycling.

1. Introduction

Waste is directly linked, both technologically and socially, to the human development. Waste management practices can differ for developed and developing nations, for urban and rural areas, and for residential and industrial manufacturers or producers. This is in order to reduce the negative impacts of wastes on environment and society.

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Environment protection could be achieved by adopting state-of-the-art technologies to minimize waste generation, effective treatment of effluent so that the effluent discharge conforms to the expected norms, and recycling the waste several times before dispose or discharge. Textile manufacturers undertake a range of waste-generating activities such as washing/drying, warp preparation, weaving, dyeing, printing, finishing, quality and process control, and warehousing. The major wastes generated by this sector are fibre wastes. These include soft fibre wastes, yarn spinning (hard fibre) wastes, beaming wastes, off-cuts, packaging, spools and creals.

2. Concept of Waste

Simply waste is purchased raw materials those are subsequently not sold as product. It is an unwanted material or substance; also treated as trash, garbage, rubbish etc. depending upon the type of materials [1]. Waste could be explained easily by the following simple production flow diagram (**Figure-1**). Many manufacturers of ready made garment industry accept waste as a normal cost of business.

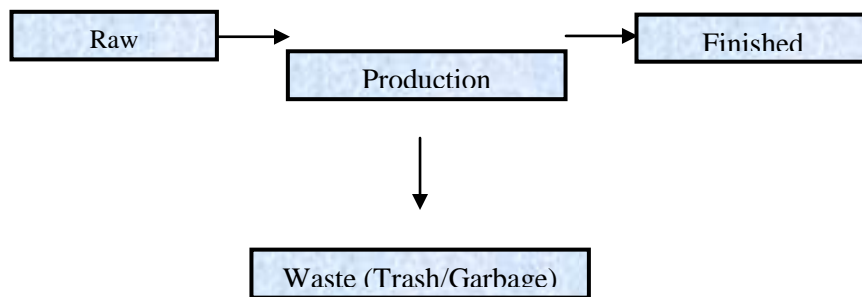


Figure 1: Production Flow Diagram

3. Various stages of wastage in garment industry

The stages of wastage in the point of view of a ready-made garment industry can be described as the flow chart of **Figure-2** [1].

3.1 Fabric Store

Inspection of the incoming fabric is very important. Fabric storehouse is the right area where the fabric for production is received or dispatched for production. The fabric which is sourced from the outside into the store house should be inspected for defects.

3.2 Wastes in the Cutting Room

In the cutting room, wastage can be occurred from several sources, such as

- ✓ Marker utilization;
- ✓ Cutting waste;
- ✓ Roll surplus etc.

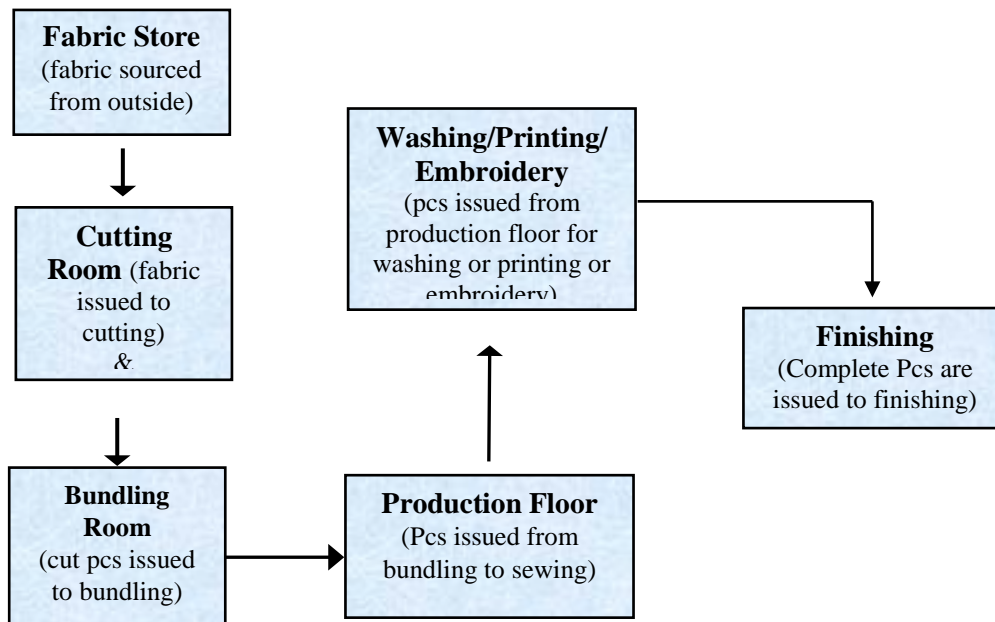


Figure 2: Stages of wastage

3.3 Bundling Room

The inspection is not 100%, some defective pieces go undetected and reach the stage of production.

3.4 Production Floor

The lines are loaded by the loaders with the bundles which pass on the line according to the operation.

The operator may find the piece defective at any stage and dispose it off there and then only.

3.5 Washing, printing or embroidery

The wastages happen when either the pieces are lost or misplaced during the transportation for washing, dying, printing or embroidery.

The printing on the garment does not match the standard while in the case of embroidery, it may not be on the correct place on the garment or the number of threads used is less and desired effect is not obtained.

3.6 Finishing

This may include measurement/fit defect, trims defect or pressing.

We can simplify the various stages of wastage, specially during production can be listed as below (Table-1) :

Table 1: Various stages of wastage during production

Sample Production	<ul style="list-style-type: none"> ▪ Mistakes in design communication. ▪ Craftsmanship problems.
Cutting Floor	<ul style="list-style-type: none"> ▪ Wrong color of shades ▪ Fabric faults.
Sewing	<ul style="list-style-type: none"> ▪ Problems in sewing machines.
Outsourcing	<ul style="list-style-type: none"> ▪ Printing, dyeing, embroidery.
Final Inspection	<ul style="list-style-type: none"> ▪ Finishing/Ironing problems, measurement faults, size mistakes etc.

4. Reasons of wastage

The main causes of wastage in garment industry can be stated below :

- In efficient, obsolete and conventional technologies.
- Motion.
- Delay/waiting.
- Lack of technical skills and awareness in terms of quality.
- Over processing
- Over production
- Inventory

5. Concept of Wastage management

The concept of wastage management can be shown as following pyramid (Figure-3) [2]:



Figure 3: Concept of wastage management

Benefits of managing wastage

As the growth of population and high consumption of products in the developed world, the global waste problem is increasing day by day. We are producing more waste than the environment can absorb. The benefits of managing waste are given below :

- ✓ Saving resources and energy;
- ✓ Reducing pollution;
- ✓ Increasing the efficiency of production.

6. Waste minimization

Waste minimization means, preventing the waste from occurring in the first place, rather than treating it once it has been produced by end-of-pipe treatment methods. That is, it is a technique that can be applied to all inputs to and outputs from, a process.

According to **Environment Wise Governance Guide**, “Waste minimization aims to eliminate waste before it is produced and reduce its quantity and toxicity. Prevention is the primary goal, followed by reuse, recycling, treatment and appropriate disposal” [3]. Waste minimization can be defined as “Reducing waste at source technically and a systematic way”, which means:

- ✓ Prevention and reduction of waste generated;
- ✓ Efficient use of raw materials and packaging;
- ✓ Efficient use of fuel, electricity and water;
- ✓ Improving the quality of waste generated to facilitate recycling;
- ✓ Encouraging re-use, recycling and recovery.

Waste minimization or prevention is important than waste treatment, because waste minimization has some benefits as mentioned below :

- ✓ Waste quantities are reduced;
- ✓ Raw material consumption and therefore costs are reduced;
- ✓ Waste treatment costs are reduced;
- ✓ Process efficiency is improved;
- ✓ Efficiency of the employee is improved

7. Waste management principles (WMP)

One can control the waste not only from garment industry but also from any type of organization, by following two waste management principles [4]:

(A) General Waste Management Principles

(B) Some special waste management principles

We can illustrate above classification of waste management principles in the following diagram (Figure-4):

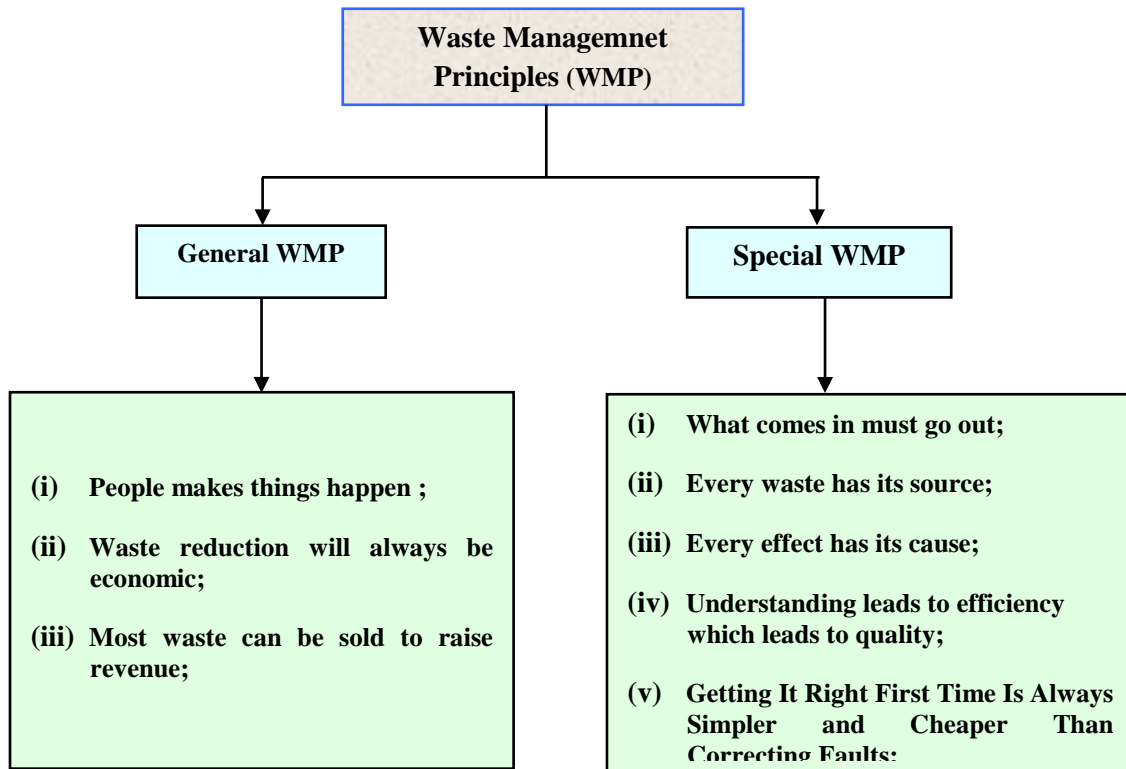


Figure 4: Waste Management Principles

8. Measures to control cost lost in wastage

In order to control cost lost wastage, the following measures must be kept :

- ✓ Finish in time Minimum
- ✓ Changes in original design
- ✓ Least make break/rework
- ✓ Keep check on Labor and Material costs
- ✓ Avoid rework due to bad quality
- ✓ Optimize usage of materials
- ✓ Enhance labor productivity through skill training
- ✓ Efficient Management Information System (MIS) for timely decision making.

9. Improvement of waste management in garment industry

For the economic conditions or barriers the reuse is limited with low cost of textile and fast changing fashion. There are however opportunities in that second hand may be a fashion in itself and that the informal second hand market is to a large extent working without any specific policy instruments.

Much of the textiles collected by charity organizations are not of a sufficient quality to be sold and reused on the market. This is to some extent solved by exports to less demanding markets outside but also leads to incineration. So the improvement of waste management in garment industry can be viewed mainly two sites [5]:

9.1 Economic & Social

The labour cost of repairing a garment is often higher than the purchase of a new garment. The extreme case is when it is actually cheaper to buy a new garment rather than to have it professionally cleaned.

9.2 Technical, Legal: Design both for Reuse and Recycling

Design of new textiles can be differentiated depending on what the textile should be used for. If it is a short lived garment either due to fashion or its inherent nature it should preferably be made of a standardized material which is suitable for recycling. If it is a high quality garment which will be used for many years a more complex fabric may be used in technical.

10. Zero waste concept

A **Zero** waste strategy will lead to faster innovation and movement far beyond incremental approaches that don't include an end point goal. The zero waste strategy leads us to look for inefficiencies in the use of materials, energy and human resources.

To achieve a sustainable future, extreme efficiency in the use of all resources will be required in order to meet the needs of all of the world's inhabitants. A zero waste strategy directly supports this requirement [6].

The zero waste strategies have been adopted by large and small business and by both foreign and domestic governments. The results have included increased profits resulting from significant cost saving, improved environmental performance, and stronger local economies. The result will be economically healthy organisations, healthy communities, and healthy environment for future generations. Zero waste strategies support all phases of the sustainability movement includes,

- ✓ Save money
- ✓ Faster progress
- ✓ Economic well-being
- ✓ Supports sustainability
- ✓ Environmental protection
- ✓ Social well being
- ✓ Improved material flows

11. Use of garments waste

The unusable parts of clothes are recycled into waste cotton. Mattress, pillows, cushions, seat stuffing and

padding in cars and rickshaws are usually done with these recycled clothes and processed cotton. Bbandages are also reproduced with leftover white cotton fabrics. While buttons, zippers, elastic fastener, hangers and plastic bags are resold to mini garment accessory sellers. Buttons, zipper, elastics fasteners are mostly purchased by local tailors, said an accessory seller.

12. Environmental and economic benefits of garment recycling

Garment recycling have essential benefits in terms of environmental as well as economical. Some are mentioned below :

- ✓ Reduces the need for landfill space.
- ✓ Reduces pressure on virgin resources.
- ✓ Aids the balance of payments as we import fewer materials for our needs, which causes less pollution and energy savings, as fibers do not be transported from abroad.
- ✓ Benefits of reclaiming fiber Savings on energy consumption when processing, as items do not need to be re-dyed or scoured.
- ✓ Less effluent, as unlike raw wool, it does not have to be thoroughly washed using large volumes of water.
- ✓ Reduction of demand for dyes and fixing agents and the problems caused by their use and manufacture.

13. Conclusion

Waste management has essentially become very important in garments industry. Garment waste is not a large waste stream by weight or volume but has a significant environmental impact connected to the production of garments. Proper production planning and control should be strengthened inside the organization. Management of waste in garments industry is result in increase the economy of the industry. Industrial recycling needs to be large scale and the textile flows are according to the recycling company's too small for an efficient recycling process. More research is needed to find optimal recycling methods.

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