waste management implementation in textile industry & waste impacts on the environment

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Abstract:

Egypt is well-known in the world not only for its old heritage but also for its valued presence in superior quality of textiles. However, the textile industry is highly polluting industry. The production of textiles often emits large quantities of pollutants to the environment. Therefore, it is very important to minimize its impact on the environment by stablishing a proper waste management system. The present study is dealing with developing a "Waste Management System" and implementing it in a real situation. The system was established as a continues improvement cycle, waste management system started with defining waste, Waste classification, waste segregation, company policy of reducing waste & dealing with waste, commitment of top management for better handling waste procedures. The established policy focused on reducing solid waste generated in form of waste fiber, fabrics, cartons, plastics, empty containers, the system included: formation of a waste management team, data collection, monitoring reports and audits. An action plan with specific goals was created based on recommendations of the waste management team, and related cost savings were calculated & waste reduction practices applied.

The implemented actions reflected a direct reduction in waste generation, consequently provided large cost savings.

The investigation revealed that the applied waste management system is an effective tool for minimizing waste generation, reducing negative impact of textile production on the environment and enhance cost savings. Furthermore, the followed waste management system in this study can be implemented in similar industries.

The waste created in the textile and garment industry consists of fabrics and trims—including buttons, embroidery threads, and other adornments. It is estimated that 10-25% of fabric is wasted during cutting process. Waste can be happened because of misprints and embroidery mistakes. If the printing and embroidery is done efficiently, it can help eliminate textile waste to a great extent.

The cutting floor waste can be generated because of wrong sample making, sewing waste from poor craftsmanship, and finishing process waste from dyeing and embroidery can be eliminated by good craftsmanship and care. Correct estimation of fabric consumption can help reduce waste by avoiding of orders of excess fabric quantities.

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.

الملخص:

إن صناعة النسيج صناعة ملوثة للغاية. غالبًا ما ينتج عن إنتاج المنسوجات كميات كبيرة من الملوثات إلى البيئة. لذلك ، من المهم جدًا تقليل تأثيرها على البيئة من خلال إنشاء نظام مناسب لإدارة النفايات. تتناول الدراسة الحالية تطوير "نظام إدارة النفايات" وتنفيذه في الواقع. تم إنشاء النظام كدورة تحسين مستمرة ، يبدأ نظام إدارة النفايات بتعريف النفايات ، تصنيف النفايات ، فرز النفايات ، كيفية التعامل مع أنواع مختلفة من النفايات وتضع المنظمة سياسة للحد من النفايات والتعامل مع النفايات، وكيفية التخلص منها للحد من أثارها السلبية ويحدد مدى التزام الإدارة العليا للتعامل بشكل أفضل مع إجراءات النفايات.مدى نجاح نظام إدارة النفايات المقترح و ركزت سياسة التعامل مع النفايات على تقليل النفايات الصلبة المتولدة فى شكل نفايات الألياف والأقمشة والخيوط والكرتون والبلاستيك والحاويات الفارغة ، ويشمل النظام: جمع البيانات وتصنيفها وتقارير المراقبة والتدقيق.

و تم وضع خطة عمل ذات أهداف محددة بناءً على توصيات فريق إدارة النفايات ، وتم حساب الفوائد المالية بعد تطبيق ممارسات الحد من النفايات. وعكست الإجراءات المنفذة انخفاضًا مباشرًا في توليد النفايات وتقليل أثارها الضارة على البيئة و العاملين بالمؤسسة ، مما أدى إلى توفير كبير في التكاليف. أظهرت النتائج أن نظام إدارة النفايات المطبق هو أداة فعالة لتقليل توليد النفايات، ويعمل على تقليل التأثير السلبي لإنتاج المنسوجات على البيئة وتعزيز توفير التكاليف. علاوة على ذلك ، يمكن تطبيق نظام إدارة النفايات في هذه الدراسة في صناعات مماثلة.

وتتكون النفايات الناتجة في صناعة النسيج والملابس من الأقمشة و الزخارف المكونة للموديلات المختلفة ـ بما في ذلك الأزرار وخيوط التطريز وغيرها من الزخارف. و يقدر أن ١٠-٢٥٪ من القماش يضيع أثناء عملية القطع. يمكن أن تحدث النفايات بسبب الأخطاء الفنية و. إذا تم إجراء الطباعة والتطريز بكفاءة ، فيمكن أن يساعد ذلك في التخلص من نفايات النسيج إلى حد كبير، ويمكن التخلص من نفايات عملية التجهيز من الصباغة والتطريز عن طريق التدريب المستمر للعمال والعناية الجيدة. و تختلف ممارسات إدارة النفايات بالنسبة للدول المتقدمة والنامية ، والمناطق الحضرية والريفية ، هذا من أجل تقليل الآثار السلبية للنفايات على البيئة والمجتمع.

الكلمات المفتاحية

إدارة المخلفات ، معالجة المخلفات ، فصل المخلفات ، المخلفات الصلبة ، مخلفات صناعة النسيج

Introduction:

With increasing production of textile products, textile industries (TIs) are generating a considerable amount of liquid and solid wastes which bring in many adverse impacts on the environment such as landfill occupation, contamination of air, soil, surface water, and groundwater. **(1)** Waste is directly affecting the human world socially, technologically, economically, and environmentally. It is essential to manage solid waste to ensure environmental protection and protect natural resources for future generations. This paper focuses on significant waste generation activities in the textile industry, basic waste management concepts used in the textile industry to implement a proper waste management system, waste management techniques, global market demand for recycled and upcycled textile products, and negative impacts on the environment from waste. It is essential to have discussions, researches, specific studies, and inventions to reduce the impact of waste on the environment. **(2)**

Every textile material has an end. The growing population demands more clothing which is estimated to be 99 million tons per annum which cannot be met completely by natural fibres. **(3)**

In the textile industry, there are two significant paths to generating waste. The first path is all the production processes that create waste and the second path is employee activities that make different types of wastes. Identifying these two paths is the key to solid waste management in the textile industry [1]. In large-scale textile industries, there are thousands of employees working inside the industry. So individually, a considerable amount of solid waste is generated by them. It is essential to capitalize on those areas to identify the waste generating activities in the industry. **(2)**

Waste is directly linked, both technologically and socially, to the human development. Waste management practices differ for developed and developing nations, and industrial manufacturers or producers. This is in order to reduce the negative impacts of wastes on environment and society. **(4)**

Environment protection could be achieved by adopting technologies to minimize waste generation, effective treatment, 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. The major wastes generated by textile sector are fiber wastes. **(4)**

Aim of the work (the research problem):
The aim of the presented research is:
- **How can industrial waste and the effects of environmental pollution be reduced to achieve sustainability?**
- **How can we benefit form waste & waste recycling & reuse?**
- **How we can minimize waste quantity?**
- **What is the best management practices that help to minimize the garbage and scraps?**
- **How to reduce pollution effect?**

A lot of garbage is generated daily, it's critical to treat waste & protect the environment, recycling services become expensive, but there are ways to save on these expenses such as:

Minimize Waste
Proper management practices help minimize the garbage and scraps, which means minimizing the amount of waste produced.

Reduce Pollution Effects
Activities to lower pollution, methane gases, greenhouse effect that warms the planet.

Ensure Sustainability

Use natural resources, which reducing money & save the environment, practices help to protect nature get balance between the environment and businesses. Create economic benefits & protecting the environment. **(9)**

The objective of waste policy is to reduce the greenhouse gas emissions generated by waste, by reducing the methane emissions. This can be achieved by reducing amount of waste generated & increase the recovery rates of methane generated. **(10)**

Research boundaries:

The research is applied on one of the ready-made garment facilities in Egypt during 2022.

Concept of Waste

Waste is material or substance which is undesired to be sold as a product and treated as being trash. Depending upon the type of materials, manufacturers accept waste as a normal cost of business. **(4) Also,** waste is any material or substance that is discarded from a factory site, which can pollute and contaminate the environment and surrounding communities. **(17)** Waste is a product or substance which is no longer suited for its intended use. **(11)** Management for non-hazardous commercial and industrial waste is the responsibility of the generator of waste. **(6)** Classifying waste based on risks related to the environment and human health, collection and analysis of waste as well as in domestic or industrial waste. **(11)**

The types of industrial waste generated includes textile waste, oil, solvents, chemicals, empty chemical containers, these types of wastes are divided into hazardous and non-hazardous waste. **(12)**

Example of waste

Waste can include, but not limited to:

● **Non-hazardous waste** is discarded materials from the consumption of goods and services and the manufacture of goods. Non-hazardous waste includes non-hazardous production waste is generated from manufacturing process directly, e.g., cloth, leather, plastic, paper, metal or packaging waste. Domestic waste includes food and sanitary waste: Food waste is generated from facility canteens & sanitary from office and toilets, **(17)**. Industrial waste may be toxic, ignitable, corrosive, this waste is dangerous to human health and is considered environmental. **(12)**

● **Hazardous waste** is waste that could cause harm to public health and the environment because of its chemical, physical, or biological characteristics (e.g., it is flammable, explosive, toxic, radioactive, or infectious). Defining hazardous waste as "waste that is dangerous or potentially harmful to our health or the environment, liquids, solids, or gases, or sludge. The needs of managing hazardous waste are more important than non-hazardous waste **(17), also h**azardous waste resulting from industrial processes. **(12)**

Hazardous solid wastes from the industry and disposed in the ground can influence the quality of groundwater and surface waters, Waste treatment or disposal systems themselves can directly impact the quality of the air, water, or ground. **(13)**, textiles paints and dyes, plastics are hazardous waste, including toxic chemicals & must be managed with care to avoid adverse

environmental or human health impacts, the impacts of many of these chemicals are largely unknown. High levels of toxic contaminants have been found in animals and humans. **(21)**

Examples of hazardous waste generated by industries activities & businesses
Table 1. different kinds of hazardous waste generated by different activities in industry

Waste generator activity	Waste type
Chemical manufacturers	-Spent solvents -Wastewater containing -Acids & bases -Reactive waste -Organic constituents
Petroleum refining industry	-Wastewater contains -Hydrocarbons -Benzene & other -Sludge form refining process
Paper industry	-Paint waste containing -Ignitable solvent -Heavy metals
Metal manufacturer	-Sludge containing -Cyanide waste -Heavy metals -Paint waste
Printing industry	-Heavy metal pollution -Solvents -Heavy metals -Waste Inks -Ink sludge containing
Leather products manufacturing	-Toluene & benzene
Construction industry	-Ignitable paint waste -Strong acids & bases -Spent solvent

Table 1 shows some different kinds of hazardous waste generated by different activities in industry.
Source: Environmental protection agency, solving the hazardous waste problem, www.safewater.org/fact-sheets-1/2017/1/23/industrial-waste (12)

Various Stages Of Wastage Management In Garment Industry
Fabric Store
Waste from inspection of received goods. & waste form fabric defects.
Wastes in the Cutting Room
Come from marker utilization, cutting waste and roll remaining.
Bundling Room
Defective pieces form inspection before production.

Production areas

Defected bundles passed to the line for operation. Defected pieces found by the operator at any stage and disposed off.

Dyeing and Washing

The waste form dyeing & washing processes.

Printing/Embroidery

The waste form dyeing & washing processes, such as samples does not match the standard in color, position, machine defect, worker defect.

Finishing

Measurement defect, trims defect or pressing. **(6)**

Table 2. Waste generated in the clothing production processes. (18)

Stages	Generated waste
Material stock	Defective parts; thread; labels; fabric scraps, zippers
Cutting	Paper; fabric scraps, machine metal parts
Preparation	Fabric scraps, threads
Sewing	Fabric scraps threads; plastic cones; needle; trims
Finishing	Fabric scraps; thread; trims; labels; plastic; paperboard
Packing	Plastic; paper, packaging materials; adhesive tape
Collection planning	Fabric scraps; defective parts; packing; printer cartridges, paper, paperboard
Design	Plotter pens; metal clips; paper; paperboard

Table 2 shows the stages of the production cycle, and their waste generated and identified is presented as follows: (i) Collection planning, (ii) material stock, (iii) design, (iv) folding, (v) cutting, (vi) preparation for sewing, (vii) sewing, (viii) finishing, (ix) packing, and (x) shipping. Paper is a waste generated at all stages of production processes [10].

Table 3. Waste, ways of storage and destination (18)

Generated waste	Storage	Destination
Fabric scraps & threads	Fabric scrap area	Specialized company/ sold
Plastic cones	Plastic bags Area	Sold to yarn and thread producing company.
Cartridges/toner/printer pens / sharp edges / metals/ hazardous trims	Hazardous waste area	Landfill
Paper; paperboard	Paper & cardboard waste area	Specialized company/ sold

Table 3. Shows waste generated form textile processing production process (storage/destination /reuse/recycling form).

Table 4. Kind of wastes generated by the facility & way of dealing with waste

S.	Kind of waste	How to deal with waste (Reuse / Recycling/ Safe disposal)	Hazardous / Non hazardous
1	Yarn waste	Reuse/ recycled by winding	Not hazard waste
2	Finishing waste	Reuse/ recycled of finishing materials	Hazard waste

3	Domestic waste	Bio-fuel treatment.	Not hazard waste
4	Sharp waste & broken needles	Recycling for steel manufacturing.	Hazard waste
5	Medical waste	Removed by specialized medical waste treatment contractor.	Hazard waste
6	Sludge	Heat treatment in cement industry.	Hazard waste
7	Chemical drums waste	Reuse in refill with new chemicals landfilled	Hazard waste
8	Used oil & grease	Recycling by Petro trade (oil supplier)	Hazard waste
9	Used car wheel	Recycling by car wheel producer	Hazard waste
10	Fluorescent lamps	Landfill	Hazard waste
11	Used batteries	Landfill	Hazard waste
12	Packaging materials (Cartons & paper)	Recycling by paper & cartons companies	Not hazard waste
13	Plastic waste	Recycling by plastic companies	Not hazard waste
14	Wastewater	Waste water treatment planet which removes hazardous waste form waste water before releasing to municipality drains.	Hazard waste

Table # 4 shows the different ways for dealing with waste depends on the kind of waste

Waste Management In Textile Industy

The objective of implementing an environmental management system is to reduce waste generation from production in all processes, inefficient energy consumption, water consumption, and toxics release to the environment, and pollution levels, both corrective and preventive actions implemented when needed. **(5)**

Waste performance

1. Reducing the total amount of waste generated.
2. Best disposal methods of waste disposal (recycling, reuse).

Tracking waste data

Effective implementation of an environmental management system in textile plants enhance the usage of the end product & waste tracking, & help in re-design the products for the best use of materials, which leads to cost reduction, and waste reduction. **(5)**

Increasing textile reuse and recycling move the treatment of textile waste further up in the waste hierarchy, thus reduce environmental impact. **(14)**

The Higg Index Waste section requires you to:

● Understand hazardous & nonhazardous waste tracking.

● Report waste volume generated and disposal method.

● Segregate, properly store, and train workers to handle all hazardous and non-hazardous waste.

● Forbid open burning and dumping.

● Set normalized baselines for waste generated.
● Set normalized targets for waste reductions and improvements.
● Set an action plan with specific actions and strategies to achieve targets
● Demonstrate waste reductions against the baseline.
● Leading practice in environmental improvements & waste reductions.

Solid waste disposal practices

In the apparel industry: Recycling/reuse improves financial profitability & solve economic problems, which turn in impact on the profitability as raw materials & waste disposal becoming more and more expensive.

Global resource consumption is growing, coupled with waste generation growing, increasing the need for recycling, waste is a primary environmental concern & most of apparel cutting waste is dumped in landfills.

Some manufacturers sell fabric waste in various forms. The importance of the sorting of waste and the fact that the waste should be in a good condition and free of foreign objects in order to ensure that waste is not viewed as garbage but rather as a valuable commodity is emphasized.

This author also reports that those firms who sell their fabric waste are more likely to package it in boxes or bales than to bag or bundle it. **(8)** When establishing a waste tracking and reporting program, the following principles should be applied:

● **Completeness:** Tracking and reporting program should include all relevant sources.

Accuracy - Ensure that the data input into the waste tracking program is accurate.

● **Consistency** - Use consistent methodologies to track waste data.

● **Transparency** – All data sources, assumptions used, and calculation methodologies are readily verifiable.

● **Data Quality Management** – Quality assurance activities are defined and performed on waste data. **(17)**

Collection of Textile Waste

Innovation and changes in both production and consumption models, and to extract their highest value, materials should re-enter the economy after use instead of just being discarded. There are several ways to do so, for example repair products if they are broken, reuse, remanufacture or recycle them. Whichever method is applied, collection of the materials is essential.

Waste minimization (4)

Waste minimization means, preventing the waste from occurring in the first place, rather than treating it once it has been produced, "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 includes:

☐ Prevention and reduction of waste.
☐ Efficient use of raw materials.
☐ Efficient use of fuel, electricity.
☐ Improving the quality of waste generated.
☐ Encouraging re-use, /recycling.

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 costs reduced.
 Waste treatment costs are reduced.
 Process efficiency is improved.
 Efficiency of the employees improved.

Improvement of waste management in garment industry (4)
There are opportunities in the second hand may be a fashion in itself and that the informal secondhand market, much of the textiles collected by charity organizations are not of a sufficient quality to be sold. This is to some extent solved by exports to less demanding markets outside. **(4)**

Zero waste concept
The zero-waste strategy leads us to look for inefficiencies in the use of materials.
To achieve a sustainable future, extreme efficiency in the use of all resource will be required in order to meet the needs of the market. A zero-waste strategy directly supports this requirement.
(4)
The zero waste strategies adopted by large and small business and by both foreign and domestic governments. The result includes increased profits, improved environmental performance, and stronger local economies. The result will be economically benefiting as below:

 Save money
 Faster progress
 Economic well-being
 Supports sustainability
 Environmental protection
 Social well being
 Improved material flows **(4)**

Environmental impacts of textile waste
Waste from the textile industry raises many environmental concerns, & negative impacts, Pollution prevention and waste minimization techniques in the textile industry were illustrated. Environmental management systems (EMS) are implemented in order to reduce redundant production procedures, EMS adopted by firms monitor waste and pollution levels. Effective implementation of EMS enhances the utilization of raw materials, & leads to cost reduction, improvement in textile quality, and waste minimization. **(13)** Waste generation and diversion situation: Landfilling is the dominant form of waste management, textiles in landfills depends on fibre material, textile materials, & the bulk of material will remain in landfills indefinitely. **(18)**
To keep textiles out of the landfills: Textile waste is not generally considered a 'problem' in waste management, because, although materials are made with a range of chemicals, they are generally not considered toxic, in that they do not raise problems in the same way as batteries,

tires or light bulbs. As a result, most municipalities do not collect textiles, leaving collection to charity organizations and private companies. **(15)**

Textile reuse and recycling in general reduce environmental impact compared to incineration and landfilling, and that reuse is more beneficial than recycling**. (14)**

Negative impact of waste on the industry and environment impact on industry

The generation of waste in the textile manufacturing process is a significant challenge facing the industry, Increasing the percentage of waste generated also increases energy loss. It requires extra effort, energy, and cost to transport, dispose and adequately manage the generated waste. **(4)**

Environmental life Cycle Assessment

Environmental LCA is a system analysis tool: It was developed rapidly during the 1990s and has reached a certain level of harmonization and standardization. An ISO standard has been developed, as well as several guidelines.

LCA studies the environmental aspects and potential impacts throughout a 'product' life from raw material acquisition through production, evaluating the potential impacts of those inputs and outputs (the impact assessment), and interpreting the results (the interpretation) in relation to the objectives of the study. **(16)**

LCA methodology is used to analyze and to evaluate different alternatives that can be implemented to enable the targets required & aim to reduce the amount of biodegradable municipal wastes going to landfill. **(16)**

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.
- ☐ Reduction of demand for dyes and fixing agents and the problems caused by their use and manufacture. **(4)**

Waste treatment plan (recycling-reuse)

Political action is imperative in order to advance the implementation of waste management principles and sustainability, worldwide, some countries have organized collection, segregation, recycling, disposal and monitoring systems **(18).**

Channels for clothing reuse, recycling and disposal Literature on the range of channels for textile disposal generally mention resale, donation, reusing and discarding. (20)

Disposal in this context does not include recycling or composting. Instead, reuse, recycling and disposal are channels for consumers to manage unwanted garments.

The generation of textile waste in production processes of the industries surveyed is considered moderate, and respondents reported that they aim at reducing this amount through the acquisition of new technologies, especially within the cutting and modelling sectors. Regarding

knowledge of the steps to the final destination, managers inform they are not aware of the treatment and disposal of materials as waste, because they are arranged to be collected, and then an outsourced specialized company forwards them to the following steps, which were not informed by the respondents, given the fact that they do not know the procedures. **(18)**

Action taken by the facility for waste management

The methods and actions applied by the facility to manage waste from the beginning to the end are waste collection, transportation, treatment, and disposal, as well as waste management process monitoring and control, as well as waste-related laws, technologies, and economic systems.

The below action & policy applied by the facility for better management of waste file:

1. Wastage is piled in a permanent box on a daily base & after finishing the work carries that wastage outside to our unchanging garbage.

2. When goods are manufactured the remaining waste move toward other some small clothes, tread & other reject wastage kept a safe place.

3. This wastage was sold to local traders; traders convert cotton from these wastage & make necessary things not to be harmful to the environment.

4. Workers have sufficient knowledge to work & protection in safety side from that's harmful side because they are well trained.

5. The factory does not use harmful chemicals & workers are conscious to use, chemical warehouse is separate from other items.

6. Old tube lights & other discarded materials are sold or sent to landfill.

7. Medical consumption is kept in a cover box, things also are burnt out a predetermined place.

8. Cutting process simplified or improved, the waste generation can be reduced to a large extent, as garment manufacturing creates the largest amount of pre-consumer fabric waste.

9. Waste created in the textile and garment industry consists of fabrics and trims—including buttons, embroidery threads, and other adornments. It is estimated that 10-25% of fabric is wasted during cutting process, the printing and embroidery are done efficiently, it helps eliminate textile waste to a great extent.

10. More control for cutting floor waste generated to avoid wrong sample making, sewing waste from poor craftsmanship.

11. Waste from dyeing and embroidery can be eliminated by good craftsmanship and care.

12. Correct estimation of fabric consumption reduce waste by avoid orders of excess fabric quantities.

13. Systems in Production, system implemented waste reduced at sample making, fabric cutting, manufacturing, packaging, sewing and finishing levels.

14. Applying mass production & manufacturing large quantities of the same style in different colors or prints, as cutting and production is easier with efficient marker making.

15. Raising designers' technical skills like pattern making and fabric cutting, which results in decreased fabric wastage.

16. Buying the right width of the fabric suitable for production wide fabric.

Photo #1
Nonhazardous waste segregation

Photo #2
Hazardous waste containers

Photo #3
Waste segregation

Photo #4
Waste segregation

Photo # 5
Fabric waste area

Photo # 6
Fabric waste

Photo # 7
Carton waste

Photo # 8
Carton waste

Photo # 9
Hazardous waste chemicals

Photo # 10
Hazardous waste area

Photo # 11
Plastic waste

Photo # 12
Plastic waste

Dr. Eng. Osama Abd Elhameed Kawashty Hamzawy، waste management implementation in textile industry & waste impacts on the environment ،Maǧallaẗ Al-
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772

Photo # 13
Hazardous waste container

Photo # 14
Fabric waste

Photo # 15
Empty Containers

Photo # 16
Empty Containers

Photo # 17

Photo # 18

Photo # 19

Photo # 20

Photo # 21

Photo # 22

Photo # 23

Photo # 24

Conclusion

Pollution and harmful textile waste are increasing. Because a lot of textile release by several industries like garments, second-hand market, bales. Air, noise, water pollution is the most common environmental pollutions that can happen by textile waste. The waste management and characterization presented highlight possibilities for the promotion, arrangement and enhancement of textile waste that can become a source of raw materials in the market. Thus, this study can be used as a parameter for waste management projects, enabling a vision that promotes strategic actions which make processes viable and add value to the waste, thereby

reducing the disposal volume by considering the principles and objectives of solid waste management **(18)**

Sustainable developed waste management system is needed for textile industries. So, enterprises look forward to best waste management options for these industries. So, enterprises look forward to zero waste management options to develop textile waste management. So, the industries invest in Reuse, reduce and recycling and try to manage textile waste. & save worker working in waste form hazardous waste, as there are lots of employees work in the industry, by giving proper training and give the suitable PPEs for these workers to protect them and improving awareness, try to manage waste before they generate dealing with waste management.

The study provides useful information regarding characteristics of waste & proper disposal of waste, which may result in appropriate management actions to reduce clothing manufacturing impacts on the environment through knowledge of complete and concrete information on the quality and amount of textile waste. This knowledge supports the actions of project planning management, new storage possibilities, transport, treatment, reuse, recycling, recovery and final disposal of solid waste generated by clothing manufacturers industries. In addition, it can be understood as a matter of sustainability adopted by clothing manufacturing industries, promoting an economic reduction in the final product costs due to revaluation of materials

this study also provides more knowledge for activity often developed by companies and poorly investigated by researchers which is comprehensive field for research that can provide advances for business, society and the environment, & include proper management of waste, which reflect on costs. That discarded waste fabrics are great potential for creating money & reducing cost, so textile recycling plays a significant economic role in the global marketplace, and the textile industry can work to achieve economic scale by reducing its production cost through actions taken to improve waste management & the results obtained are as below:

- Waste management could be controlled from the facility.
- Best use waste management area, which reflect on the better use of the facility assets.
- Better waste management in waste segregation file, at the point of collection, which save waste segregation area.
- Segregated waste will be recycled later at other waste recycling production facilities.

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