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Textile Recycling: An Earth Saving Approach

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ABSTRACT

Textile recycling is the method of reusing or reprocessing used clothing, fibrous materials, and clothing scraps. Textiles in solid waste are mainly found in the form of discarded clothing, although other sources include furniture, carpets, footwear, and nondurable goods such as sheets and towels. Clothing and textiles have significant environmental impacts. The consumption habits of modern consumerist lifestyles are causing huge global waste problems. Waste generation per capita has increased and is expected to continue to increase with growing population, wealth, and consumerism worldwide. There is a growing realization of the negative impact of waste on the local environment (air, water, land, human health, etc.). Approaches for solving this waste problem in a scalable and sustainable manner would lead to the use of waste as an input in the production of commodities and value monetization, making waste management a true profit center. Recovery and recycling provide both environmental and economic benefits; thus, the recycling of fabric waste has become a major issue. Fabric waste management involves the collection of waste materials and follows a cycle of monitoring, collection, transportation, processing, and disposal or recycling to enhance the quality of life.

Key words: Textile waste, recycling, reuse, reduce

INTRODUCTION

For centuries, textiles have been developed and used for particular purposes. Originally, they were used to protect the user from cold, heat, and light and to preserve modesty of the wearer. However, over time, they have become a medium for expressing personality, wealth, or

interest in fashion. Currently, our industrialized society uses textiles for a wide range of purposes other than garment making. As consumers continue to buy, waste will continue to be created, further compounding the problem of what to do with discarded packaging, apparel, and home textile products.

The juxtaposition of a throw-away society with the realization that natural resources are threatened is a vivid illustration of the perplexing problem of contemporary lifestyles. Considering the case of textile and apparel recycling, it becomes apparent that the process impacts many entities and contributes significantly, in a broader sense, to the social responsibility of contemporary culture. At the same time, it contributes to the goodwill associated with environmentalism, employment for marginally employable laborers, donations to charities and disaster relief, and the movement of used clothing to areas of the world where clothing is needed.

Waste Management is becoming one of the key problems of the modern world, an international issue that is intensified by the volume and complexity of domestic and industrial waste discarded by society. Unfortunately, many of the practices adopted in the past were aimed at short-term solutions without sufficient regard or knowledge of long-term implications on health, the environment, or sustainability, which, in many cases, has led to the need to take difficult and expensive remedial action.

With our growing awareness of the detrimental environmental effects of current waste disposal, there is a significant need for effective waste management. Better practices and safer solutions are required. There is a need for more research on current disposal methods such as landfilling, incineration, chemical and effluent treatment, recycling, waste minimization, clean technologies, waste monitoring, public and corporate awareness, and general education.

The textile industry is among the most essential consumer goods industries. Everyone

needs garments and other textile products such as footwear and bags. However, the textile industry is also accused of being one of the most polluting industries. In addition to the production of textiles, their consumption also produces waste. To counter this problem, the textile industry has taken many measures to reduce its negative contribution to the environment. One such measure is textile recycling, which involves the reuse and reproduction of fibers from textile waste.

WHY BOTHER? WHY TEXTILE RECYCLING!

It is estimated that more than 1 million tons of textiles are discarded every year, with most of them coming from household sources. Over 70% of the world's population uses second-hand clothes (Textiles online). Textiles comprise approximately 3% of the weight of a household bin. Because textiles are nearly 100% recyclable, nothing in the textile and apparel industry should be wasted in the future. At least 50% of the textiles we throw away are recyclable.

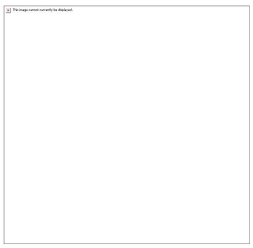
Although the majority of textile waste originates from household sources, waste textiles also arise during yarn and fabric manufacture, garment-making processes, and from the retail industry. These are termed post-industrial waste, as opposed to post-consumer waste, which goes to jumble sales and charity shops. Together, they provide vast potential for recovery and recycling.

In times of textile raw material scarcity, the recycling of end-of-life textiles becomes a necessity, and craftsmen or even the recycling industry try to achieve higher output this way. Textile waste is considered a valuable source of raw materials. There are many compelling reasons for recycling waste from textile products and processes. However, the rate of textile recycling is not very high. In addition to the often attributed reason of insufficient public willingness to participate in recycling, economics is often the reason behind the adoption of other modes of waste disposal.

NEED OF TEXTILE RECYCLING

Textile recycling provides both environmental and economic benefits. It avoids many polluting and energy-intensive processes used to make textiles from fresh materials. Clearly, recycling is not always the preferred approach, considering environmental impact and product competitiveness; however, preference is always relative and changing. The key is the availability of cleaner, more energy-efficient, and less expensive technologies. Developing better technologies requires talent, resources, and time. Several promising technologies and ideas for recycling systems are available. Recovery and recycling provide both environmental and economic benefits to society. Textile recovery:

- Reduce the need for landfill space. Textiles present particular problems in landfills as synthetic (man-made fibers) products will not decompose, while woollen garments do decompose and produce methane, which contributes to global warming.
- Reduces pressure on virgin resources:
- Aids the balance of payments as fewer materials are imported. This results in less pollution and energy savings, as fibers do not have to be transported from abroad.



3R Concepts

Waste Disposal Hierarchy

- **Reduce**
- **Reuse**
- **Recycle**

Reclaiming fibre avoids many of the polluting and energy intensive processes needed to make textiles from virgin materials, including: -

- Savings on energy consumption during processing, as items do not need to be re-dyed or scoured.
- Less effluent, unlike raw wool, which does not have to be thoroughly washed using large volumes of water.
- Reduction of the demand for dyes and fixing agents and the problems caused by their use and manufacture.

TEXTILE RECYCLING

Textile recycling is the method of reusing or reprocessing used clothing, fibrous materials, and clothing scraps from the manufacturing process. Textiles in municipal solid waste are mainly found in discarded clothing, although other sources include furniture, carpets, tires, footwear, and nondurable goods such as sheets and towels. Textile recycling originated in Yorkshire Dales approximately 200 years ago. These days, the 'rag and bone' men are textile reclamation businesses, which collect textiles for reuse (often abroad), and send material to the 'wiping' and 'flocking' industry and fibers to be reclaimed to make new garments. Textiles made from both natural and man-made fibers can be recycled.

Mechanical recycling, chemical recycling, upcycling and reuse are the textile recycling methods which significantly reduces the landfill waste and demand of new resources. Mechanical recycling involves the physical tearing or shredding the old textile material into short fibers which further used for mainly insulation, mattress stuffing and cleaning rags. Whereas, chemical recycling breakdowns the material at molecular level to create new high quality fibers. Upcycling and reuse are best methods for recycling over mechanical or chemical recycling

Clothes in today's marketplace are different from those of several decades ago, not only in design but also in fiber content. After synthetic fibers entered the market in the 20th century, textile recycling became more complex for two distinct reasons: (1) fiber strength increased,

making it more difficult to shred or ‘open’ the fibers, and (2) fiber blends made it more difficult to purify the sorting process. Nonetheless, the recycling industry must cope with everything generated by the fashion industry.

TYPES OF TEXTILE WASTE

Textile and apparel recycling efforts are concerned with recycling, recyclability, and source reduction of both pre-consumer and post-consumer waste. Textile recycling materials can be classified as either pre-consumer or post-consumer waste; textile recycling removes this waste from the waste stream and recycles it back into the market (both industrial and end-consumer). Pre-consumer waste consists of by-product materials from the textile, fiber, and cotton industries that are remanufactured for the automotive, aeronautic, home building, furniture, mattress, coarse yarn, home furnishing, paper, apparel, and other industries. Post-consumer waste is defined as any type of garment or household article made from manufactured textiles that the owner no longer needs and decides to discard. These articles are discarded because they are worn out, damaged, outgrown, or have gone out of fashion. For centuries, fiber has been reclaimed from end-of-life textiles and made into textile products, which has become a well-proven and effective recycling method.

SOURCES OF TEXTILE WASTE

The majority of textile waste comes from household sources. Average lifetime of any clothing is deemed to be for about 3 years, after which, they are thrown away as old clothes. Sometimes even 'not so worn garments' are discarded as they become unfashionable or undesirable. These are post-consumer wastes that go to jumble sales and charitable organizations. Most recovered household textiles coming to these organizations are sold or donated. The remaining ones go to either a textile recovery facility or a landfill. Textile waste also arises during yarn and fabric manufacturing, apparel-making processes, and the retail

industry. These are post-industrial wastes. Apart from these textile wastes, other wastes such as PET bottles are also used for recycling polyester fiber.

“WEALTH OUT OF WASTE”

Each fabric is suitable for recycling by many ways; even old and worn fabrics may have areas that are still in good condition, and pieces can be cut out and used as patches, appliqué, or to make small accessories and decorative items. Some innovative work and attempts needed to recycle fabric waste into useful as well as decorative items such as bags, wall pieces, cushions, pouches, belts, table mats/runners, soft toys etc. Such approach has the potential to generate economic gains with lower investment, best solution of recycling and homemakers or rural women can be empowered by “wealth out of waste.” Consumers are now also aware to the recycling of clothing as it helps in conserving resources, reducing landfills, minimizes pollution, support the circular economy which will offer a great platform for the export market.