Human Nature Journal of Social Sciences
Vol.6, No.3 (September, 2025), Pp.208-221
ISSN(online): 2788-5240, ISSN(print): 2788-5232
DOI: https://doi.org/10.71016/hnjss/4c902006

Original Article **https://hnpublisher.com**

Exploring Recycling Methods for Fabric Waste in Textile Consumer Goods Manufacturing

Rabia Shoukat[1], Asna Mubashra[2], Sobia Asim[3]

[1]Lecturer, Department of Textile Design, Lahore College for Women University, Lahore, Pakistan.
[2]Chairperson, Department of Textile Design, University of the Punjab, Lahore, Pakistan.
[3]Research Scholar, Department of Textile Design, University of the Punjab, Lahore, Pakistan.
Correspondence: asna.cad@pu.edu.pk[2]

ABSTRACT

Aim of the Study: The study looks at the reasons behind fabric waste, the effects it has on the environment and the economy, and the contribution of innovation, technology, and sustainable practices. Pre- and post-consumer textile waste is separated into two groups; the apparel industry produces a large amount of both due to inefficient production practices and rapid fashion fads. The research paper underlines how important it is for the clothing sector to embrace a circular economy paradigm.

Methodology: The research technique includes conducting investigations on textile waste collected from the QUAID-E-AZAM Industrial Area in Lahore. Quantitative data is used to design innovative recycling procedures for recovering wasted industrial textiles. Processes for recycling that use mechanical, chemical, and thermal energy are examined, with a focus on upcycling to produce goods that are comparable to or more valuable.

Findings: Findings shows that effective management of textile waste necessitates the use of waste prevention techniques together with the 3R approach (reduce, reuse, and recycle). The findings include a diverse spectrum of abandoned student-made products, including jewelry, accessories, and home décor.

Conclusion: The paper finishes with a discussion of research aims and obstacles, with a particular emphasis on encouraging ecologically appropriate textile waste disposal techniques.

Keywords: Fabric Waste, Textile Consumer Manufacturing, Sustainability, Environmental Impact, Waste Projects.

Article History

Received:
August 01, 2025

Revised:
September 22, 2025

Accepted:
September 25, 2025

Online:
September 30, 2025

1. INTRODUCTION

The term "fabric waste" describes the wasted or abandoned fabric produced during the manufacture and usage of textiles. It's a serious environmental issue that has sparked initiatives to recycle, reuse, and reduce cloth to lessen its negative effects on ecosystems and landfills. Fabric waste is excess or discarded textile material created throughout different stages of the production and use of textiles. The ramifications of this environmental issue for sustainability and resource management have garnered a lot of attention. According to the Ellen MacArthur Foundation, fabric waste is a major issue in the fashion industry, with

around 92 million tonnes of textile waste produced globally each year ("A New Textiles Economy: Redesigning Fashion's Future," 2017). Waste such as offcuts, unsold items, and abandoned clothing add to environmental degradation and resource depletion. To reduce the environmental effect of textile waste, efforts to address it include adopting circular economy ideas, supporting sustainable industrial practices, and encouraging responsible consumer behavior (Ellen MacArthur Foundation, 2021). Scraps, cuts, and end-of-life clothing are examples of materials that are thrown away or left unused in the textile business and are referred to as textile fabric waste. This waste may be from unsold goods, consumer disposal, or production operations. Fabric waste is defined as abandoned or useless fabric created during textile manufacture and consumption. This trash can be generated at several phases, including manufacture, cutting, and consumer usage. Here are some important facts concerning fabric waste:

Production Waste: Excess fabric may be produced during the textile manufacturing process as a result of mistakes made during production, defective parts, or inefficiencies in the workflow.

Cutting Waste: while cutting designs from big rolls of fabric, there may be material left over or unused while making clothes. This is frequently the result of pattern placement optimization to reduce waste.

Consumer Waste: When customers dispose of their old or unwanted apparel after making a purchase, they may add to the fabric waste. Fast fashion trends may make this problem worse by encouraging more frequent item discarding.

Impact on the Environment: Fabric waste has a big impact on the environment. It adds to landfills, where synthetic materials cannot break down quickly creating long-term environmental issues.

Recycling Initiatives: A few programs concentrate on recycling waste fabric. Reusing or repurposing old textiles to make new items is known as textile recycling, and it helps to lessen the total impact on the environment.

Up-cycling: Up-cycling is an additional strategy to reduce fabric waste in which used fabrics are repurposed into new, more valuable goods rather than being thrown away.

Circular Economy: By making things long-lasting, easily repairable, and recyclable, circular economies seek to reduce waste. This method may be used with textiles to lessen the negative effects of fabric waste on the environment.

Industry Practices: Using eco-friendly materials and increasing manufacturing efficiency are two examples of how the textile industry is adopting waste-reduction strategies as a result of ethical and sustainable fashion initiatives.

Raising customer awareness: Consumers must become more conscious of how fabric waste affects the environment. Reducing total fabric waste may be achieved by educating people about sustainable fashion options and appropriate disposal.

Government rules: To reduce textile waste, certain areas have begun to enact rules. Guidelines for recycling, waste minimization, and responsible manufacturing may be included in these rules.

Fabric waste is defined by the Ellen MacArthur Foundation as excess or wasted material from the creation of textiles and clothing, including pre- and post-consumer waste from manufacturing processes and worn textiles. Kate Fletcher, an expert in sustainable fashion sees fabric waste as a byproduct of the linear fashion system and emphasizes the importance of moving towards regenerative and circular methods to reduce the environmental effects. The United Nations Environment Program (UNEP) emphasizes the significance of sustainable production and consumption in the textile sector and characterizes fabric waste as a major environmental concern that contributes to pollution and resource depletion. The Waste and Resources Action Program (WRAP) emphasizes the importance of reducing, reusing, and recycling textiles to minimize waste by defining fabric waste as any textile material that is abandoned by consumers or at any point in the supply chain. Fabric waste is viewed as a symptom of rapid fashion and pushes for openness and responsibility in the fashion industry to address the social and environmental implications

of textile manufacturing. Fabric waste is a major problem in the textile industry, causing both environmental and economic implications. During the creation of consumer products, the fashion sector, in particular, creates a significant amount of fabric waste.

1.1 Fabric Waste Reasons

Reducing inefficiencies: Fabric waste is caused by irregular pattern layouts, poor cutting processes, and imprecise measurements.

Off-cuts and remnants: Small scraps of cloths that are frequently discarded.

Fabric flaws or defects: Fabric rolls might have flaws or blemishes that result in waste.

Environmental Impact: Because of waste production, water use, and chemical emissions, the textile industry is one of the main sources of pollution in the environment. The issue of textile waste is becoming worse as a result of the frequent disposal of fabric waste in landfills.

Economic Implications: Manufacturers suffer a financial loss as a result of wasteful production. Profitability can rise and expenses can be decreased by reducing fabric waste.

Sustainable Practices: The fashion industry is witnessing a growing prominence of sustainable fashion and responsible production. Reducing fabric waste may be achieved by using eco-friendly materials and production techniques.

Technology and Innovation: Fabric utilization may be optimized via cutting-edge automation and cutting technologies. Better pattern-making and waste reduction may be achieved with the use of digital prototyping and 3D modeling (Saceviciene, 2017).

The garment sector has grown to be the fastest-growing user of fiber during the past ten years. Due to intense market rivalry and a lack of time for thoughtful planning and design, only 60% of the clothing made by garment firms is successful in finding a buyer, with 40% of products going unsold or never making it into stores. Massive amounts of textile waste are produced by the take-make-waste linear economic model that is now applied in the garment sector and excessive clothes consumption (Larney, 2011). Textile waste is classified into two types: pre-consumer waste and post-customer waste. Post-consumer trash is generated by garment consumers and consists of worn, torn, and rejected garments. Pre-consumer trash, also known as post-industrial waste, is derived from residual raw materials created during the textile and garment manufacturing processes. Fibers, yarns, off-cuts, selvages, roll ends, and rejected materials are examples. The majority of textile waste in the garment manufacturing process is created by cutting garment components from 2D flat plain or patterned fabrics to make 3D-ready items. Various study findings claim that 15–25% of the overall amount of textile materials consumed is wasted. This indicates that just 80% of the premium textile materials that businesses in the sector buy are put to use for their intended application. The remaining 20% is recycled, burned, landfilled, or used again (Bukhari, 2018). It has also been shown that mixed and synthetic fibers make up the majority of textile waste. They ought to be recycled because they are not biodegradable and don't break down in landfills. Waste that doesn't biodegrade might be turned into insulating goods for the building sector. However, the tools and technology needed to accomplish so effectively are lacking. A very small portion of post-industrial waste is utilized to make other products, such as reinforcing structures made of various composite materials. Eighty percent of textile waste ends up in landfills or is burned, squandering energy and raw materials and causing major environmental issues (Juciene, 2017). The garment sector has to start using the take-make-waste circular economy model to discover innovative and sophisticated work techniques for all three of its phases—product designing and production, waste collecting, sorting, and recycling—to reduce or at least minimize pre-consumer textile waste. The garment creation process needs the most immediate and significant reorganization since changes made here have the most potential to reduce the amount of textile waste produced and to enhance trash collection, sorting, and recycling (Zafirova, 2015).

Production Waste: Waste is everything that people decide they no longer need and choose to get rid of (Nielsen and Schmidt 2014). Fibers, yarns, fabric scraps, and garment cuts produced by textile mills, fabric manufacturers, and clothing makers make up production waste (Domina and Koch 1997). Depending on the production processes followed in the location where the trash is created, the forms of waste might differ (Wang 2010). Fabric cutoffs and roll ends are a major source of waste, particularly in the manufacturing industry (Gardetti and Torres 2013). Fabric flaws that arise during production also lead to production waste, which is extremely expensive for businesses. It is a known fact that in the majority of organizations, the overall cost of defects represents a sizable portion of the entire cost of production.

Pre-consumption Waste: Pre-consumer waste is defined as items that are made with design flaws, fabric flaws, or inappropriate colors for sale and consumption (Ekström 2014). In other words, pre-consumer waste in the retail sector comprises unsold and damaged items (Gardetti and Torres 2013). Because it can be sold to an outlet, jobber, or consolidator, pre-consumer trash is not entirely useful to the store.

Post-Consumer Waste: Post-consumer waste includes any form of clothing or home item manufactured from fabricated textiles that the owner no longer requires and chooses to discard. Consumers may reject these items when they get worn, damaged, outgrown, or out of style. The volume of post-consumer waste is enormous, similar to the rate of fiber consumption (Wang 2010). In comparison to other waste kinds, the volume of post-consumer waste is quite considerable (Wang 2010). The volume of post-consumer textile waste disposed of in landfills in the United States is projected to be 10.5 million tonnes per year, 350,000 tonnes per year in the United Kingdom, and 287,000 tonnes per year in Turkey (Karaosman et al. 2017).

Textile Waste Management: Municipal solid waste management has reached a tipping point due to a lack of sufficient facilities to process and dispose of massive volumes of trash generated in metropolitan centers (Sharholy et al. 2008). Most countries are attempting to reduce the quantity of waste disposed of in landfills while increasing the amount of recycling. For example, the European Union (EU) has mandated that member nations reuse or recycle 50% of urban garbage by 2020 (Fortuna and Diyamandoglu 2017). Prevention is the first stage in the waste hierarchy followed by reuse, recycling, waste energy generation, and landfilling. The circular economy seeks to minimize resource consumption and environmental effects by promoting recycling and extending the life of products to maximize material service per resource input (Tisserant et al. 2017). In addition, the circular economy encourages product recovery within the same supply chain and collection of goods (Fortuna and Diyamandoglu 2017). One of the core ideas of the circular economy for a sustainable society is the 3R (reduce, reuse, and recycle) approach to trash management, which has gained recognition on a global scale (Yano and Sakai 2016; Tisserant et al. 2017). Prominent fashion stores that are cognizant of the circular economy include H&M, Levi Strauss & Co., and Marks & Spencer (H&M Group 2016; Levi Strauss & Co. 2015; Marks & Spencer 2016).

Recycling: Since US charities and the textile industry began reusing clothing, shoes, and accessories in the mid-1940s, the phrase "textile recycling" has gained prominence (Nodoushani et al. 2016). Every use of textiles in daily life falls within the general concept of recycling. But this category can also be divided into "down-cycling" and "up-cycling" subcategories based on the caliber of the finished product. The end product that is recycled throughout the recycling process has the same quality as the base or original product. Waste material is recycled into a raw material with a lesser value than the original material in a process known as down-cycling. By reducing the consumption of new raw materials and air, down-cycling may prevent the waste of valuable resources and reduce contamination of water. A waste material is recovered by a process called up-cycling, which turns it into a raw material that is more valuable than it was initially (Vats 2015). To put it another way, up-cycling is the process of creating a new product out of trash that is either as good as or better than the original. Up-cycling goods is a concept that Michael Braungart and William McDonough first proposed. Unlike recycling, they propose a procedure where the result has a value that is at least equivalent to the original product (Gardetti and Torres 2013). Up-cycling can include transforming an old curtain into new clothing or an old pair of trousers into a new purse

(Ekström 2014). Recycling post-consumer textile waste involves several laborious procedures such as sorting, separation, and processing (Strähle and Philipsen 2017). Textile waste may be recycled in 97% of cases (Briga-Sá et al. 2013). However, the textile recovery rate is just 15% (Wang 2006). Mechanical recycling, chemical recycling, thermal recycling, and a combination of these technologies are the four types of textile recycling. Mechanical recycling is the most often utilized approach and may be used to recycle a wide variety of textile waste compositions (Zonatti et al. 2016). The process of mechanical recycling involves breaking down textile materials into tiny fragments (Oliveux et al. 2015). By tearing the fabric apart, traditional mechanical recycling converts discarded clothing into yarns and fibers, which are then either processed into recycled yarn for textile uses or processed for other purposes (Haule et al. 2016).

Reduction (Prevention): According to Nielsen and Schmidt (2014), waste prevention is the process of being aware of the negative impacts that trash generation has on the environment and on humans as well as the significance of waste reduction and product reuse. The European Parliament and Council's (2008) Directive 2008/98/EC provides the following description of preventive (reduction): "Prevention refers to actions taken before a substance, material, or product turns into waste that lessen: (a) the amount of waste produced, such as by reusing items or extending their lifespan; (b) the negative effects of the waste generated on the environment and human health; or (c) the number of hazardous substances present in materials and products."

Textile Waste: Materials that are wasted or thrown in the textile industry are referred to as textile waste. Textiles from homes and worn-out clothes are examples of end-of-life products. Manufacturing waste comprises trimmings and residues from production operations. Textile waste can be produced in several phases, from the extraction of raw materials to the disposal of the finished product. Because of its influence on landfills and the potential for contamination, textile waste poses environmental issues.

Making Use of Textile Waste: Nowadays, sustainability is a need rather than an option (Dissanayake et al. 2017). Reducing output is not a practical way to control waste since the market must continue to operate; nevertheless, it is possible to minimize waste and save natural resources by inventing new techniques. As such, designers are now responsible for repurposing industrial waste to create new goods (Costa et al. 2017). The scholarly studies and innovative designer works are discussed in the ensuing parts to highlight fresh viewpoints and approaches to the problem of textile waste.

2. LITERATURE REVIEW

The textile and clothing industries are not new to recycling and material reuse. Payne makes the following distinctions between reuse and recycling: Recycling is the process of disassembling a product into its parts so that those parts can be recovered and utilized to create new items. Reuse, on the other hand, describes the repurposing of an existing product along the same manufacturing chain. Reclaiming pre- or post-consumer waste can be a part of textile recycling (Payne 2015, p. 105). When end goods approached the end of their useful life in one product, they were reused for millennia. There are several ways that reuse takes place. It is possible to deconstruct an old product and rebuild it into a new—possibly distinct—product. Pop culture is full of examples of repurposing, such as the moment in Gone with the Wind where Mamie takes down the green velvet curtains and uses them to make a gown for Scarlett O'Hara (Mitchell 1936). In the past, it was typical for clothing to be altered to suit a different person or changed to produce a more fashionable item when it was no longer needed, outgrew, or in style. Wool recycling dates back hundreds of years. Clothing, like as wool sweaters, was gathered, torn into individual fibers, and then made into blankets once it had become completely worn out. Clothing articles are frequently donated to organizations for resale or dumped in the garbage once they have served their purpose. Items that are no longer valuable as their original product are sometimes repurposed into rags or stuffing. Hawley (2015) gives a detailed examination of the many methods by which discarded clothing is repurposed. Recycling is disassembling a product to reveal its constituent basic ingredients. For millennia, textile goods, including clothing and textiles, were processed to make yarn, which was then

used to create various knitted or woven materials. Occasionally, the yarns undergo more breakdown until they reach the fiber stage, at which point the fibers are spun again into yarns for usage in newly created textile goods. This was rather typical before the middle of the 20th century. The Wool Products Labelling Act, which was first introduced by the US Federal Trade Commission in 1939, mandates that wool products be accurately labeled to distinguish between fibers that have never been recovered from woven or felted wool products, which are identified as "wool," and "recycled wool," which refers to fiber that has been spun, woven, knitted, or felted into a wool product before (Federal Trade Commission 2016). Examples of historical traditional textile practices from different cultures, where fabric scraps were frequently utilized to create patchwork designs and recycle old garments. Boro: In rural Japan, Boro was the practice of patching together worn-out or torn fabrics to create beautiful and intricate patchwork designs. Boro textiles were frequently created from indigo-dyed cotton and were used for a variety of purposes ranging from apparel to sleeping.

Figure 1 *Japanese Patchwork, Sashiko Jacket.*

Figure 2 *Sustainable Quilting using up-cycled fabric waste.*

Figure 3 *Rag Rug made from waste fabric scraps.*

Figure 4 *Crazy Quilts with intricate needlework*

Quilts in the United States include: Quilting was a popular hobby among early American immigrants. They would up-cycle unwanted clothes and fabric scraps into warm and practical quilts. Quilts with elaborate patchwork designs were frequently passed down through generations.

Scandinavian Rag Rugs: Rag rugs have a long history in the Nordic nations. These carpets were created by braiding or weaving leftover fabric and shreds of discarded garments together. They were commonly employed as floor coverings in dwellings and served as both ornamental and practical floor coverings.

Crazy Quilts in the United States: In the United States, crazy quilts gained popularity in the late 1800s. They were typically adorned with intricate needlework and constructed from asymmetrically formed cloth pieces. Crazy quilts were a technique to use leftover pieces of velvet, satin, and silk into opulent and artistic bed covers.

2.1 Research Objectives

- To investigate eco-friendly strategies for cutting the textile industry's waste of fabric.
- To investigate and assess various waste cloth recycling techniques.
- To develop innovative recycling methods.
- Using leftover industrial textile fabric to create new textile products.
- Industrial textile waste recycling methods help cut down on the quantity of garbage that contaminates the environment.
- To promote the environmentally friendly handling of textile waste.

2.2 Research Questions

- How can waste fabric be efficiently managed and repurposed via the use of creative recycling techniques?
- How can support the textile industry's adoption of sustainable practices?
- How can the efficiency of the present techniques for recycling fabric waste be improved in the production of textile consumer goods?
- What advantages does the textile sector stand to gain by implementing fabric waste recycling?

3. RESEARCH METHODOLOGY

This section outlines the materials and procedures employed in the current research project. True experimental research was used in the study. In this study, the fabric waste material is collected from QUAID-E-AZAM Industrial Area (KOT LAKHPOT) Lahore. This study explores sustainable solutions for fabric waste in textile industries.

Figure 5 *Industrial fabric waste.*

This research is based on quantitative data. This is an experimental study. Fabric waste is recycled to create new products. Fabric waste from the textile industry is collected. These scraps of cloth are recycled to make consumer products and artwork. The waste material is distributed to textile design students at Lahore College for Women University and College of Art and Design (University of Punjab) to create aesthetically pleasing and useful products.

4. FINDINGS

The experimental study of fabric waste recycling for new product development. This investigation turned up a variety of repurposed goods made by university students. The recycled items discovered during this investigation include jewelry, fans, scrunchies, table mats, glass cases, skirts, pillow covers, handbags, corsets, wall hangings, placemats, plant pots, pouch bags, shoes, hair bands, bracelets, and key chains. Each product is described individually.

Corset: The waste fabric has been used to make this product. Patchwork is used on the front of the corset, while fabric strip weaving is used on the back. A patchwork corset made from leftover fabric collects different fabric remnants. Once they are cut into consistent shapes, stitch the pieces together to create a visually appealing arrangement.

Figure 1 *Corset.*

Figure 2 *Place Mat.*

Figure 3 *Fashion Arm sleeves.*

Placemat: This product has been created with different fabric strips. Collect the leftover fabric strips in a variety of colors and textures. Cut the fabric to the size of the mat, then place the fabric strips in a circular pattern, finishing with a little simple circle fabric in the center of the mat.

Arm Band: Organza and net waste fabric were used to make this product. To get the appropriate length, cut the net cloth. After stitching it into a circle, add some floral organza fabric as a decorative accent to the wrist point.

Wall Hanging: Fabric and lace scraps were used to make this artwork. The main emphasis of this product is the doll. The frock of the doll is made with organza fabric and embellished with golden lace. The outline of the wall hanging was created with fabric braiding with light and dark purple colors.

Figure 4 *Wall hanging.*

Figure 5 *Printed Fabric Wrist Bands.*

Wristbands: This product has been created with leftover waste of printed organza fabric. Stitch the fabric pieces according to wrist measurement and stretch the thread to add pleats in the band.

Pouch: Waste fabric from printed organza was used to make this product. Sew the pieces together, leaving an opening, after cutting the cloth to the appropriate size and form. Turn the bag inside out, sew on a cloth strip, and add a pleated closure.

Figure 6 *Fabric Pouch Bag.*

Figure 7 *Fashion Accessories.*

Figure 8 *Fabric Plant Pot.*

Accessories: These items were made from leftover printed organza fabric. The hairband was adorned with beads. The earrings were made from the pleated cloth.

Plant Pot: Recycled textiles were used to make this item. To build a pot, the twisted cloth is wrapped around the bottle. The fabric of various colors was utilized to create an aesthetically pleasant effect.

Shoes: Organza fabric was used to make this pair of shoes. Pleated pink organza fabric was used to make the shoe strap, while fabric braiding was used to create the shoes' shape. For an eye-catching effect, top the pleated cloth with a braid of fabric.

Handbag: This product was made using leftover cloth. A bag was made from the patchwork. Collect various remnants of fabric, cut them into squares or rectangles, then stitch them together to create a visually pleasing patchwork design. The fabric strips were used to hold the bag.

Figure 9 *Fabric Shoes.*

Figure 13 *Fabric Handbag.*

Polti Bag: This elegant handbag was made from fabric scraps. Fold the cloth in half after cutting it into a rectangular shape. Sew the sides together but leave the top open. Decorate the bag with a mirror embellishment and close it with a beaded string. Two distinct colors and textures were utilized to create a unique and stunning effect.

Tablemat: This art piece has been created with fabric waste. Different colors and textured fabric were used to make a table mat. The fabrics are cut into square pieces and then sewed together to make a square piece. To make the textiles seem more visually attractive, add diagonal stitching on top of them.

Hand Fans: Organza cloth with a flowery design was used to make this product. The folding fans were made using the ice cream sticks. Together, affix the ice cream sticks. Wrap the cloth around the sticks.

Figure 10 *Fancy hand Potli Bag.*

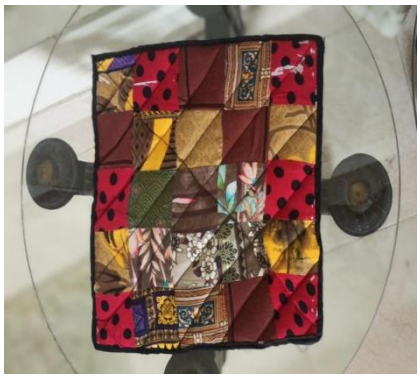

Figure 11 *Fabric Table Mat.*

Figure 12 *Fabric Folding Fans.*

Glasses Case: Khaddar and organza scraps were used to construct this product. Sew three sides of the cloth together, turn it inside out, and then stitch the open end after cutting the fabric into two similar rectangles.

Figure 14 *Fabric Glasses Case.*

Figure 15 *Scrunchies.*

Hair Tie: This item was made using leftover cloth. Cut a lengthwise piece of cloth, stitch the edges, turn it inside out, insert an elastic band, and sew the ends together. Use beads to embellish.

Skirt: Waste cloth was used in the creation of this product. Gather diverse fabric fragments with a range of hues and designs. Make squares or rectangles out of them. Create a patchwork fabric by piecing the fabric pieces together in an aesthetically pleasing design and sewing them together. With this patchwork

fabric, create a skirt pattern by sewing the pieces together according to the layout of the skirt. Include an elastic waistband for the closing.

Jewelry: This art piece was made from scrap cloth. The twisted textured fabric was used to create a necklace, which was then embellished with beads. Earrings were made using a stud piece with a cloth cover.

Figure 16 *Patchwork Skirt From Fabric Scraps.*

Figure 17 *Fabric Jewelry.*

Headbands: The leftover fabric from printed organza was used to make this artwork. Cut a piece of cloth, twist the ends in slightly, and insert the elastic. To make the length more comfortable, adjust it.

Clutch: Fabric waste was used to make this product. Cut a tiny square for the flap and two similar squares for the front and back. Attach the flap after sewing the zip to the upper edges of the front and back sections. Sew the bottom and sides together, leaving a tiny hole for turning it right side out. Closing the gap with a stitch.

Pillow Covers: Waste cloth was used to make this product. Cut the two similar pieces of fabric, stuff the cushion in, turn it inside out, and sew the three sides together. Close the open side with a stitch.

Figure 18 *Fabric Elastic Hair Bands.*

Figure 19 *Fabric Clutch.*

Figure 20 *Pillow Covers.*

Pouch: Recycled cloth was used to make this item. The cloth is cut into a rectangle, folded in half, and the edges are sewn together. Tie a ribbon over it to seal it.

Handbag: This product has been created with fabric scrap of organza. Cut the different fabrics into a circle shape. The circle-shaped fabric is attached to the bag. To enhance the beauty of the bag.

Wall Hanging: Remaining materials from leather, screen printing, and weaving were used to create this artwork.

Figure 21 *Makeup Pouch.*

Figure 22 *Hand Bag.*

Figure 23 *Fabric Wall Hanging*

Choker: The remaining cloth was used to make this product. Trim a piece of cloth to the appropriate width and length. Use thread strings to enhance the design.

Fabric Jewelry: The fabric waste was used to make these items. The cloth used to make these products was printed. The cuff bracelet sews fabric strips together after cutting them to the correct length and width.

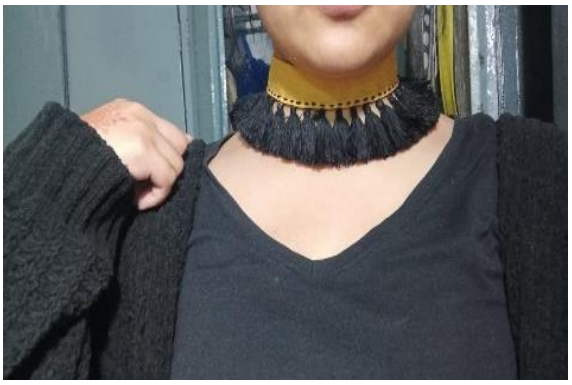

Figure 23 *Fabric Choker*.

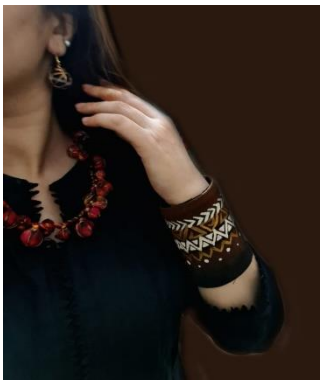

Figure 24 *Accessories.*

Pillow Cover: This product was made using scrap cloth. Collect a variety of fabric scraps, cut them into squares, and stitch them together in a beautiful pattern. Sew the patchwork panel to a wide piece of fabric for the pillow cover, then add a back panel and sew it all together.

Necklace: Organza fabric was used to make this artwork. Cut lengthy cloth strips with a variety of hues and designs. Twist two or more strips together, then use the twisted cloth to create a circle. Use sewing or glue to secure the ends. As an accent, add a little bead string.

Key Chains: Organza fabric was used to make this item. Trim a small piece of cloth, fold it in half, and stitch along the edges, leaving a tiny gap. After turning it inside out and packing some stuff inside, stitch the opening closed. Place a key ring atop it.

Figure 25 *Pillow Cover.*

Figure 26 *Necklace.*

Figure 27 *Fabric Keychain.*

Every product is made from recycled fabric waste to create useful and beautiful items.

5. CONCLUSION

Finally, research into sustainable strategies for recycling waste fabric to generate textile consumer products has revealed major environmental concerns about wasted fabric. The clothing industry, in particular, contributes greatly to resource depletion and environmental damage since it produces so much waste fabric. The identification of various types of fabric waste, such as cutting waste, manufacturing waste, and consumer waste, presents a substantial challenge to environmental sustainability. The environmental consequences of fabric waste, which include chemical emissions and landfills as well as water usage and consumption, highlight the need for a solution. Several techniques and programs have been researched to reduce the environmental and economic impact of fabric waste. Circular economy concepts, recycling programs, upcycling, and sustainable manufacturing practices are among the most common ways. Furthermore, industry practices, technology and innovation, customer awareness, and government regulations all play an important role in reducing fabric waste. The literature review examines historical reuse and recycling strategies in the textile industry, highlighting examples such as Boro in Japan, quilting in the United States, and rag carpets in Scandinavia. These historical traditions serve as a paradigm for present efforts to recycle textile waste. The study's aims and concerns provide a framework for investigating ecologically beneficial strategies, assessing recycling systems, developing new ways, and supporting responsible textile waste management. The study's methodology, which focuses on long-term solutions for fabric waste in the textile sector, uses real experimental research. The results of the experimental investigation show that waste cloth may be recycled into a range of aesthetically pleasing and practical items. The inventive repurposing of leftover fabric, from wall hangings and jewelry to corsets and tablecloths, showcases the potential of sustainable design. This study offers crucial new information on how to reduce fabric waste in the textile industry in an environmentally responsible manner. The repurposed items on exhibit show that recovering fabric waste is feasible and that using sustainable practices is essential to reducing the environmental effect of the textile industry. Future textile businesses will require constant efforts at innovation, research, and awareness-raising to become more morally and environmentally conscious.

Acknowledgements

None.

Conflict of Interest

Authors declared NO conflict of interest.

Funding Source

The authors received NO funding to conduct this study.

ORCID iDs

Rabia Shoukat [1] https://orcid.org/0009-0006-6362-9377
Asna Mubashra [2] https://orcid.org/0000-0003-0743-6846
Sobia Asim [3] https://orcid.org/0009-0007-3851-3337

REFERENCES

Bukhari MA, Carrasco-Gallego R, Ponce-Cueto E. (2018). Developing a National Program for Textiles and Clothing Recovery. *Waste Management & Research*, *36*(4), 321-331. https://doi.org/10.1177/0734242X18759190

Dobilaite V, Mileriene G, Juciene M, Saceviciene V. (2017). Investigation of Current State of Pre-Consumer Textile Waste Generated at Lithuanian Enterprises. *International Journal of Clothing Science and Technology*, *29*(4), 491-503. https://doi.org/10.1108/IJCST-08-2016-0097

Gupta C, Vaid N, Jain A. (2016). Recycling Pre-Consumer Textile Waste Using Water Soluble Film Technology for Promoting Environmental Sustainability. *International Journal of Science and Research* *5*(11), 1001-1006.

Jordeva S, Tomovska E, Trajković D, Zafirova K. (2015). *Current State of Pre-Consumer Apparel Waste Management in Macedonia. FIBRES & TEXTILES in Eastern Europe, 23*(109), 13-16.

Koszewska M. (2018). Circular Economy – Challenges for the Textile and Clothing Industry. *AUTEX Research Journal*, *18*(4), 333-347. https://doi.org/10.1515/aut-2018-0023

Larney, M., Aardt A.M. (2010). Case Study: Apparel Industry Waste Management: A Focus on Recycling in South Africa. *Waste Management & Research*, *28*(1), 36- 43. https://doi.org/10.1177/0734242X09338729

Scheirs, J. (1998). *Polymer Recycling, Science, Technology and Applications*. Wiley, New York.

Yuk-lan L. (2015). Reusing Pre-Consumer Textile Waste. *Springer Plus*, *4*(2), 9. https://doi.org/10.1186/2193-1801-4-S2-O9