



TEXTILE REUSE AND RECYCLE: A STEP TOWARDS CIRCULAR ECONOMY

Dr Suniti Sood

Associate Professor

Amity School of Fashion Design & Technology

Amity University Haryana, India

Abstract: The textile industry is one of the largest contributors to global environmental degeneration, with high consumption of resources, water pollution, and huge amounts of waste generation. With the continuous growth of the industry, there is a grave need to transition towards more sustainable practices. The recycling and reuse of textiles have emerged as vital strategies in this transition, offering noteworthy potential to reduce waste, conserve resources, and move towards a circular economy model. The lifespan of clothing and other textile products can be extended by textile and garments reuse and finding alternative uses for them. This involves donating clothes to charity, selling or exchanging items through secondhand markets, or repurposing textiles for new uses. By giving garments, a second or even third life, textile reuse not only lessens waste but also conserves resources and decreases greenhouse gas emissions linked with garment production. Similarly, textile recycling converts textile waste into new products or raw materials, reducing pollution, preserving resources, and creating new economic prospects. These practices help reduce production of waste, decrease environmental impact, and increase resource efficiency, keeping in line with the principles of a circular economy where materials are kept in use for as long as possible. However, challenges such as scarcity of infrastructure, complexity of materials, and economic plausibility need to be addressed to realize the full potential of textile reuse and recycling. Collaborative efforts across the textile supply chain, alongside innovations in recycling technologies and sustainable fashion practices, are important for proceeding towards a circular economy in the textile industry.

Index Terms - Textile, Reuse, Recycle, Circular Economy, Sustainability

INTRODUCTION

The textile industry is one of the largest and most resource-centered sectors globally, with crucial environmental and social impacts. Right from fiber production to garment manufacturing and distribution, the textile supply chain uses huge amounts of water, energy, and chemicals while imparting substantial waste and pollution. In recent years, there has been growing awareness of the need to transition towards a more sustainable and circular textile economy. Central to this transition are the concepts of textile reuse and recycling, which offer opportunities to reduce waste, conserve resources, and minimize environmental footprint. This article explores the importance of textile reuse and recycling in advancing towards a circular economy, examining their benefits, challenges, and option for widespread adoption.

The concept of a circular economy has gained significant momentum in recent years as a sustainable alternative to the long-established linear economy. In a linear economy, resources are drawn out, processed into goods, used, and then discarded as waste, leading to resource reduction, environmental deterioration, and economic inefficiency. Circular economy aims to keep resources in use for as long as possible, through possibilities like reuse, recycling, and regeneration, hence reducing the waste and increasing resource efficiency. This article looks into the principles, benefits, challenges, and implementation strategies of a circular economy, highlighting its potential to transform resource management and encourage sustainable development.

Circular economy centers around three core principles: designing out waste and pollution, keeping products and materials in use, and regenerating natural systems. Designing out waste and pollution is about rethinking product design and manufacturing processes to reduce environmental impact throughout the lifecycle of goods. This may include renewable or recyclable materials, designing for longevity and repairability, and choosing eco-friendly production ways. Keeping products and materials in use involves increasing the lifespan of products through reuse, repair, remanufacturing, and recycling, therefore reducing the demand for virgin resources, and reducing waste production. Regenerating natural systems involves restoring and restocking ecosystems through sustainable use of land, conservation practices, and the repairing of used habitats, contributing to biodiversity conservation and climate adaptability.

The process of changing to a circular economy has many benefits economically, across environmental, economic, and social realms. From an environmental point of view, a circular economy diminishes resource extraction, minimizes waste generation, and checks pollution, thus conserving natural resources, protecting ecosystems, and mitigating change in climate. Circular economy encourages resource efficiency, inspires innovation, and creates new economic opportunities in sectors such as recycling, remanufacturing, and sustainable product design, promoting economic growth and job creation. Socially, a circular economy encourages resilience, promotes fair use of resources, and promotes community involvement and empowerment, contributing to social cohesion and well-being.

The fashion and textile industry are one of the most resource-oriented sectors world-wide, characterized by great levels of waste generation, environmental pollution, and social influence. In recent years, there has been an increasing recognition of the need to change towards a more sustainable and circular economy model within the fashion and textile industry. A circular economy perspective in this context involves reimagining the whole lifecycle of fashion and textile products, from design and production to consumption and disposal, with the aim of reducing waste, conserving resources, and increasing value retention. This article looks into the principles, challenges, opportunities, and best practices of implementing a circular economy in the fashion and textile industry, highlighting its potential to transform the industry towards a more sustainable future.

At the core of a circular economy in fashion and textiles are principles such as designing for continuance, encouraging reuse, and recycling, and applying sustainable materials and production methods. Designing for continuance involves producing garments and textiles that are durable, repairable, and timeless in style, thereby increasing their lifespan and minimizing the need for recurrent replacements. Encouraging reuse and recycling involves promoting consumers to engage in practices such as clothing rental, resale, and upcycling, and applying efficient textile recycling processes to recover materials from waste garments. Using sustainable materials and production methods involves embracing eco-friendly and renewable materials, like organic cotton, recycled polyester, and biodegradable fibers, as well as following sustainable manufacturing practices, such as water and energy conservation, and non-toxic dyeing and finishing processes.

However, the embracing of a circular economy is not without challenges. One of the main challenges is shifting from a linear mindset and overcoming entrenched behaviors and institutional barriers that focus on short-term economic gains over long-term sustainability. Also, implementing circular economy practices requires significant expenditure in infrastructure, technology, and capacity-building, particularly in regions with less resources and technical proficiency. The complicatedness of global supply chains and the variety of materials and products pose technical challenges to achieving circularity, such as material compatibility, contamination, and quality standards. Mastering these challenges requires collaboration and cooperation among beneficiaries across sectors, including governments, businesses, civil society, and academia, to develop proper policy frameworks, incentives, and innovation ecosystems.

Implementing a circular economy in the fashion and textile industry poses many challenges, like the complexity of world-wide supply chains, consumer behavior, and technical limitations in textile recycling and material recovery. Global supply chains in the fashion industry are often segmented and opaque, making it challenging to trace materials and ensure transparency and accountability throughout the process of production. Consumer behavior, characterized by fast fashion consumption and disposal habits, presents a significant obstacle to circularity, as it fosters a culture of overconsumption and disposability. Also, textile recycling technologies face technical challenges, such as fiber compatibility, contamination, and quality standards, which reduce their scalability and effectiveness.

Despite these challenges, there are various opportunities and best practices for applying a circular economy in the fashion and textile industry. Innovations in materials science and textile recycling technologies are encouraging the development of sustainable materials and closed-loop systems for textile production and consumption. Circular business models, such as clothing rental, subscription services, and product-as-a-service models, are becoming popular, offering consumers access to fashion while reducing waste and environmental impact. Collaborative initiatives and partnerships across the fashion supply chain, including

brands, manufacturers, retailers, recyclers, and policymakers, are necessary for driving desired change and increasing circular economy initiatives.

Several initiatives can encourage the transition to a circular economy. These include fostering collaboration and knowledge-sharing among stakeholders, encouraging eco-design and sustainable consumption practices, promoting research and development of circular technologies and business models, and creating enabling policy environments that incentivize circularity and internalize environmental costs. Moreover, public awareness, education, and consumer involvement are necessary for increasing demand for circular products and services and ensuring a culture of sustainability.

Importance of Textile Reuse

The reuse of textiles and clothing involves increasing the life of clothing and other textile products by finding alternative usage for them. This may include donating clothes to charity, selling or exchanging items through secondhand markets, or repurposing textiles for new uses. Textile reuse is vital for decreasing the environmental footprint of the fashion industry, as it helps to change the course of textiles from being thrown into landfills and reduce the demand for new materials. By giving clothes, a second or even third life, textile reuse conserves resource, saves energy, and reduces greenhouse gas emissions related with garment production. Moreover, textile reuse can encourage social and economic development by providing reasonable clothing options, helping local businesses, and increasing job opportunities in the textile recycling sector.

Benefits of Textile Recycling

The recycling of textiles and clothing involves the conversion of textile waste into new products or raw materials. This can be done by mechanical recycling, where textiles are shredded and processed into fibers for use in new textiles or non-textile applications, as well as can be done by chemical recycling, which breaks down textiles into their constituent components for use in manufacturing new materials. Textile recycling offers many environmental, economic, and social benefits. From an environmental point of view, textile recycling lessens the need for virgin materials, conserves water and energy, and averts textiles from landfills, thus taking care of pollution and reducing pressure on natural resources. Economically, textile recycling creates new revenue streams and job opportunities in the recycling industry while also reducing waste management costs for businesses and municipalities. Socially, textile recycling can support community development initiatives, encourage sustainable consumption practices, and solve issues of clothing affordability and accessibility.

Challenges and Barriers

In spite of the potential benefits of textile reuse and recycling, there are many challenges and barriers that hinder their widespread adoption. One of the main challenges is the lack of awareness and infrastructure for textile recycling. Many consumers are unaware of the significance of recycling textiles or how to properly discard unwanted clothing. Also, there is a lack of collection and processing infrastructure for textile recycling, especially in regions with limited recycling facilities. Another challenge is the complicatedness of textile materials and products, which can make recycling technically challenging and economically unviable. Textiles are often made from a mix of fibers and components, making it difficult to separate and recycle them efficiently. Moreover, the low value of recycled textile materials compared to virgin materials can pose economic barriers to recycling, as it may be cheaper for manufacturers to use new materials rather than recycled ones.

Innovations and Solutions

Despite these challenges, there are many innovations and solutions coming up to promote textile reuse and recycling. One approach is the development of advanced recycling technologies that can effectively process textile waste into high-quality fibers and materials. These technologies include mechanical recycling processes, such as shredding and carding, as well as chemical recycling processes, such as depolymerization and solvent-based recycling. Additionally, there is a growing interest in sustainable fashion and circular business models that give importance to durability, repairability, and recyclability. From clothing rental and subscription services to circular design principles and product stewardship enterprise, fashion brands and retailers are considering innovative ways to extend the lifespan of their products and close the loop on textile waste. Moreover, collaborations and partnerships across the textile supply chain, including manufacturers, retailers, recyclers, and policymakers, are essential for driving systemic change and scaling up textile reuse and recycling efforts.

Best Practices

Several countries and organizations have implemented successful textile reuse and recycling initiatives, giving important insights and best practices for others to follow. 'Worn Again Technologies' the Netherlands-based company, for example, has developed a chemical recycling technology that can separate and remove polyester and cotton from textile waste, helping the production of new yarns and fabrics. The fashion brand H&M has launched a garment collection program that inspires customers to donate their old clothes in exchange for store vouchers, with collected textiles being recycled into new garments or other products. Organizations like the Textile Exchange and the Ellen MacArthur Foundation are leading collaborative approaches to promote circularity in the textile industry, driving innovation, sharing knowledge, and setting industry-wide sustainability standards and goals.

CONCLUSION

Circular economy offers a irresistible vision for changing resource management and promoting sustainable development. By redesigning systems, products, and processes to remove waste, use maximum resources, and regenerate natural systems, a circular economy gives a pathway to prosperity that is in line with global boundaries and social value. Textile reuse and recycling play a vital role in moving towards a circular economy and attaining goals for sustainability in the textile industry. By increasing the lifespan of clothing and other textile products through reuse and recycling, we can minimize waste, preserve resources, and reduce impact on the environment. However, understanding the full potential of textile reuse and recycling requires intense efforts from collaborators across the textile supply chain, including consumers, manufacturers, retailers, recyclers, and policymakers. Through cooperation, remodeling, and investment in infrastructure and technology, we can create a more sustainable and circular textile economy that will benefit consumers, the planet, and bring prosperity globally.

REFERENCES

- [1] Fletcher, K., & Tham, M. (2019). *The Routledge Handbook of Sustainable Fashion*. Routledge
- [2] Ellen MacArthur Foundation. (2017). *A new textiles economy: Redesigning fashion's future*, <https://www.ellenmacarthurfoundation.org/publications/a-new-textiles-economy-redesigning-fashion-future>
- [3] Matsui, K., & Li, Y. (2020). *Textile Waste Recycling: A Methodological Study*. Springer.
- [4] Textile Exchange. (2021). About Textile Exchange, <https://textileexchange.org/about/>
- [5] Worn Again Technologies. (2021). About Us, <https://www.wornagain.co.uk/about/>
- [6] Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling*, 127, 221-232.
- [7] European Commission. (2020). *Circular Economy Action Plan*, https://ec.europa.eu/environment/circular-economy/index_en.htm
- [8] Geissdoerfer, M., Savaget, P., Bocken, N. M., & Hultink, E. J. (2017). The Circular Economy—A new sustainability paradigm? *Journal of Cleaner Production*, 143, 757-768.
- [9] Stahel, W. R. (2016). The circular economy. *Nature News*, 531(7595), 435-438.
- [10] United Nations Environment Programme. (2018). *Global Waste Management Outlook*, <https://www.unenvironment.org/resources/report/global-waste-management-outlook>
- [11] Hawken, P., Lovins, A., & Lovins, L. H. (2013). *Natural capitalism: Creating the next industrial revolution*.