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Adoption of Eco-Friendly Waste Reduction Practices in the Clothing Retail Sector in Cape Town

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ABSTRACT

The fashion and textile industry significantly contributes to environmental degradation through unsustainable manufacturing and waste disposal practices, particularly in South Africa's retail sector. This study examines the retail merchandise cycles of two prominent clothing retailers based in Cape Town, South Africa to identify stages that generate substantial fashion and textile waste and proposes a model to enhance sustainability within the industry. Adopting a qualitative, interpretive research paradigm, data were collected through purposive sampling and in-depth interviews with key personnel, primarily buyers, within the selected companies. The research involved mapping and analyzing each retail cycle phase to identify excessive waste generation points. The findings revealed that retailers produce considerable amounts of waste (pre- and post-consumer) due to fast fashion practices and insufficient recycling systems. While both companies acknowledged the importance of sustainability, there was a notable lack of concrete policies and limited visibility into supplier processes concerning environmental impact. The study identified specific departments and operations within the retail cycles responsible for significant waste production, highlighting the need for systemic changes. Based on these insights, an improved retail cycle model was developed emphasizing waste reduction through sustainable sourcing, enhanced recycling initiatives, and stricter supplier compliance measures. The proposed model aims to minimize environmental harm by integrating sustainability into all aspects of the retail process.

KEYWORDS

fast fashion, retail, sustainability, waste

INTRODUCTION

The fashion and textile industries are increasingly grappling with the sustainability challenges posed by their operations. The environmental risks associated with their manufacturing processes, including increases in pollution (air and water), resource depletion, and biodiversity loss are recognized by many leading industries [1,2]. Some of the brands have initiated various sustainability programmes to mitigate the adverse environmental impacts. However, despite these efforts, the ongoing expansion of the global fashion industry projected to grow by 3-4% annually post-COVID-19 threatens to exacerbate the industry's environmental footprint [1,3].

The negative effects of the textile and fashion industries concerning the environment are well-documented, with release of the harmful gases and toxic effluent, extensive use of water, energy and raw materials, lack of proper disposal methods for waste clothing as well as scalable technologies to process tons of discarded clothing and textile waste [4]. Furthermore, the industry's reliance on non-renewable resources such as petroleum-based fibres, chemicals, and water undermines long-term sustainability [5]. The environmental consequences of these practices are particularly severe in regions like South Africa, where local communities rely heavily on natural resources for their livelihoods [6]. The degradation of these resources not only threatens environmental sustainability but also social and economic stability, emphasizing the need for a more integrated approach to sustainability [7,8]. Strategically, sustainability in the fashion industry must go beyond mere compliance and risk management. The triple-bottom-line approach to sustainability includes environmental factors, social factors, and economic factors [7]. The triple bottom line framework provides a comprehensive set of criteria to measure progress across these three domains, aligning business practices with broader sustainability goals [9-12]. The emphasis on "what gets measured gets done" underscores the importance of robust metrics and transparent reporting to drive meaningful change in the industry [10]. However, achieving sustainability requires recognizing the interdependencies between environmental, social, and economic factors and addressing them collectively [7,8].

Emerging trends in sustainability in the fashion industry continue to evolve with a clear shift towards circular economy models and greater transparency, reflecting an increased commitment to environmental and social responsibility. As per The Sustainable Fashion Forum, in 2024 the focus has majorly been on reducing waste by rethinking product life cycles [13]. Circular fashion involves designing garments that are not only recyclable but can also be upcycled, reused, or rented and close the loop until it is found no longer in use. Companies are adopting these strategies, such as incorporating recycled materials, to minimize waste and encourage responsible consumption. The growing adoption of Digital Product Passports, which can track a garment's journey through its entire lifecycle, aiding in recycling and ensuring more informed consumer choices [14].

Alongside environmental sustainability, ethical production is gaining traction. Companies are being held accountable for the fair treatment of workers, with rising activism and new legislative efforts like the Fabric Act aiming to improve conditions in garment production. Increased transparency and ethical labour practices are becoming integral to brand identities. Digital tools, like blockchain, are helping enhance transparency and traceability throughout the supply chain. These tools provide greater visibility into sourcing, production processes, and product lifecycle, which are crucial for supporting circular economy principles. Circular economy models, ethical practices, and digital innovations are at the forefront of this transformation, paving the way for a more responsible and sustainable future.

In the context of South Africa, the fashion and textile industry face unique sustainability challenges. The sector is a significant contributor to solid waste production, largely due to the prevalence of low-cost garments as a result of fast fashion and high consumption rates [15,16]. The fast fashion model has led to a surge in various types of waste such as manufacturing offcuts, rejected garments, discarded clothing and accessories [17]. South Africa's limited waste management infrastructure exacerbates these issues, with only 64% of the population having access to waste collection services, making recycling efforts both costly and challenging [18,19].

Moreover, the environmental impact of synthetic materials, which dominate fast fashion products, is particularly concerning. These materials, often derived from petroleum, degrade slowly and contribute to long-term environmental pollution, including significant contributions to ocean plastic pollution [6,20]. South Africa is among the top contributors to marine plastic pollution, underscoring the urgency of adopting sustainable practices across the fashion value chain [21].

Addressing these challenges requires a multi-faceted approach that includes reducing plastic consumption, enhancing recycling capabilities, and promoting sustainable consumer habits [1]. The fashion industry must also innovate in production processes, waste management, and recycling technologies to minimize environmental impact. Effective implementation of these strategies at scale is crucial to mitigating the industry's contribution to global environmental problems and ensuring a sustainable future [1,4].

Silva et al. reported on circular economy strategies and practices in a fashion retail brand [22]. There retail brand achieved an improvement in waste management and product lifecycle by addressing and implementing issues related to sustainability and environmental management. The authors suggested three cycles, the first cycle was on identifying the project, the second cycle was on the circular economy strategy plan and the third cycle was based on the implementation with the company. Each of these cycles is based on plan, act, collect, and reflection stages. One of the limitations of this research was it was based on one company but can be broadened by increasing the number of companies and adding the consumer behaviour aspect.

Ronda reported the barriers to buying sustainable clothing and the consumer experience in buying such items as compared to fast fashion items [23]. Some of the factors which contributed to the fast fashion behaviour were high prices and low visibility of sustainable fashion, lack of trust in fast fashion claims, and limited consumer awareness and knowledge about the impact of fast fashion. Some of the consumers were willing to pay more for sustainable fashion but they were not able to get their preferred style and choices from it.

To educate Generation Z consumers and create awareness about sustainable fashion and textiles, Chang et al. explored the existing knowledge around sustainability and how to improve existing knowledge [24]. They reported that Generation Z consumers have limited knowledge of sustainability,

but they were aware of the environmental impact of fast fashion. The existing knowledge was improved through group discussion among participants as well as browsing through the videos and websites related to sustainability. Through this process, consumers also gain knowledge towards the social aspect of sustainability.

In a recent paper, Solis et al. 2024 reported the importance of waste management in the textile and fashion sector [25]. To achieve this, there must be cleaner production processes across the value chain along with a focus on reducing the consumption of clothing from the consumers. Such type of interventions could lead to a reduction in global warming to 22.3 metric tons CO₂/year which is equivalent to 18% sector-wide impact by 2035. The estimated investment required for such interventions would range between 7-33 billion Euros for Europe.

The 2020 Circular Economy Action Plan and the 2021 update of the EU Industrial Strategy identify textiles as a key product value chain with an urgent need and a strong potential for the transition to sustainable and circular production, consumption, and business models [26,27] In the local context, GreenCape recently published an industry brief highlighting the importance of incorporating circular economy principles into the local clothing sector and more specifically, the report identifies the recycling of textile waste as a key driver toward the pursuit of a circular textile supply chain with emphasis on keeping the value of textile waste as high as possible for as long as possible while recycling close to market [28].

As per GreenCape, recent literature on sustainability in South Africa's clothing retail sector reveals several notable gaps, particularly with textile waste management and its environmental impacts. Currently, textile waste in South Africa is often categorized under general waste, which prevents accurate tracking and hinders targeted waste management strategies. Without precise data on the types and amounts of textile waste, including fibre composition, it becomes challenging to develop effective recycling and disposal methods [28].

Another gap lies in understanding and evaluating the environmental impact of existing recycling programs. Although some retailers have implemented recycling initiatives using sustainable fibres, these programs are not without their limitations. For instance, while recycled polyester reduces reliance on virgin materials, it still contributes to microplastic pollution, and the mixed-material composition of some garments complicates further recycling. Additional research is necessary to assess the full ecological costs and benefits of these recycling practices, to guide more sustainable approaches within the sector.

Lastly, there is a lack of robust policy and regulatory frameworks specific to textile waste and sustainability in fashion. Unlike other countries with strict regulations around textile imports and waste management, South African environmental policies currently overlook textile-specific issues. Addressing these gaps aligns with broader sustainability objectives for South Africa's clothing retail

sector. Improved data collection on textile waste, a stronger focus on circular economy practices, and updated policies could reduce the industry's environmental footprint and foster sustainable transformation.

There are several clothing retail brands in Cape Town have initiated sustainability programs to mitigate environmental impacts, focusing on ethical sourcing, waste reduction, and eco-friendly practices:

1. Woolworths – The company is known for its “Good Business Journey” program, where it promotes sustainable sourcing, eco-friendly packaging, and reducing water usage. The retailer focuses on responsibly sourcing cotton and aims for a circular fashion approach.
2. Mr Price – Mr Price’s “Eco Denim” initiative incorporates recycled water and sustainable materials in denim production, that aims to minimize water and chemical use in its manufacturing processes.
3. Pick n Pay Clothing – Pick n Pay has introduced collections made from sustainable fibres like organic cotton and recycled polyester. It also emphasizes responsible supply chain practices and reducing the use of plastics.
4. Superbalist – As an online retailer, they encourage sustainable fashion by promoting brands that are associated with eco-friendly practices and supporting “circular” fashion items.
5. Cape Union Mart – This outdoor and adventure retailer has introduced initiatives when it comes to reducing its carbon footprint, including the use of recycled materials in selected products and promoting energy-efficient practices in their stores.

These initiatives reflect a growing trend in South Africa majorly Cape Town-based retailers to incorporate sustainability, align with consumer expectations, and address environmental concerns.

Based on the above, the research questions are:

- At present, what are the key attributes defining the retail cycle of clothing and fashion companies based in Cape Town?
- What is the impact of the retail cycle on the local environment's sustainability due to the generation of clothing and textile pre-consumer waste?
- Through an examination of the operations of two leading retail companies headquartered in Cape Town, possible ways to develop a sustainable retail cycle with a specific focus on reducing pre-consumer waste generation?

This study aims to analyse and evaluate the company's retail merchandise cycle comprehensively and to devise an enhanced retail merchandise cycle model that outlines strategies for reducing or eliminating the quantities of waste generated. The objective is to examine and assess the existing retail cycle of a specific retail chain, pinpointing the stages within the cycle that potentially generate the highest amount of waste. Also, to devise an enhanced retail cycle model aimed at minimizing clothing and textile waste, thus mitigating their detrimental effects on the local environment's sustainability.

RESEARCH DESIGN

The research paradigm adopted for this study was a combination of subjectivist and interpretivist approaches. Qualitative research methods were used to interpret verbal data, in contrast to the positivist paradigm used in quantitative research, which relies on scientific methods along with analysis of quantifiable data. An empirical interpretive method was employed, involving qualitative data interpretation gathered from conversations, and observations, and to develop theories about the phenomena of interest, rather than testing hypotheses. This case study focused on two retail companies in Cape Town, referred to as Company R and Company A. Company A has more than 700 stores spread across Southern Africa and its headquarter is based in Cape Town. As per the South African consumer satisfaction survey in 2015, Company A was rated the second-best clothing store. Company R is a South African company focused on the discount retail markets. Company R operates mainly in South Africa, and other African countries as well as Brazil. It manages a wide range of market segments including clothing, footwear, homeware products, household furniture etc. In the first phase of this study, a thorough analysis of different retail cycle phases of two retail chains headquartered in Cape Town has been carried out. This was conducted to develop a model that minimizes adverse impacts considering local environment sustainability.

Methodological Approach

The planned study takes a holistic approach, comprehensively examining the companies' operations by investigating each of the processes and their connection within the organization. The primary objective is to identify textile and clothing waste that is adversely impacting sustainability, ultimately leading to the development of an improvised retail cycle. A narrative was developed by listening to the participants as they explained their roles and responsibilities in the company. Analysing the verbal data provided by participants allowed for an understanding of the purpose of each company, the role played in the retail cycle, and its interconnection with other units. Additionally, observing the tones, verbal expressions, and physical mannerisms of participants provided crucial insights into their subjective perceptions, beliefs, and opinions. The questions were designed to gather detailed descriptions of the retail cycle phases and to understand the reasons behind their specific configurations. After collecting the data, qualitative methods were used to ensure comprehensive data collection and validation of the information provided by the participants. An improved retail cycle model was developed based on the collected data, focusing on the local environment sustainability.

Sampling

Sampling for the survey was conducted across experts from all relevant departments. However, for the interviews, buyers were specifically identified and interviewed. The selection of buyers was based on their comprehensive understanding of the entire retail cycle, both within their companies and in external contexts. 8 buyers and 40 experts were selected as the sample representatives. The study began with obtaining ethical clearance to disclose the company's identity without violating research ethics and sending invitations to all retail clothing companies based in Cape Town. They were updated on the possible reason for the interview and what the researcher intends to obtain out of it. The survey participants were experts from various departments of the selected companies R and A. There were a range of open-ended questions that were created keeping the research aim in mind. During the interviews, all retail cycle stages were mapped, and a model was created by integrating the retail stages. Subsequently, participants, especially buyers were identified, and interviews were conducted with each of them. The reason for selecting buyers was that they would be the ones who would have a good understanding of the retail cycle from beginning to end within and outside their companies. The initial step of the research involved identifying phases of the retail cycle that generated textile and clothing waste, as well as used textiles leading to the depletion of natural resources. The existing retail cycle model served as a starting point for the investigation. This allowed for an appropriate basis to assess the study's findings and ultimately an improved retail cycle model was developed aimed at minimizing threats to the local environment arising from waste generated in the current retail cycle.

RESULTS AND DISCUSSION

Retail clothing companies in Cape Town benefit from sourcing apparel from Asian countries due to competitive pricing, diverse styles, and manufacturing efficiency. These manufacturers offer lower production costs, allowing Cape Town retailers to offer affordable options that appeal to price-sensitive consumers while maintaining profit margins. Additionally, the wide range of styles and quick production cycles in countries like China and Bangladesh enable rapid response to fashion trends, keeping local stores stocked with in-demand items. However, companies must address consumer demand for transparency by ensuring ethical sourcing, fair labour, and quality control, blending affordability with responsible production to build brand loyalty and addressing burning issues around sustainability and waste management. The study found various interesting facts, with updates on what companies intend to do in the long run.

An accurate assessment of waste quantities (pre- and post-consumer) can be done by identifying retailer-generated wastes like textile and clothing waste. An improved retail cycle could be developed from the analysed data which in turn improves the sustainability aspects of local environments.

Examining and assessing existing retail cycles

As both retail companies fall within the same market segment therefore the retail cycle looks the same (Figure 1). To carry out the retail cycle and its phases, each component has been given a name which links to the functions of a specific department. The findings shed some light on the routines of individual participants along with the operations of the specific departments and the different types of waste generated by the departments. Depending on their structure many types of waste take several years to degrade [20].

The initial stage of the retail cycle, involving trend research and design, is an opportunity to be environmentally sustainable. Company R has started reducing its carbon footprint by implementing digital methods, such as online meetings and in-house design processes, which minimize paper usage. However, with the increase in online sales due to the pandemic, the usage of single-use plastics (polybags) has also risen. Although sustainability was not the primary focus during the pandemic-induced changes, it has highlighted the need to reconsider and optimize certain processes for the company's environmental impact.

When inquiring about Company R's approach to becoming a more sustainable fashion business, management stated that the company is actively exploring ethical and sustainable practices. Sustainability is one of the main business focuses within Company R. Company A mentioned that although South Africa as a country doesn't have a good buy-in yet at the sustainability level, they have figured out alternate ways to bring in the sustainability into their business and the first product outcome will fall part of Summer 2024 collection.

The research revealed that while the retailer assesses suppliers on ethics related to environmental impact, there is a lack of supplier processes relating to sustainability aspects. At present, it indicates a lack of compliance policies related to sustainability. Company R currently does not have specific regulations on sustainability, as stated by the interviewee, whereas Company A already has talks with suppliers and manufacturers in Asia who are willing to produce sustainable raw or semifinished materials to create finished products.



Figure 1. Retail cycle stages

The product team normally consists of several key roles, including a buyer, an assistant buyer, a designer, a planner, and a product technologist. These team members collaboratively manage the product lifecycle through what is called a circular business model, as illustrated in Figure 1. This model operates continuously, following a structured seasonal cycle for each of the four fashion seasons: spring, summer, autumn, and winter. Each season's cycle flows from start to finish, after which it seamlessly resets for the next cycle.

Notably, while one season's cycle is in motion, the cycle for another season is running simultaneously, though at different phases. For example, while the winter season may be in the early phase, the autumn season might be moving into production or distribution. This overlapping of cycles allows the product team to maintain a continuous flow, ensuring that each season is well-prepared and launched on schedule. This cyclical approach supports efficient resource management, timely market responses, and adaptation to seasonal trends.

By employing a circular model, the team can integrate sustainable practices, encouraging reuse and minimizing waste, while also delivering timely and relevant products to meet consumer demand throughout the year. This structure supports the fashion chain's goal of maintaining continuity, efficiency, and a commitment to sustainability in its operations.

Without accountability and well-defined guidelines for the pillars of sustainability, profit-driven motives may overshadow sustainable practices [29]. The retail industry has a significant impact on global pollution. In many retail structures, the focus on sustainability concerning the environment takes a backseat to profitability. Sustainability, when mentioned by retailers, can encompass various aspects and is not solely limited to environmentalism, especially concerning clothing and textile waste [29]. Additionally, sustainability involves marketing ethos, brand ethics, and social responsibility efforts and it is not a function of a single department.

Stages that generate the highest amount of waste

Regarding environmental sustainability, the study identified textile and clothing production as significant contributors to waste generation. While some efforts have been made to source conventional fibres and fabrics with environmental sustainability in mind, it is evident that alternative solutions must be explored, and conventional practices should be replaced to foster a more sustainable business model. Company R heavily relies on high percentages of cotton, however, for Company A it's about rolling out only one segment i.e. a few new styles into the whole business. However, traditional production methods of cotton use various chemicals, and responsible water management becomes crucial for sustainable cotton farming. Improper water management by cotton farmers can have long-term effects not only on cotton growth but also on the surrounding communities that share water resources. Cotton production is a water resource-intensive process and it impacts the water quality as a result of excessive use of pesticides and fertilizers. Regarding the fast fashion phenomenon, manufacturers rush to produce large quantities of clothing to maximize profits, often resulting in low-quality apparel. Such low-quality garments tend to be replaced quickly with the next season's fast fashion offerings, leading to increased waste generation [30].

The factories in Bangladesh and India are suppliers for Company R. These factories follow some aspects of sustainability by sourcing materials from sustainable sources, environment-friendly dyeing processes etc. Company A mainly sources from India. However, the company is still in the initial stages of evaluating supplier compliance with environmental regulations. The team member of Company A mentioned that while ethical audits are conducted, there are no clear guidelines or policies for environmental sustainability at present. The lack of environmental sustainability guidelines within the company also extends to the suppliers.

The buying and sourcing departments play a major role in evaluating product sustainability. The buyers select fabrics for the garments, and the common use of polyester poses environmental challenges [31]. The briefing stage with suppliers provides an opportunity to discuss sustainable fibre sourcing and production methods. The move towards utilizing 3D technology for garment fitting is a positive step to reduce physical samples and waste in the retail cycle. However, further efforts are needed to address the significant environmental footprint of the industry and promote sustainable practices throughout the retail cycle.

Textile waste is a growing concern globally, and the fashion industry is one of the most polluting industries. Assorting textile waste can be more manageable for manufacturers, and some have already recognized the profitability of recycling textile waste [29]. In the case of Company R, they have not focused on sustainability and because of this, employees were not well trained on environmental sustainability practices. The management of Company R transparently states that sustainability is a part of individual responsibility, leaving it up to employees to decide whether to practice sustainability. When questioned about how employees are informed and encouraged to practice environmental responsibility, management's response pointed to the prioritization of survival during the COVID-19 pandemic, suggesting that profitability was the focus rather than sustainability. The sustainability pillars encompass human, social, economic, and environmental aspects, where economic survival is also crucial for overall sustainability [32,33].

Retailers, including Companies R and A, can influence society and promote a more sustainable environment by finding a balance between market demands and stakeholder expectations. Pressuring suppliers to adopt sustainable manufacturing practices and encouraging changes in consumer behaviour can contribute to sustainability. To achieve sustainability, educating and involving staff in sustainable practices is very important, as they are key role players in advocating the company's ethics to consumers [34]. Regular staff training on sustainability philosophy and its impact on the retail cycle is essential to ensure a shared understanding and commitment to sustainable values [35].

Company R's current sustainability strategy revolves around providing consumers with high-quality products. This approach is emphasized by both management and employees. However, the business does not have any formal sustainability conformance laws in place yet but aims to focus on adhering to good quality standards focusing on the longevity of garments and reducing the garment disposal frequency. Buyer A also mentioned the importance of ensuring suppliers do not take shortcuts that may harm the environment, even if they are cost-effective. Company A on the other hand has policies in place and has been on this journey for quite a while. Due to red tape, it has been difficult for them to get the policy approval completed which could then be implemented for all clothing retail companies in South Africa.

During the interview, it was revealed that some suppliers have manipulated test results. For instance, a product may pass the test for colourfastness, but it may fail the actual fabric test. This can result in customers encountering issues with the garment, such as colour loss and staining of other clothing items. Therefore, customers may return the item or dispose of it prematurely due to subpar colour fastness. To truly achieve sustainability, Company R needs to establish conformance laws and implement regular testing to ensure supplier compliance with standards related to sustainability. This proactive approach would help to maintain the company's commitment to providing quality products while minimizing environmental impacts.

Enhanced retail cycle model aimed at minimizing clothing and textile waste

The presented retail cycle model plays a central role in providing possible solutions derived from the research (Figure 1). This model is versatile and can be adopted by Companies R and A but also by other businesses. However, it's important to note that the above model does not encompass all pollution areas, such as wastewater, supplier/factory production waste, energy, paper and e-waste etc.

In today's consumer-oriented world, clothing retail companies, including Company R, should seriously consider adopting this sustainable retail business model. As consumer demand increases, so does the need for retailers to produce more. By improving their business models, communication strategies, internal processes, and employee engagement, retailers can contribute to reducing the environmental impact caused by fashion and textile waste, as highlighted in the research. Natural textile production, blended textiles, and synthetic textiles all have their environmental challenges, necessitating a shift towards sustainability. Sustainability efforts should begin with waste prevention and reduction, strengthening internal waste management systems, recycling practices, and responsible disposal of waste. Recycling can add value for retailers like Company R, which enjoys support from the larger retail groups. Leveraging its position and relationships within industry, government, and educational institutions, Company R can actively drive sustainability initiatives with a focus on recycling.

When assessing the impact of projects or policies, it's important to consider various economic, environmental, and social variables. Economic variables encompass factors such as income, expenditures, taxes, business environment and diversity. Environmental variables consider various natural resources and their potential influences on the quality of air and water, consumption of energy, use of natural resources, management of waste, and pollution. Social variables focus on the community's or region's social elements, education, access to resources, equity, health and quality of life. Examining long-range trends for each variable can help businesses like Company R and A make informed decisions and assess the consequences of their actions on the environment, economy, and society.

CONCLUSION

Sustainability was not a central focus within the retail cycle. It was evident that employees within the retail environments may lack both awareness and practical application of sustainable measures. This lack of focus on sustainability is problematic, considering the substantial role that the retail sector plays in environmental waste production. A detailed examination of the retail cycle revealed that the only phase showing minimal waste production was the post-seasonal strategy and distribution phase. Some factories are increasingly prepared to supply garments made from sustainable materials. Furthermore, there is a growing willingness among employees to embrace sustainable practices, and buyers could make more informed choices, such as opting for virgin polyester over recycled polyester. These findings suggest that there is room for positive change and that both supply chain actors and consumers have roles to play in enhancing sustainability.

The study also identified significant gaps in sustainability practices, particularly concerning cotton production. Additionally, while the usage of single-use plastic bags has been removed from consumer-facing areas of stores, retailers continue to use single-use polybags internally. The improved retail cycle model developed through this study aims to address these challenges by preventing textile and clothing waste from becoming significant pre- and post-consumer waste. By adopting this model, Company R could improve its sustainability practices, at the same time lower its ecological footprint, and set a positive example for the clothing and fashion industries. Implementing these recommendations would not only help mitigate the environmental impact of the retailer's operations but also contribute to broader sustainability goals.

Although the study identifies opportunities for improvement—such as adopting sustainable materials and reducing single-use plastics in retail operations—the lack of specific guidelines on how companies could enact these changes limits its practical application due to a lack of policies and frameworks and at times resistance from the corporate world.

The study could be strengthened by outlining clear, step-by-step actions that retailers could take to promote supplier compliance with sustainability standards or to reduce waste across different phases of the retail cycle. Recommendations could be having supplier audits, setting waste reduction targets, and offering training on sustainable practices for retail staff would provide companies with more concrete guidance that could be incorporated effectively throughout the supply chain and not just at the retailer level. Additionally, incorporating techniques for managing textile waste in both pre-and post-consumer stages, such as through recycling programs or take-back initiatives, would add substantial value. By focusing on specific operational changes, the research could make a more significant impact, supporting the clothing retail sector in addressing environmental challenges and aligning with sustainability goals.

Author Contributions

Conceptualization – Patnaik, S; methodology – Patnaik, S; formal analysis – Patnaik, S; investigation – Patnaik, A; resources – Patnaik, A; writing-original draft preparation – Patnaik, S; writing-review and editing – Patnaik, A; visualization – Patnaik, S; supervision – Patnaik, A. All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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