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UNRAVELING CLOTH RECYCLING TRENDS: A CONSUMER BEHAVIOR PERSPECTIVE USING SCOPUS AI

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Abstract:

This paper presents a data-driven systematic review of global cloth recycling trends through the lens of consumer behaviour, utilising Scopus AI to synthesise cross-disciplinary literature. While the fashion industry generates 92 million tons of textile waste annually, only 15% to 20% is currently collected for recycling, highlighting a critical need for circular interventions. The study identifies four interconnected pillars: the environmental pillar, which shows that while recycling significantly reduces resource depletion, its benefits depend on high material substitution rates; the industrial pillar, which tracks the transition from traditional upcycling to modern chemical recycling standards; the technological and economic pillar, examining how AI-enabled sorting improves fiber identification accuracy despite high capital costs and the lack of Extended Producer Responsibility (EPR) frameworks; and the human pillar, which reveals a significant "attitude-behaviour gap". By integrating these findings into the Theory of Planned Behaviour (TPB), the research develops a conceptual framework where technological innovation and policy instruments act as primary drivers for a consumer's perceived behavioural control. The results suggest that bridging the gap between environmental awareness and actual participation requires shifting recycling from a high-effort task to a convenient "default" choice through automated infrastructure and stable policy incentives. This review offers essential insights for stakeholders aiming to enhance cloth circularity by aligning macro-level industrial advancements with micro-level consumer psychology.

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Introduction

The fashion industry has experienced unprecedented growth over the last several years, driven by strong consumer demand and rapid product cycles. This growth has resulted in great environmental effects in the form of textile waste (Laitala, 2014). Globally, approximately 92 million tons of textile waste accumulate at various stages of their life cycle, with post-consumption accounting for 50% of the total rubbish (Ellen MacArthur Foundation, 2017; Global Fashion Agenda, 2021). With only 15% to 20% of waste being collected for reuse and recycling, and more than 80 % of clothing waste being discarded in landfills for dumping or incineration, leading to higher carbon footprint, energy, and raw material losses (Gupta et al., 2022; Shamsuzzaman et al., 2023). Therefore, the recycling of clothes has emerged as an indispensable measure to reduce environmental erosion, yet its success would greatly rely on the involvement of consumers and their behavioural disposition (Han et al., 2024). It is important to understand the main motivators of consumer attitudes and participation in cloth recycling to design effective policies and programs.

Despite rising consumer interest in sustainability, the majority continue to discard clothing in landfills, driven by convenience, limited access to recycling facilities, and insufficient knowledge about which garments can be recycled (Zhang et al., 2020). Perceived usefulness, established social norms, and convenience are three factors that significantly impact recycling behaviours (Iordachi et al., 2024). Although Online Clothing-Recycling Platforms (OCRPs) are a great way to get rid of old clothes, only about 10% of customers really utilise them on a regular basis (Zhang et al., 2020). The results show the complexity of the variables that hinder sustainable fashion consumption on a large scale, including psychological, social, and structural aspects.

Multiple studies have investigated consumer behaviour in cloth recycling, concentrating on motivation, barriers, and perceptions of recycled garments, such as second-hand or thrift cloth (Jalil & Shaharuddin, 2019; Kumagai, 2021). Studies show that even while people are becoming more conscious of environmental issues, the high cost and lack of availability of sustainable clothing are still making it less appealing to customers. Demographic factors such as age, gender, and income substantially affect disposal and recycling behaviours, highlighting the necessity for further investigation (Grillo-Méndez et al., 2022). Despite the current literature providing critical information, there is still a lack of thorough studies that bring together various opinions, emerging trends, and industry-specific problems.

A major gap in contemporary research is the absence of a systematic, AI-supported review that synthesises global studies on clothing recycling and consumer behaviour. To address this gap, the present study employs Scopus AI to conduct a comprehensive, data-driven analysis of the literature, map the research landscape, identify emerging themes, and propose a conceptual framework for future work. The study aims to (1) trace the evolution of research in this field, (2) develop a conceptual map of key themes and seminal studies, (3) synthesise the contributions of leading scholars, and (4) identify future research directions in consumer behaviour related to clothing recycling. Unlike traditional bibliometric reviews that often focus on quantitative citation metrics, the AI-driven approach in this study enables a rapid, thematic synthesis of cross-disciplinary literature. This allows for the immediate identification of 'latent' connections between technological sorting advancements and psychological barriers to recycling, which are typically treated in isolation in manual reviews.

This study adopts a holistic circular economy perspective, contrasting with previous reviews that focus solely on the technical aspects of recycling or the psychological motives of consumers in isolation. While the scope encompasses technological, policy, and economic dimensions, these are intentionally framed through the central lens of consumer behaviour. By doing so, this research moves beyond a descriptive summary of disparate fields; instead, it analyses how macro-level factors such as AI-driven sorting technologies and Extended Producer Responsibility (EPR) policies directly shape the micro-level 'choice architecture' of the consumer. This integrative approach allows for a deeper understanding of the cloth recycling ecosystem as a socio-technical system where consumer participation is the critical dependency.

This present study contributes to the existing literature by employing AI-based analysis tools to offer an overview of how individuals act to recycle unwanted clothes. The findings can help policymakers promote sustainable consumption by identifying key drivers, barriers, and emerging trends. Furthermore, the study emphasises the potential of AI as a scientific tool, demonstrating its usefulness in discovering patterns and creating new information in sustainability research.

The paper is structured as follows. Section 2 outlines the methodological framework, including data collection through Scopus AI and the analytical techniques employed. Section 3 presents the key findings, the conceptual map, and the dominant themes related to consumer behaviour. Section 4 discusses the implications for academic research, industry practice, and policymaking. Finally, Section 5 offers concluding remarks along with recommendations for future research and practical applications.

Methodology

The study uses Scopus AI, an emerging method for conducting systematic reviews, to analyse the development of clothing recycling research through the lens of consumer behaviour. The analysis was performed with the Scopus Trial on 18 March 2025 to capture the latest scholarly work. The methodological process is structured into four phases: summary insights, concept map development, identification of topic experts, and analysis of emerging themes (see Figure 1).

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Researchers used Scopus to locate the literature using the following query:
("cloth recycling" OR "textile recycling" OR "fabric recycling" OR "apparel recycling") AND ("consumer behaviour" OR "consumer attitude" OR "consumer preference" OR "purchasing behaviour") AND ("sustainability" OR "environmental impact" OR "eco-friendly" OR "green practices") AND ("trends" OR "patterns" OR "changes" OR "developments").

The process ensured that this paper only identified research that was pertinent to the cloth recycling process and consumer behaviour within a sustainability framework. The chosen articles were, in turn, summarised by Scopus AI, which generated summary insights featuring primary themes, knowledge gaps, and new trends. A concept map was also created to connect the main ideas. To verify the results and enhance the knowledge, expert opinions and the most-referred authors were verified.

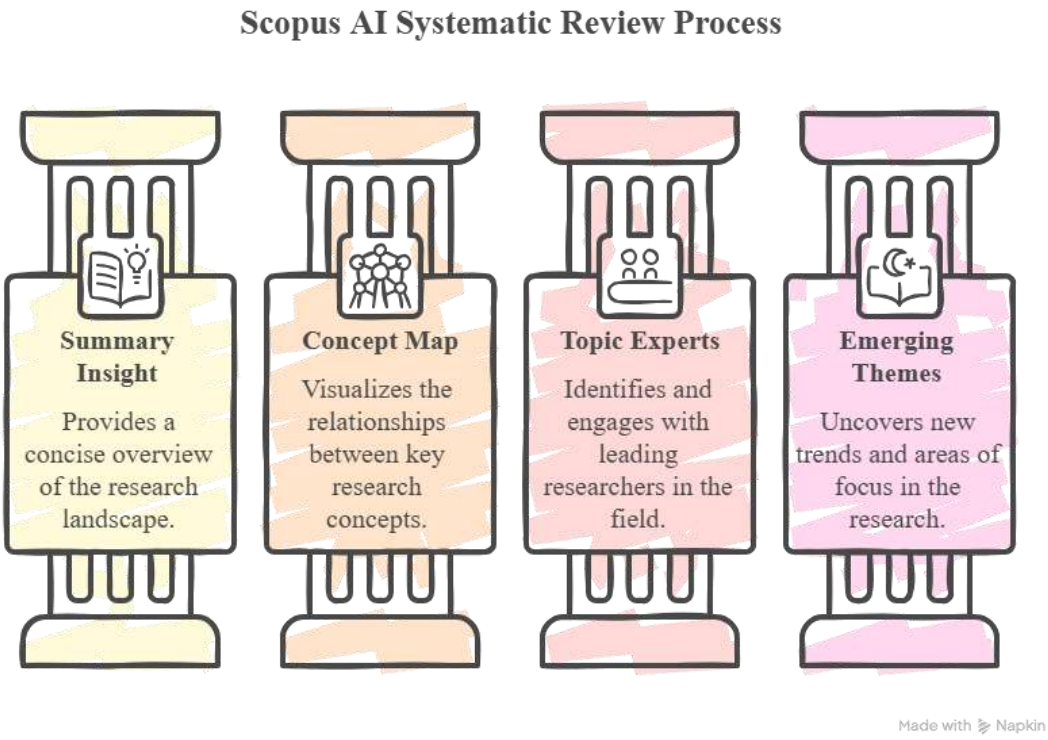

Figure 1: Scopus AI Systematic Review Process

This study carefully aggregates information on cloth recycling from the viewpoint of consumer behaviour, utilising an evidence-based methodology. It employed summary analysis, expert opinion, and thematic mapping to find important trends in textile recycling, consisting of how digital platforms are becoming more important, changes in the law, and how people act. The Theory of Planned Behaviour (TPB) integrates social and psychological factors to assess consumer participation in sustainable practices. Moreover, data from reputable scholars and institutions provides a solid basis for additional research into textile circularity. This study also gives important views to businesses, governments, and researchers who want to encourage more ecologically friendly clothing practices.

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Results and Discussion

To maintain analytical depth across the broad dimensions identified by Scopus AI, the following sections evaluate the findings based on their impact on the consumer journey. Technological and economic factors are discussed specifically in terms of how they improve 'Perceived Behavioural Control' (convenience and accessibility), while policy dimensions are analysed for their role in shifting 'Subjective Norms' and social accountability.

Thematic Analysis: Four Pillars of Cloth Recycling

The Scopus AI synthesis identifies four distinct yet interconnected pillars that define the current landscape of cloth recycling. To provide a deeper analytical transition into the theoretical framework, these pillars are detailed below as the foundational evidence for synthesis.

The Environmental Pillar: Impact and Awareness

The environmental impact of recycling clothes has been a subject of scholarly concern, and there is substantial evidence that recycling and reuse of clothes significantly reduce environmental harm (Gonzalez et al., 2023). From the studies, reuse and recycling of clothes are less environmentally degrading than incineration and landfilling because they lower greenhouse gas emissions as well as depletion of resources (Sandin & Peters, 2018). However, these benefits do not apply in every situation. When recycled products do not sufficiently replace virgin materials, or when virgin production is already relatively low impact, the environmental advantages of recycling can be weakened or lost. Therefore, improving recycling efficiency and increasing substitution rates are essential to achieving the greatest environmental benefits (Espinoza-Pérez et al., 2024).

Reducing the impact on the environment requires a variety of recycling technologies. Among the most researched techniques are mechanical or chemical fibre-to-fibre recycling and polymer or oligomer recycling, particularly with common materials like cotton and polyester (Sandin & Peters, 2018). These techniques are empirically verified by life cycle assessment (LCA) studies (Pranta et al., 2025a). In comparison to virgin cotton fabric, a recent life cycle assessment (LCA) of mechanically recycled cotton blended with virgin cotton revealed that the production of 1 kg of fabric with recycled input decreased greenhouse gas emissions, water footprint, air pollution, and land use (Roy et al., 2023).

Cloth recycling has a lot of potential, but it still has a lot of problems to deal with, such as contamination, a lack of infrastructure, and collection systems that malfunction well (Pattanayak et al., 2025). The fashion industry has a huge carbon footprint and pollutes the water, which makes it even more important to recycle better (Shahid et al., 2024). Recycling technologies like pyrolysis and nanofiber production are exciting new ideas because they make it easier to break down and recycle cloth waste (Wagaw & Babu, 2023). These technologies can make recycling more cost-effective and less harmful to the environment.

Both the policymakers and industry leaders have a significant role in the integration of sustainable recycling within the fashion waste stream (Abdelmeguid et al., 2024). It has been shown that collecting and processing more used clothing can greatly reduce the environmental impact (Moazzem et al., 2021). The sustainability of textile recycling can also be increased by implementing circular economy principles into practice, such as designing for recyclability,

product durability, and enhancing waste management infrastructure (Khan et al., 2025). The gaps in textile waste management can be filled by creating standard recycling procedures and rewarding good consumer behaviour (Ramírez-Escamilla et al., 2024).

To sum up, cloth recycling is a good way to address the environmental concern of the fashion industry. Even though there has been a lot of progress, long-standing issues still require constant innovation and robust policy support. Stakeholders can maximise the environmental benefits of cloth recycling and support the transition of the textile industry toward greater sustainability by developing recycling technologies, enhancing collection systems, and encouraging sustainable consumer behaviour.

The Industrial Pillar: Practices and Standards

The fashion industry has shifted towards more sustainable practices, and cloth recycling has been one of the contributing factors in reducing environmental degradation (Kim & Lee, 2025). Various recycling technologies have been researched, including mechanical, chemical, and biochemical recycling processes for generic fabrics used in cloth (Baloyi et al., 2024). Islam et al. (2025) stated that chemical and biochemical recycling processes break down cloth materials into raw components for the production of new fibres, whereas mechanical recycling involves shredding fabrics into fibres to be recycled. These developments demonstrate the industry's commitment to resource efficiency and sustainable clothing management.

In addition to contemporary recycling techniques, conventional methods play a major role in reducing cloth waste. Cloth waste is recycled and upcycled in India using traditional methods like Kathputlis, Sujani, and Kantha, which support sustainable cultural practices (Singh & Rani, 2021). The techniques preserve craftsmanship and generate revenue for artisans in addition to offering a green alternative for discarding cloth. Combining traditional and modern recycling techniques improves the fashion industry's ability to manage waste sustainably.

Even with these developments, there are still many obstacles in the way of expanding recycling technologies. The industry is hampered by the collection, sorting, and reuse procedures, which are typically limited by inadequate infrastructure and financial considerations (Seifali Abbas-Abadi et al., 2025). Effective recycling systems are further hampered by low levels of consumer awareness and participation (Kim & Lee, 2025). Promising advancements like more integrated recycling systems and sophisticated sorting technologies, however, present chances to get past these obstacles and raise clothing recycling rates. (Baloyi et al., 2023). The industry's approaches to product design and lifecycle management have also changed as awareness of sustainable practices has grown. To reduce their impact on the environment, businesses are increasingly looking into long-lasting, recyclable materials and encouraging environmentally friendly disposal methods (De Felice et al., 2025). Sustainable industrial practices have benefited greatly from the application of circular economy concepts, such as extended producer responsibility (EPR) and take-back programs. They reduce textile waste and stimulate innovation in the production of green textiles (Seifali Abbas-Abadi et al., 2025).

Globally, programs like the Global Recycle Standard (GRS) have been very important in getting people to recycle cloth. The GRS makes sure that recycling is traceable, environmentally friendly, and socially responsible. This forces fashion brands and manufacturers to engage in sustainable production methods (Textile Exchange, n.d.). By following these standards, the industry can make recycling operations more open and

accountable, which will lead to a more sustainable and responsible fashion industry (De Felice et al., 2025). In the future, cloth recycling in business will depend on constant innovation, government support, and consumers' involvement (Kim & Lee, 2025).

The Technological and Economic Pillar: AI and Infrastructure

Research examining the role of artificial intelligence in clothing recycling remains limited. However, recent studies indicate a growing adoption of digital technologies, particularly online clothing recycling platforms (OCRPs), as alternative channels for textile disposal (Zhang et al., 2020). Despite the convenience these platforms offer, user participation remains relatively low. Empirical evidence suggests that this underutilization is largely influenced by consumers' environmental consciousness, perceived convenience of the platforms, and social influences (Han et al., 2024). Moreover, although AI has considerable potential to enhance the efficiency of waste management systems, its practical implementation is constrained by substantial structural challenges, including high initial investment costs and concerns regarding the protection of personal data. High initial capital investment and the complexity of maintaining data security pose challenges to widespread adoption. Furthermore, the lack of Extended Producer Responsibility (EPR) frameworks in developing economies creates a scalability gap, as the high processing costs of AI-driven infrastructure may not yet be economically viable without stable policy incentives or secondary raw material markets (Lakhouit, 2025).

In industrial settings, AI-enabled sorting using spectroscopy and machine learning has proven effective in laboratory environments for identifying fibre compositions with high accuracy. However, the transition from these controlled pilot studies to full-scale commercial application remains an emerging development, particularly for complex garments featuring mixed-material blends and chemical finishes. A recent systematic review by Faghih et al. (2025) showed that AI-enabled sorting systems often use computer vision or spectroscopy along with machine-learning models to make the sorting more accurate and scalable. These are two big problems in textile-to-textile recycling that are especially hard to solve when clothes are made of mixed materials and have complex finishes (Faghih et al., 2025). Tsai and Yuan (2025) proved that combining spectroscopy with machine learning and deep learning classifiers can group waste textiles by fibre composition with a lot of accuracy. This is important because cleaner input streams lower contamination and make higher-value recycling possible instead of downcycling. At the same time, policy-driven digitisation (like digital product passports) is expected to make AI even more powerful by giving sorters and recyclers easier access to data on how products are made and how long they've been used, thus helping people make better decisions at the end of a product's life and improve circularity outcomes (Legardeur & Ospital, 2024).

Moving to a circular economy has significant socio-economic benefits. Research indicates that cloth recycling mitigates economic losses resulting from overproduction and a disposable culture (Shirvanimoghaddam et al., 2020). Furthermore, companies that initiated take-back programs and sell used clothing have reported greater customer involvement and profitability (Seo & Jin, 2024). Financial obstacles, such as high processing costs and consumers' reluctance to pay a premium for recycled materials, however, remain a problem (Chen et al., 2021; Ponnambalam et al., 2023). Working with supply chain partners and giving consumers incentives to get involved while lowering financial barriers can help solve these problems.

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Trends in cloth recycling are significantly influenced by macroeconomic and policy-related factors, alongside business profitability. Economic instruments such as extended producer responsibility (EPR) schemes shift economic incentives toward producers for the post-consumer management of textiles, contributing to increased separate collection and improved sorting outcomes that are essential precursors to economically viable recycling systems (Brown & Börkey, 2024). Simultaneously, economies of scale and technological developments can reduce unit processing costs over time, increasing recycled fibres' competitiveness relative to virgin materials, particularly during periods of volatile raw material prices (Dahlbo et al., 2017). On the other hand, European policy analyses show that weak and unstable secondary raw materials markets with uncertain demand, quality variability, and limited market transparency can make it hard to plan investments in recycling infrastructure. This shows how important it is to have stable policy frameworks and long-term economic incentives to help recycled textile markets grow (European Commission, 2022; zu Castell-Rudenhausen et al., 2022).

Technology and economics form the structural backbone of recycling. AI-driven spectroscopy enhances fibre identification accuracy, reducing contamination in the recycling stream. However, these technological trends are directly limited by economic factors, such as high processing costs and the lack of Extended Producer Responsibility (EPR) frameworks in developing economies, which creates a barrier to widespread adoption.

The Human Pillar: Consumer Behaviour and Psychology

Researchers have increasingly examined consumer behaviour related to clothing recycling in response to growing concerns about textile waste (Paço et al., 2021; Pranta et al., 2024). The rise of fast fashion has substantially reshaped clothing consumption patterns, contributing to a sharp increase in textile waste (Niinimäki et al., 2020). Studies indicate that Generation Y consumers, who frequently purchase fast fashion, tend to dispose of clothing more often, driven by both financial considerations and charitable motivations (Hassan & Yee, 2014). Moreover, the rapid turnover of fashion trends has accelerated clothing disposal rates, a problem compounded by the limited durability of many garments (Pensupa, 2019). These dynamics highlight the urgent need to promote sustainable fashion practices and more responsible consumption to reduce textile waste.

Consumer behaviour toward recycled clothing is shaped by several factors, including product availability, perceived value for money, and levels of environmental awareness (Islam et al., 2021; Joung & Park-Poaps, 2013). Research conducted in Moldova and Australia underscores the importance of increasing consumer awareness of sustainable fashion consumption while also broadening the availability of recycled clothing options (Iordachi et al., 2024; Rotimi et al., 2024). The findings indicate that environmentally conscious consumers are more inclined to engage in textile recycling. Nevertheless, limited awareness of available recycling channels among the broader population continues to hinder widespread participation.

Clothing repair and disposal practices play a critical role in determining the overall effectiveness of recycling efforts. McNeill et al. (2020) report that while fashion consumers often dispose of garments rapidly, they are more likely to repair items that carry sentimental value or align closely with their personal style. Encouraging attitudes toward repair and upcycling can extend garment lifespans and substantially reduce textile waste (Kant Hvass, 2014). In this context, retailers and policymakers should consider implementing measures that

promote environmentally responsible consumption and support clothing repair practices (Pranta et al., 2025b).

Clothing recycling behaviour is influenced by factors such as convenience, limited recycling infrastructure, and low levels of consumer awareness (Bianchi & Birtwistle, 2012). Empirical studies by Han et al. (2024) and Laitala (2014) demonstrate that consumers' disposal choices are strongly shaped by their perceptions of recycling convenience, with many opting for landfilling due to the poor accessibility of recycling facilities. Addressing these barriers through improved recycling infrastructure, targeted awareness campaigns, and supportive policy interventions could significantly increase participation in clothing recycling programs (Pranta et al., 2025b).

In conclusion, consumer behaviour plays a central role in shaping clothing recycling trends. Despite increasing environmental awareness and growing interest in sustainable practices, convenience-driven disposal and fast fashion consumption continue to fuel textile waste. Addressing key constraints, including limited recycling infrastructure, insufficient consumer knowledge, and short garment lifespans, can substantially enhance participation in recycling initiatives. Future research should therefore focus on developing effective strategies to influence consumer perceptions and behaviours in support of a more sustainable and circular fashion industry.

Theoretical Integration: Applying the Theory of Planned Behaviour (TPB)

While the four pillars outlined above describe prevailing trends, the Theory of Planned Behaviour (TPB) explains the mechanisms through which these trends translate into recycling behaviour. Linking each pillar to the core TPB constructs shifts the analysis from a purely descriptive review toward a structured analytical framework:

- Attitude: Primarily driven by the Environmental Pillar. A consumer's personal conviction is formed by knowledge of CO2 and water pollution levels.
- Subjective Norms: Shaped by the Industrial Pillar. Global standards (GRS) and cultural traditions (Kantha) create the social pressure and "normalisation" of recycling.
- Perceived Behavioural Control (PBC): Controlled by the Technological and Economic Pillar. AI ease-of-use increases a consumer's "control" over recycling, while high costs and the lack of the EPR act as barriers that decrease this control.

Attitudes and Environmental Knowledge

Consumer attitudes toward cloth recycling are a primary determinant of their participation in circular fashion. These attitudes are significantly shaped by environmental knowledge and self-identity (Jalil & Shaharuddin, 2019; Rotimi et al., 2023). The fashion industry currently contributes approximately 8% of global carbon dioxide emissions and 20% of industrial water pollution (Wagaw & Babu, 2023). Life cycle assessment (LCA) studies indicate that fibre-to-fibre recycling can result in significant savings in greenhouse gas emissions and water consumption compared to virgin manufacturing (Roy et al., 2023).

The synthesis reveals that while increased environmental awareness generally fosters a positive attitude toward recycling, this is often complicated by internal psychological factors (Rotimi et al., 2023). For instance, "greediness" or a shopaholic mentality can diminish the influence of environmental knowledge, leading consumers to discard items without considering their

ecological footprint (Zeelenberg & Breugelmans, 2022). Conversely, emotional connections and "sentimental value" can drive positive behaviors such as repairing or repurposing clothing, suggesting that fostering emotional durability is a key strategy for improving consumer attitudes toward sustainability (McNeill et al., 2020).

Social Norms and Collective Influence

Subjective norms, the perceived social pressure to engage in a behaviour, play a critical role in bridging the "attitude-behaviour gap" in textile recycling (Park & Ha, 2014). The growing popularity of digital solutions, such as Online Clothing-Recycling Platforms (OCRPs), is heavily influenced by these social drivers (Zhang et al., 2020). While current regular usage of these platforms remains relatively low at approximately 10%, their adoption is largely dictated by social influence and the normalisation of digital recycling within a consumer's social circle (Han et al., 2024).

As sustainability gains momentum globally, the shift toward a circular economy is being standardised through international initiatives like the Global Recycled Standard (GRS) (Textile Exchange, n.d.). These frameworks not only provide technical standards but also shift collective social expectations regarding brand transparency and consumer accountability. By framing recycling as a collective standard rather than an isolated act, social norms can effectively convert individual intentions into sustained community participation.

Perceived Behavioural Control: Convenience and Infrastructure

Perceived Behavioural Control (PBC) refers to a consumer's perception of how easy or difficult it is to perform recycling actions (Park & Ha, 2014). The Scopus AI analysis identifies technological innovation and economic policy as the two most significant factors influencing PBC.

Technological Enablers: AI-enabled sorting systems utilising computer vision, spectroscopy, and machine learning drastically improve the accuracy and scalability of textile-to-textile recycling (Faghih et al, 2025). According to Legardeur and Ospital, (2024), by reducing contamination in the recycling stream, these technologies increase the availability of high-quality recycled products, thereby making it easier for consumers to choose sustainable alternatives. Furthermore, policy-driven digitisation like Digital Product Passports is expected to enhance PBC by providing consumers and recyclers with seamless access to a product's lifecycle data.

Economic and Structural Barriers: Despite technological progress, PBC is often hindered by high processing costs and a lack of local recycling infrastructure (Chen et al., 2021; Ponnambalam et al., 2023). Many consumers continue to discard clothing in landfills simply due to the ease of doing so compared to finding specialised recycling centres (Zhang et al., 2020). Economic instruments such as Extended Producer Responsibility (EPR) schemes are critical in shifting the financial burden away from the consumer and toward the producer (Brown & Börkey, 2024). Such policies, combined with economies of scale that lower the cost of recycled fibres, are essential for making recycling a convenient and economically viable "default" choice for the average consumer (Dahlbo et al., 2017).

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Table 1: Overview of Key Studies on Consumer Behavior in Cloth Recycling and Sustainable Fashion

Author	Title	Source Title	Citations
Laitala (2014)	Consumers' clothing disposal behavior - a synthesis of research results	International Journal of Consumer Studies	128
Paço et al. (2021)	Fostering sustainable consumer behavior regarding clothing: Assessing trends on purchases, recycling and disposal	Textile Research Journal	67
Zhang et al. (2020)	Consumers' clothing disposal behaviors in Nanjing, China	Journal of Cleaner Production	51
McNeill et al. (2020)	Fashion sensitive young consumers and fashion garment repair: Emotional connections to garments as a sustainability strategy	International Journal of Consumer Studies	46
Kumagai (2021)	Sustainable plastic clothing and brand luxury: a discussion of contradictory consumer behavior	Asia Pacific Journal of Marketing and Logistics	32
Jalil & Shaharuddin (2019)	Consumer purchase behavior of eco-fashion clothes as a trend to reduce clothing waste	International Journal of Innovative Technology and Exploring Engineering	27
Pensupa (2019)	Recycling end-of-life clothes	Sustainable Technologies for Fashion and Textiles	23
Shahid et al. (2024)	Prospects and challenges of recycling and reusing post-consumer garments: A review	Cleaner Engineering and Technology	14
Wagaw & Babu (2023)	Textile Waste Recycling: A Need for a Stringent Paradigm Shift	AATCC Journal of Research	11

Grillo-Méndez et al. (2022)	Citizen participation in circular economy systems for textile waste: an initial approach	CIRIEC-Espana Revista de Economia Publica, Social y Cooperativa	3
Patnaik & Tshifularo (2021)	Fashion brands approach toward waste management	Waste Management in the Fashion and Textile Industries	1
Han et al. (2024)	European Circular Economy Perspectives on Fashion and Textile Consumer Behaviour	Recycling and Lifetime Management in the Textile and Fashion Sector	0
Iordachi et al. (2024)	Consumer decision drivers in the republic of moldova: choosing recycled clothing for a sustainable future	Calitatea Vietii	0
Geldhauser et al. (2024)	The future of automated sorting of used textiles	Melliand International	0
Ben Amor et al. (2024)	Opportunities and Challenges for the Sorting of Post-consumer Textile Waste	Lecture Notes in Civil Engineering	0

This list shows some important academic research on consumer action related to recycling clothes and being environmentally friendly. These studies were published in peer-reviewed journals and conference proceedings between 2014 and 2024. The search query identified 13 documents. Inclusion criteria were: (1) Peer-reviewed articles and conference papers; (2) Published between 2014 and 2024; (3) Focused on post-consumer textile waste. Exclusion criteria included non-English publications and papers solely focused on industrial waste without consumer interaction. To ensure reliability, the AI-generated summaries were cross-checked against the original abstracts of the top-most-cited papers in Table 1.

- Highly cited papers: The most referenced paper with 128 citations is Laitala (2014), which summarises existing research on consumer clothing disposal behaviour. Another highly referenced publications include Paço et al. (2021) with 67 citations and Zhang et al. (2020) with 51 citations, which examine trends in sustainable garment consumption, recycling, and disposal.
- New Contributions (year 2024): Shahid et al. (2024) and Han et al. (2024) have published two new papers discussing the most recent parts of the circular economy and the problems with reusing clothes. Another new studies, by Ben Amor et al. (2024) and Geldhauser

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et al. (2024), explore the future of automatic sorting and managing unwanted textile waste, but it has not yet been cited.

- Geographical and Thematic Diversity: Research investigates multiple aspects of clothing sustainability, such as consumer perceptions (Iordachi et al., 2024), brands' waste management strategies (Patnaik & Tshifularo, 2021), and the impact of technology on recycling (Pensupa, 2019).

This set reflects an increasing scholarly interest in sustainable fashion consumer behaviour, with a focus on recycling, circular economy ideas, and waste management technological advancements.

Concept Map

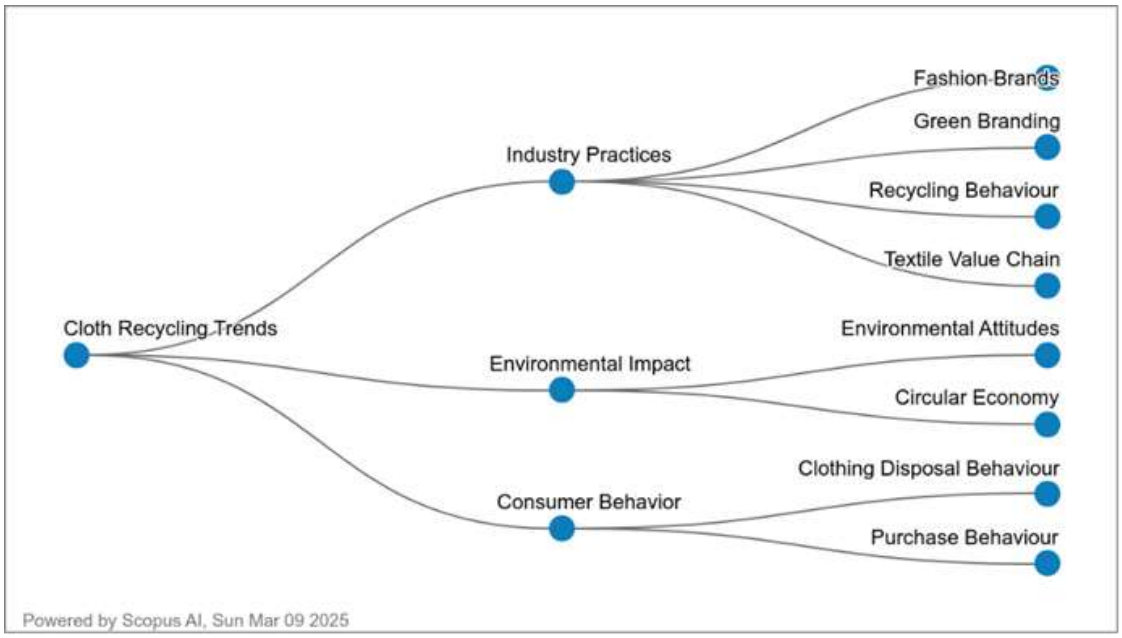

Figure 2: Concept Map of Cloth Recycling Trends Synthesized via Scopus AI

Synthesis and Theoretical Interpretation of the Concept Map

Figure 2 illustrates a Concept Map synthesised through the Scopus AI trial. To ensure theoretical rigour as suggested by the literature, a clear distinction is made between the visual data and the analytical structure: the Concept Map serves as the visual tool used to organise the multi-dimensional ideas identified by Scopus AI, whereas the Conceptual Framework provides the theoretical explanation of how these ideas interact.

The framework operates through the following key components and causal pathways:

- Construct Components: The map identifies four macro-environmental drivers—Environmental Impact, Technological Innovation, Economic Factors, and Policy Instruments. In this framework, these are treated as external antecedents that influence the psychological variables of the Theory of Planned Behaviour (TPB).
- Justification for Causal Pathways: The framework assumes a top-down causal relationship. Technological Innovation (e.g., AI-enabled sorting) and Policy Instruments (e.g., EPR schemes) are hypothesised to directly influence a consumer's Perceived Behavioural Control (PBC). By automating sorting and providing

standardised recycling protocols, these external factors reduce the 'transaction cost' and physical effort for the individual, thereby increasing the likelihood that a positive recycling Intention will translate into Behaviour.

- Alignment with Evidence: This framework is validated by the reviewed literature, which highlights that while environmental knowledge shapes Attitudes, it is the technological and economic infrastructure that dictates actual participation. The framework thus explains the 'intention-behaviour gap' by positioning technology and policy as the critical bridges that move a consumer from awareness to action.

Topic Expert

Researchers such as Ahmed Mezheri, Abdelaziz Lallam, and Meriem Benzarti have an advanced understanding of environmentally friendly material development within the textile industry. Their work emphasises sustainable innovations, particularly the creation of low-impact binders, which play a critical role in shaping recycling processes and driving consumer demand for greener products. These contributions underscore the importance of materials that align with consumers' increasing preference for eco-friendly alternatives as the fashion industry transitions toward more sustainable production models. Garments made from environmentally responsible materials can improve recyclability and encourage greater consumer acceptance of recycled clothing (Mezheri et al., 2024).

Abdelaziz Lallam has made substantial contributions to the development of sustainable textile binders. He has a solid research record and a high citation impact. His research focuses on lowering the overall ecological footprint of textile production by examining both the technical and environmental aspects of creating new materials. Textiles can be made more durable and recyclable by using chemical grafting techniques and sustainable polymers. Additionally, this strategy is in line with consumers' increasing inclinations toward sustainable products (Mezheri et al., 2024).

The growing demand for sustainable material innovation is bolstered by Meriem Benzarti's research on environmentally friendly binders. Her research focuses on ways to lessen the impact on the environment while maintaining textile quality, which is crucial in influencing consumers' perceptions of recycled apparel. Improvements in green binders can help make sustainable fashion more appealing because many consumers are reluctant to purchase recycled textiles due to concerns about quality and durability. Additionally, studies indicate that consumers are more inclined to engage in circular economy practices when they are more aware of and have easier access to high-quality recycled textiles (Mezheri et al., 2024).

Even though Ahmed Mezheri is still in the early stages of his research career, his work makes a significant contribution to the expanding effort to make textiles more sustainable. His creation of eco-friendly binders is a crucial first step toward further advancements in textile recycling. By addressing issues with cost, supply constraints, and consumer reluctance, the use of these materials in industry may contribute to a rise in the use of recycled garments. Additionally, by increasing productivity and lowering contamination in textile waste streams, green binders may facilitate automated recycling procedures (Mezheri et al., 2024).

Overall, these researchers' work contributes significantly to the advancement of sustainable textile development, particularly by demonstrating how novel materials can facilitate circular economy practices. When used in textile recycling, eco-friendly binders have the potential to

change consumer perceptions, promote the use of recycled goods, and offer significant environmental advantages. In order to ensure that the textile industry can effectively reduce textile waste while meeting the growing consumer demand for sustainability, future research should concentrate on how these materials can be scaled up for wider industrial use.

Emerging Theme

Rapid industrial and technological advancements in cloth recycling have been a consistent theme in recent research, which reflects a growing emphasis on increasing sustainability and efficiency. Automated sorting systems, AI-based technologies, and sustainable design approaches such as mono-material garments have reduced contamination and made it easier to process cloth waste (Sandin & Peters, 2018; Shahid et al., 2024; Wagaw & Babu, 2023). These innovations strengthen the idea that better design and automation can make recycling much more effective and have less of an effect on the environment.

Cloth recycling also heavily depends on consumer behaviour and environmental consciousness. Research indicates that consumers' inclination to purchase recycled clothing is increased by perceived value, ecological concern, and successful marketing techniques like green labelling (Iordachi et al., 2024; Rotimi et al., 2024; McNeill et al., 2020). This implies that encouraging recycled clothing requires both strategic communication and consumer motivation.

The significance of consumer education and policy initiatives is further highlighted by research. Circular fashion systems can be supported, and recycling habits strengthened by educating the public about the advantages of recycling and putting laws like extended producer responsibility (EPR) into place (Han et al., 2024; Moazzem et al., 2021). These initiatives highlight the necessity of well-informed consumers and robust regulatory frameworks.

Products made from recycled materials, particularly post-consumer waste, are becoming more and more popular. It has been demonstrated that public policies and marketing that emphasise innovation and environmental benefits increase consumer adoption of recycled products (Mezheri et al., 2024).

Overall, results demonstrate how policy action, consumer behaviour, circular economy concepts, and technological innovation all contribute to the advancement of textile recycling. In order to promote sustainable practices in the fashion industry, future research should keep investigating novel technologies and behavioural tactics.

Conclusion

This study provides a data-driven synthesis of global cloth recycling research through a consumer behaviour lens, using Scopus AI to integrate environmental, industrial, technological-economic, and human dimensions within a unified analytical framework. By moving beyond fragmented technical or psychological analyses, the review demonstrates that cloth recycling functions as a socio-technical system in which consumer participation is the critical dependency. Environmental awareness alone is insufficient to drive sustained recycling behaviour; instead, participation emerges from the interaction between consumer attitudes, social norms, and perceived behavioural control.

The integration of the Theory of Planned Behaviour clarifies the mechanisms underlying the persistent attitude–behaviour gap identified across the literature. Environmental knowledge strengthens positive attitudes toward recycling, while industrial standards and cultural practices contribute to the normalisation of circular behaviours through subjective norms. However, the findings consistently show that perceived behavioural control represents the strongest constraint. Technological innovations such as AI-enabled sorting, digital product passports, and automated collection systems have the potential to reduce effort and uncertainty, yet their effectiveness is structurally limited by high capital costs, fragmented infrastructure, and the absence of stable policy instruments, particularly Extended Producer Responsibility frameworks in developing economies.

The synthesis highlights that meaningful progress in textile circularity requires shifting cloth recycling from a voluntary, effort-intensive action to a convenient default option embedded within everyday consumption systems. Policy interventions, technological automation, and economic incentives must therefore be designed not as isolated solutions, but as coordinated levers that reshape consumer choice architecture. When recycling is accessible, normalised, and economically supported, intention is more likely to translate into action.

Methodologically, this study demonstrates the value of AI-assisted systematic reviews for sustainability research. Scopus AI enabled the rapid identification of latent connections between technological advances and consumer psychology that are often treated separately in traditional reviews. This approach strengthens theoretical integration and offers a scalable model for future interdisciplinary literature synthesis.

From a practical perspective, the findings offer clear implications for policymakers, industry stakeholders, and researchers. Policymakers should prioritise stable regulatory frameworks, particularly EPR schemes, to support investment in recycling infrastructure. Industry actors should align product design, take-back systems, and digital traceability with consumer convenience and trust. Researchers are encouraged to empirically test the proposed conceptual framework across different socio-economic contexts and to further investigate how technological defaults influence long-term behavioural change.

Overall, enhancing textile circularity depends not only on improving recycling technologies but also on aligning macro-level systems with micro-level consumer behaviour. By positioning technology and policy as enablers of perceived behavioural control, this study contributes a theoretically grounded and actionable perspective for advancing sustainable fashion and clothing recycling systems.

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