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Theoretical framework of the textile industry's reverse supply chain

Framework teórico da cadeia de suprimentos reversa da indústria têxtil

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ABSTRACT

Population growth has increased consumption rates to levels that threaten the availability of natural resources, affecting all sectors—including the textile industry, which accounts for approximately 80 billion new clothing items consumed globally each year and a production volume of 100 billion garments annually, of which 33% are discarded within the first year of purchase. In Brazil, textile waste generation amounts to approximately 170 thousand tons per year, drawing significant attention to the waste produced by this industry. Thus, this study maps the literature on the stakeholders involved in the textile industry's reverse supply chain (RSC) and identifies sustainable practices that strengthen this process. The aim is to propose a framework that represents this part of the textile supply chain. The analysis identified and categorized 82 stakeholders into 24 categories, 16 of which focused on RSC, highlighting their roles, interrelationships, and impacts on RSC effectiveness. The research also identified 97 RSC additional components, mostly focused on recycling materials and manufacturing new products. The results indicate that collaboration among stakeholders is essential to boost the circular economy (CE) in the sector, although challenges such as a lack of financial incentives, inadequate regulation, and low consumer awareness still hinder the expansion of this system. The main contributions include structuring RSC, identifying stakeholders, and providing a framework based on the state of the art. The study reinforces the importance of developing public and business policies to consolidate a more sustainable textile sector.

Keywords: circular economy; circular supply chain; stakeholders; waste management; textile waste.

RESUMO

O crescimento populacional eleva as taxas de consumo a níveis que ameaçam os recursos disponíveis, impactando todos os setores, inclusive a indústria têxtil, que proporciona um consumo global de vestuário aproximado de 80 bilhões de novas peças anualmente e uma produção de 100 bilhões de peças por ano, das quais 33% são descartadas no primeiro ano de aquisição. No Brasil, a geração de resíduos têxteis corresponde a aproximadamente 170 mil toneladas anuais, atraindo atenção para os resíduos gerados nesta indústria. Assim, este estudo mapeia a literatura referente aos *stakeholders* envolvidos na cadeia de suprimentos reversa (RSC) da indústria têxtil e identifica práticas sustentáveis que fortalecem esse processo. O objetivo é propor um *framework* que represente essa parte da cadeia de suprimentos têxtil. A análise identificou e categorizou 82 *stakeholders* em 24 categorias, sendo 16 voltados para a RSC, destacando suas funções, interrelações e impactos na efetividade da RSC. A pesquisa também identificou 97 componentes adicionais, majoritariamente voltados à reciclagem de materiais e fabricação de novos produtos. Os resultados demonstram que a colaboração entre *stakeholders* é essencial para impulsionar a economia circular (CE) no setor, embora desafios como falta de incentivos financeiros, regulamentação inadequada e baixa conscientização dos consumidores ainda dificultem a expansão desse sistema. As principais contribuições incluem a estruturação da RSC, a identificação dos *stakeholders* e a disponibilização de um *framework* baseado no estado da arte. O estudo reforça a importância do desenvolvimento de políticas públicas e empresariais para a consolidação de um setor têxtil mais sustentável.

Palavras-chave: economia circular; cadeia de suprimentos circular; partes interessadas; gerenciamento de resíduos; resíduos têxteis.

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Introduction

Population growth increases consumption to levels that threaten available resources (Dursun et al., 2023). This increase is notable in the textile industry, which is a major market and employment sector. Eighty million new garments are consumed every year (Inside Waste, 2020). However, the growth paradigms of this industry are being questioned (Milan et al., 2010).

The global fashion industry produces approximately 100 billion garments annually, with 33% discarded within the first year of use (Monash University, 2021). As noted by Menegucci et al. (2015), the textile sector is a significant source of waste derived from plant-based, animal-based, and synthetic materials. Accounting for 5% of global waste in 2017, it has recently been classified as the second most polluting, generating 92 million tons of waste per year, with a projection of 140 million by 2030 (Fischer and Pascucci, 2017; Luz, 2022). Waste or clothing discarded due to loss of usefulness (Stanescu, 2021) represents an environmental challenge.

Thus, adapting the textile industry to sustainable standards is essential, and the concepts of sustainability, sustainable development (SD) and circular economy (CE) stand out. SD proposes managerial and social approaches to environmental protection (Milan et al., 2010; Nobre et al., 2022), while CE seeks to keep materials in circulation through reuse, refurbishment, and recycling, mitigating global challenges (Ellen MacArthur Foundation, 2013). The demand for sustainable practices and technological innovation is driving the transition to circular production models. This change needs to involve the entire supply chain (SC), although the importance of relationships is little recognized (Jena and Sarmah, 2014). Both in their day-to-day relationships and in the transition to sustainable models, it requires strategic interactions to promote circularity—especially in emerging economies, where market volatility makes the transition difficult (Lin et al., 2023).

A circular supply chain (CSC) combines forward (FSC) and reverse (RSC) supply chains to maximize material recovery. A valuable basis for implementing CSC and more sustainable chains is the closed-loop model (Kayikci et al., 2022). This system requires a focal company to coordinate direct and reverse flows, closing material loops (Farooque et al., 2019; Berlin et al., 2022). Unlike linear chains, which follow the "extract-produce-consume-discard" model, the circular chains model prioritizes reuse, remanufacturing and recycling (Koszewska, 2018; Mangla et al., 2018).

In Brazil, the textile industry plays an important economic role. In 2020, it was the second largest employer in the manufacturing industry, with 1.36 million direct workers and 8 million indirect workers, 60% of whom were women (ABIT, 2018). In 2022, national production reached 2.1 million tons, placing Brazil among the top four global producers (ABIT, 2024). However, in 2018 only 20% of discarded textile waste was properly disposed of, an alarming figure for a country that discards 4 million tons of this waste every year (Amaral et al., 2018; Abrelpe, 2022).

The implementation of RSC in the Brazilian textile industry is important in order to reintegrate waste into the production cycle. This model requires a systemic approach, considering the life cycle of products and efficient waste management, reinforcing its competitive importance (Das and Posinasetti, 2015; Elia and Gnoni, 2015).

Thus, this study aimed to propose a theoretical framework representing the components of RSCs—including stakeholders, flows, activities, operational or strategic practices, enabling strategies, technologies, and circularity-related concepts, principles, and guidelines that influence the operations—involved in the textile industry. A framework that represents this dynamic can provide a systemic perspective for decision-makers, facilitating and enabling the implementation of more circular textile SC.

Methodology

In order to achieve the objective, this research considered stakeholders and additional components in reverse logistics (RL), recovery and final disposal processes, as well as the flows associated with circularity and sustainability in the textile industry. To this end, a systematic literature review (SLR) considered a survey and detailed analysis of the literature on RSC in the textile industry. This review considered the stages proposed by Tranfield et al. (2003), namely: pilot review, creation of the review protocol, obtaining and selecting articles, data extraction, and presentation and analysis of the results. The following text provides a detailed description of each stage.

The pilot review sought to test the adherence of potential keywords and search terms to the central theme of the research. The objectives were to define the search string that would maximize the identification of relevant articles, select a representative set of studies to be analyzed, and ensure adherence of the research proposal to the existing literature. The review protocol defined the parameters that guided the systematization of the review, allowing for full replicability. In addition to the information defined in the pilot review, the protocol included: types of documents analyzed, languages considered, research questions (RQ) along with their respective objectives, and inclusion and exclusion criteria. Table 1 provides the pilot review protocol.

The surveyed publications were compiled in a spreadsheet and analyzed, excluding duplicates and inaccessible articles. We screened the titles, abstracts, and keywords of the remaining articles, applying inclusion and exclusion criteria outlined in the review protocol.

In the data extraction stage, we also read the remaining articles in their entirety, considering the inclusion and exclusion criteria. In addition, we only selected articles directly related to the study's objectives.

Based on the answers derived from the RQs, we identified the components involved, along with the reverse flows—such as origins, destinations, and material types—proposed in the literature for RSC in the textile industry, considering the RL framework proposed in Melo et al.

(2022). A theoretical framework and a portfolio of components aimed at circularity in the textile industry were proposed. The focus of the study was on the clothing fraction and the post-consumer reverse cycle.

Results and Discussion

The SLR resulted in 206 articles. These were identified and organized in a spreadsheet, where duplicate articles were removed, resulting in 146 articles. Of these, 35 articles were excluded due to inaccessibility, resulting in 111 titles for screening in the subsequent stage. Subsequently, reading the titles and abstracts led to the application of the inclusion and exclusion criteria (Table 1), eliminating a further 39 articles. The eligibility process resulted in 72 publications addressed to the central topics of this research.

The final sample covers the period from 2017 to 2026. There has been a progressive growth in publications on the subject. Table 2 brings the stakeholders identified in the literature. We grouped these stakeholders by similarity into 24 distinct categories, totaling 82 agents based on their roles and classifications within the CSC. This categorization aimed to optimize the organization of the data and facilitate visualization of the RSC. The category structure aligns with the value-added flow of the textile CSC, which still begins in the FSC with consumers, directly involved in product use. It then introduces RSC stakeholders engaged in reuse, recovery, and disposal activities, along with indirect stakeholders who, although not part of the physical material flow, influence CSC dynamics. The structure concludes with other FSC stakeholders who use recovered materials to manufacture new products, thereby completing the CSC loop. Table 2 shows stakeholders organized according to the flow of materials in the RSC, categories, stakeholders, references, and frequency of occurrences in the SLR.

The literature identifies several stakeholders in textile RSC. This post-consumer RSC (research focus) begins with a disposal, so the analyzed RSC begins with the consumer stakeholder category, the last stakeholder in the FSC, and the first in the RSC. This stakeholder determines the end of the useful life of textiles by deciding when, how and where to dispose of them (Pera and Ferrulli, 2024). Their decisions can lead to reuse, repair, donation or resale, motivated by damage or psychological obsolescence (Pera and Ferrulli, 2024), directly influencing the adoption of the CE model (Lehner et al., 2020). They influence RSC through habits, content and collaborative initiatives, capable of mobilizing society on a larger scale (Yadav and Majumdar, 2024), generating changes in consumption and production patterns, strengthening RSC, and pressuring production systems.

To make this transition, consumers must adopt practices to reduce consumption, prolong the use of parts and take proper care of products (Patwary et al., 2023). It is also necessary to encourage the proper separation of waste and scrap, initiating the reverse cycle and promoting circularity. Consumers forward materials, products and waste for redistribution or recovery, interacting with five categories: repairers, reusers, collection points, collectors and non-governmental

Table 1 – Pilot Review Protocol.

Objective	Propose a theoretical framework representing stakeholders, additional components and flows involved in RSC in the textile industry	
Databases	Web of Science (WoS) and Scopus	
String	("Reverse Supply Chain" OR "Reverse Logistic" OR "Circular Economy" OR "Circular Supply Chain" OR "Waste Management" OR "Closed Loop Supply Chain") (Search within: Title, Abstract, Keywords) AND Stakeholders (Search within: Title, Abstract, Keywords) AND ("Textile Industry" OR "Textile Waste") (Search within: Title, Abstract, Keywords)	
Types of documents	Research articles, Conference articles, and Review articles.	
Language	English	
Research Period	Up to February 2026	
Inclusion Criteria	- Studies containing information on stakeholders; additional components, and flows in RSC - Studies containing information on textile waste in RSC, CE, CSC or RL	
Exclusion Criteria	- No relation to the terms of the research string or theme - Supply chains that do not have a circular or reverse bias	
Search parameters	Authors; Titles; Year; Country; Stakeholders; additional components involved in reverse logistics, recovery, and final disposal; and RSC flows in the textile industry	
RQ1	Which stakeholders are involved in RSC in the textile industry?	**Objective:** Identify stakeholders mentioned in the literature on textile industry's RSC.
RQ2	What are the RSC flows considered in the textile industry, according to the literature?	**Objective:** Characterize flows (i.e. origins, destinations, types of materials, and information) considered in RSC in the textile industry, according to the literature.
RQ3	What additional components developed in the textile industry RSC or additional components developed in the FSC stimulate the structuring of a textile RSC?	**Objective:** Identify additional components developed in the textile industry RSC or practiced in the FSC, which stimulate RSC in some way, mentioned in the literature.

Table 2 – Categories of stakeholders identified in the survey.

Category	SC	Stakeholders	%
Consumers	**FSC/ RSC**	Consumer[24; 35; 4; 30; 23; 3; 20; 2; 11; 19; 27; 25; 18; 32; 17; 15; 28; 31; 1; 7; 14; 33; 29; 8; 16; 6; 21; 13; 5; 34; 37; 42; 43; 44; 45; 47; 48; 49; 50; 51; 54; 55; 56; 58; 60; 61; 62; 64; 65; 68; 69; 70; 72]; Customer[4; 23; 21; 25; 9; 17; 22; 26; 52]; Society[35; 13; 27]; Community[35; 13; 52; 60; 66; 71]; Media[13; 27; 51; 56	83.3
Repairers	**RSC**	Repair services[22; 24; 11; 19; 31; 7; 33; 13; 48]; Seamstress[13]	12.5
Reusers	**RSC**	Resale sites[24; 38]; Flea markets[24; 20; 12; 32; 31; 16; 34; 21]; Second-hand clothes stores[23; 22; 20; 11; 12; 25; 32; 28; 31; 7; 16; 21; 5; 38	30.6
		Rental companies[7; 13]; Rental platforms[22; 12; 31; 16]; Clothing library[31; 12	
		Charities[31; 16; 27; 5; 24; 11; 12; 19; 1; 7; 34; 20; 21]; Charitable associations/organizations[31; 20; 5; 24; 27; 13; 35; 38; 46]; Commercial clothing reuse companies[31]	
Collection points	**RSC**	Collection points [11]	1.4
Collectors	**RSC**	Collection companies[14]; Collectors[5; 14; 18; 20; 32; 17; 38; 59]; Waste pickers[33; 13; 63]; Waste picker cooperatives[33; 13; 28]; Collection centers[10; 31]	19.4
Logistics operator/ Transporter	**RSC**	Waste exporters[5]	2.8
Processors	**RSC**	Separator cooperative[11; 13]; Separator[11; 10]; Sorting companies[11; 10; 28; 36]; Scavengers[13; 28; 33]	8.3
NGOs	**RSC**	NGOs[11; 15; 22; 31; 7; 8; 26; 36; 42; 46; 55; 56; 59; 62; 69; 70]; Social enterprises[19; 28; 31; 38; 69]; Sustainable organizations[24; 35; 27; 13; 38]; Multilateral organizations (ITC; UNIDO; OIT)[36]; Certifying bodies[44]; Regulatory bodies[61]; Activists[27; 51]	36.1
Waste managers	**RSC**	Waste management companies[19; 27; 26; 9; 7; 32; 50; 67]; Waste vendors[20; 28; 9; 47	15.3
Remanufacturers	**RSC**	Upcyclings[20; 27; 28; 6]; Entrepreneurs[27]; Reuse companies[31]; Upcycling companies [27]; Designer[30; 20; 11; 19; 27; 18; 17; 15; 28; 7; 14; 34; 49; 53; 56; 72	26.4
		Remanufacturing services [19]	
Recyclers	**RSC**	Recyclers[3; 20; 11; 19; 27; 18; 32; 17; 28; 29; 36; 37;40; 41; 47; 48; 59; 61; 53; 59]; Recycling organizations[5; 19; 37]; Recycling companies[18; 19; 27; 15; 38	30.6
Other FSC	**FSC**	Brick industry[28; 32]; Cement industry[28; 32]	2.8
Landfill/Incinerator Operators	**RSC**	Landfill[4; 23; 5; 19; 25; 10; 32; 17; 28; 31; 1; 33; 29; 8; 16; 6; 13; 21; 50]; Incinerators[23; 5; 32; 28; 29; 8; 16; 50	26.4
Government	**FSC/ RSC**	Government/ Authorities[35; 20; 11; 19; 27; 18; 9; 17; 15; 28; 22; 31; 7; 33; 8; 16; 13; 26; 37; 39; 42; 47; 51; 52; 54; 59; 60; 65; 66; 67; 68; 69; 70; 71]; Policymakers[8; 24; 30; 23; 11; 19; 12; 18; 32; 1; 36; 41; 43; 46; 47; 49; 50; 53; 56; 58; 60; 62; 63; 64	73.6
Labor Union	**FSC**	Labor unions [15]	1.4
Academy	**FSC/ RSC**	Research institutions/Academy[35; 30; 20; 19; 12; 27; 1; 13; 26; 37; 39; 41; 43; 45; 48; 54; 58; 59; 60; 64; 66; 71]; International industry and research consortia[28]; Technology developers[20; 17; 63	34.7
Creditors	**FSC/ RSC**	Investors[30]; Financial institutions [13]	2.8
Farmers	**FSC**	Producers [20; 15; 5; 44; 48]; Farmers [20; 15; 44; 45	8.3
Suppliers	**FSC**	Suppliers[4; 30; 3; 20; 11; 27; 25; 18; 9; 17; 15; 35; 7; 14; 13; 26; 42; 48; 52; 54; 60; 62	31.9
Producers/ Manufacturers	**FSC**	Designers[30; 20; 11; 19; 27; 18; 17; 15; 28; 7; 14; 34; 21; 31; 41; 43; 49; 53; 56; 72	56.9
		Buyers (sustainable or recycled materials)[15; 41	
		Textile industry[35; 20; 19; 10; 9; 7; 34; 60; 66]; Manufacturers[4; 30; 11; 19; 27; 25; 15; 28; 22; 7; 16; 37; 39; 40; 41; 43; 49; 51; 54; 55; 60; 61; 68; 72]; Yarn manufacturers[11; 17; 44; 54]; Fabric manufacturers[11; 18; 17; 44]; Clothing manufacturers[18; 17; 28; 44; 51; 64]; Producer[4; 11;19; 25; 15; 28; 7; 16; 18; 9; 32; 2; 12; 8; 53; 56; 72]; Textile companies[30; 11; 19; 18; 9; 12; 33]; Fashion companies[25; 19; 33; 8]; Brands[30; 11; 19; 15; 22; 16; 5; 34; 2; 12; 14; 33; 8; 56; 69	
		Resource managers[30]; Materials specialist[30]; Sustainability manager or head[8; 54	
Other manufacturers	**FSC**	Automotive industry[28]; Upholstery industry[28]	1.4
Logistics Operators	**FSC**	Logistics partners[68]; Logistics providers[11; 25]; Distribuitors[21; 11; 25]; Conveyor[1; 10; 11; 25	6.9
Wholesalers	**FSC**	Wholesalers[25; 13]; Brands[14; 13; 7	4.2
Retailers	**FSC**	Textile companies[22; 17; 24; 23; 20; 2; 31; 14; 8]; Fashion companies[11; 28; 5; 24]; Retailers [30; 11; 19; 27; 25; 18; 17; 28; 1; 7; 14; 33; 6; 13; 34; 36; 39; 42; 44; 49; 56; 59; 62; 63; 68]; Brands[21; 5; 18; 17; 35; 7; 13; 23; 9; 39; 42; 43; 45; 47; 56; 59; 60; 62; 63; 65; 68; 69; 70	62.5

*References codes: 1 – Abdallah et al. (2024); 2 – Abdelmeguid et al. (2024); 3 – Adenle et al. (2024); 4 – Ashby (2018); 5 – Boschmeier et al. (2024); 6 – Choudhury et al. (2024); 7 – Degenstein et al. (2023); 8 – Dhiwar and Bedarkar (2024); 9 – Dursun et al. (2023); 10 – Edirisinghe et al. (2024); 11 – Ermini et al. (2024); 12 – Ghoreishi et al. (2022); 13 – Gomes et al. (2023); 14 – Han et al. (2017); 15 – Härri and Levänen (2024); 16 – Juanga-Labayen et al. (2022); 17 – Kayikci et al. (2022); 18 – Kazancoglu et al. (2022); 19 – Khan et al. (2023); 20 – Kim and Wu (2021); 21 – Moazzem et al. (2022); 22 – Oliveira Neto et al. (2024); 23 – Patwary et al. (2023); 24 – Pera and Ferrulli (2024); 25 – Ranjan et al. (2024); 26 – Rumanti et al. (2021); 27 – Singh et al. (2019); 28 – Sinha et al. (2022); 29 – Solis et al. (2024); 30 – Staicu and Pop (2018); 31 – Staicu (2019); 32 – Tang (2023); 33 – Teixeira et al. (2023); 34 – Vehmas et al. (2018); 35 – Yadav and Majumdar (2024); 36 – Pal et al. (2025); 37 – Sharma et al. (2025); 38 – Brandner et al. (2025); 39 – Nguyen et al. (2025); 40 – S. B. Madumali et al. (2025); 41 – S. Madumali et al. (2025); 42 – Bussolo et al. (2026); 43 – Rahaman and Khan (2025); 44 – Abreu et al. (2025); 45 – Basile et al. (2025); 46 – Dehghannejad et al. (2025); 47 – Raman et al. (2025); 48 – Carvalho et al. (2025); 49 – O'Nascimento et al. (2026); 50 – Khan et al. (2025); 51 – Bukhantsova et al. (2024); 52 – Gök et al. (2025); 53 – Angelova (2025); 54 – Civera et al. (2025); 55 – Behal et al. (2025); 56 – Shamsuzzaman et al. (2025b); 57 – Shamsuzzaman et al. (2025a); 58 – Hossain et al. (2025); 59 – Thomas et al. (2024); 60 – Kuo et al. (2025); 61 – Krüger et al. (2025); 62 – Parro-Ruiz et al. (2026); 63 – Riisgaard (2026); 64 – Abtew et al. (2025); 65 – Sadurya and Selvaranee (2025); 66 – Graciano et al. (2025); 67 – López et al. (2024); 68 – Biswas et al. (2026); 69 – Ajwani-Ramchandani et al. (2025); 70 – Herrador and Imanishi (2025); 71 – Manolchev et al. (2024); 72 – Florea-Burduja et al. (2025).

institutions (NGs). Donations go to NGs, while waste and refuse go to other stakeholders, contributing to extending the useful life of textiles.

Prolonged use emerges as an alternative to disposal, and repairers and reusers categories promote the reuse of textiles by donating, reselling, renting and repairing pieces, contributing to the circularity of these materials. Repairers carry out repairs and modifications to extend the use of garments. In Brazil, there are thousands of professionals dedicated to this activity, avoiding unnecessary disposal (Gomes et al., 2023). However, the linear economy model and the dynamics of fast fashion often overlook these stakeholders. Ermini et al. (2024) point out these services create a link between consumer and product. Thus, they can be added to brands or operate independently.

Reusers cover many activities, starting with the resale of clothes. It is important to understand that second-hand clothes do not compete with fast fashion on price, style and fit (Patwary et al., 2023). Donations, while not competing with new products, also extend the life of textiles, saving raw materials and reducing waste (Patwary et al., 2023). Humanitarian reasons or perceived obsolescence motivate this activity. Renting allows the use of fashionable clothes without purchasing them outright (Oliveira Neto et al., 2024), promoting shared consumption. The reuse of 100 cotton T-shirts can reduce up to 1.48 kg of CO2eq (Patwary et al., 2023), reinforcing its positive impact on sustainability. The flows established for these categories connect consumers, reusers and repairers, allowing recovered materials to return to the consumption cycle. These receive damaged products (waste and reject flow), repair or modify them and reintegrate them into the market (recovered material flow).

When sharing or prolonged use is not feasible, consumers discard textile materials, often without due care. At this stage, collection points and collectors receive and forward waste for processing (Kayikci et al., 2022). Textile waste is collected, separated by type and recovery potential, stored and sent to reclaimers. Separation can take place before, during or after collection, with collectors transporting waste from collection points to processing centers, such as separators and sorting companies. In emerging economies, waste pickers (individual or organized) also perform this function.

Ecodesign, consumer education and return initiatives strengthen the transition to CE (Ermini et al., 2024). In Brazil, there are initiatives such as *Movimento Reciclo*, *EcoEstilo*, *Banco de Tecidos*, *Recicla Jeans*, *Meias do Bem* and *Retalhar* (Aparas Liberdade, 2024) that help to structure the textile RSC.

At this stage of the RSC, consumers discard waste and refuse at collection points, where collectors centralize and forward these materials to processors and logistics operators/transporters. The last stakeholders carry out waste traffic between countries. The export of textile waste is common in developed countries (Boschmeier et al., 2024), but even though it contains large quantities of recyclable materials, it includes items that do not meet the standards of foreign suppliers (Khan et al., 2023), often being discarded, causing pollution in the destination countries. These stakeholders receive the input stream (waste and refuse) and send an output stream as separated or recovered waste or just disposed of as refuse in the destination country.

Processors receive and sort collected waste by color and composition, and remove accessories such as staples and zippers (Kazancoglu et al., 2022). In Brazil, according to the National Movement of Waste Pickers, this category accounts for 90% of the selective collection of recyclables (Teixeira et al., 2023). They provide essential information for identifying reusable, remanufacturable or recyclable materials, making them key players in textile RSC. The sorting process generates two flows: refuse, destined for final disposal, and waste, sent to reclaimers and other industries, enabling many forms of recovery.

Waste managers oversee and manage the RL, recovery and disposal stages, including the post-treatment of disposal areas (Dursun et al., 2023). The stakeholders' flows are informational, essential for optimizing the aforementioned processes. Remanufacturers reprocess discarded parts, transforming them into new products or modifying them for sale. Their input flows are waste and their output flows are recovered materials, reinserted into the market. Recyclers reinsert textile waste into the production cycle, either as a secondary or primary input. Although proper disposal is still predominant, available methods include chemical, mechanical, biological and thermal processes. However, recycling faces technical, environmental and economic challenges, as well as requiring extensive use of energy. In several countries, textile waste fills landfills and emits greenhouse gas (Tang, 2023), wasting reusable materials. Recyclers' input flows consist of textile waste, while output flows include recyclables materials reinserted into the market or industry.

Landfill/Incinerator operators include landfills and incinerators. Ideally, this alternative should be restricted to irrecoverable materials, however restrictions on recycling, especially in developing countries, lead to excessive use of these options, compromising the circularity of materials. It is estimated that by 2050, more than 150 million tons of textile waste will be in landfills (Ellen MacArthur Foundation, 2017), an amount that could be recovered by more sustainable strategies. The input flows of this category are rejects, which should be disposed of properly.

Non-governmental organizations (NGOs) work on awareness campaigns, training and capacity-building initiatives, mentorship programs, and research on value chains, as well as supporting the transition toward green and circular practices. They also play a role in collecting and redistributing used clothing and promoting activism through social media (adapted from Yadav and Majumdar, 2024). With a strong humanitarian character, they help to mitigate social and environmental problems. These stakeholders contribute two flows: recovered materials, through donations that add value to the textile products, and informational flows, via campaigns that encourage society to engage in socioenvironmental causes.

There are also stakeholders who indirectly influence the RSC, whose actions contribute to improvement. The government category includes stakeholders responsible for legislating and establishing rules, resolu-

tions, inspections, incentives, obligations and sanctions to regulate the sector. They must propose initiatives to encourage recycling and separation of post-consumer textile waste (Abdallah et al., 2024). The academy category includes educational institutions, international industry and research consortia, and technology developers. Their role is to generate and disseminate knowledge and create technologies aimed at RSC. According to Khan et al. (2023), using state and national data is fundamental for planning and optimizing RSC, as well as for developing models and solutions. Creditors provide financial support for RSC, enabling it to operate. They direct economic resources, influencing key decisions (Gomes et al., 2023). Such contributions are essential for FSC stakeholders to promote innovations and improve their processes.

Indirect stakeholders have a broad influence on RSC. The government acts in the informational context—laws—and the financial context—incentives or taxes. Academy acts in the informational context through scientific production and technological innovation. Creditors influence the financial context by granting credit and financing. Considering all the stakeholders, the literature includes a wide variety of players, favoring the implementation of RSC. The stakeholders listed in Table 2 play a critical role in advancing the transition of textile RSC toward a more circular and sustainable economy. However, in many developing countries, these stakeholders often remain marginalized despite their essential contributions.

When evaluating the percentage of stakeholder mentions in the literature, there is a concentration of stakeholders related to manufacturing, retail, consumption and government (FSC stakeholders). These categories had a percentage of over 60%, denoting their potential responsibilities and influences on recovery processes. Consumers appear in 83.3% of the articles, underscoring their critical role in linking the FSC with the textile RSC. Reusers, remanufacturers, and landfill/incinerator operators also stand out as frequently mentioned stakeholders, appearing in 20 to 30% of the articles. Repairers, collectors, waste managers, recyclers, NGOs and academia, cited in 10 to 36%, and collection points, logistics operators/transporters, other FSC, unions and creditors, cited in less than 3% of the survey, reveal a research gap related to some textile RSC stakeholders.

This percentage variation in the literature may be due to the omission or lack of regulation regarding the attribution of RSC responsibilities (Alfaia et al., 2025; D'Ávila et al., 2025; Nogueira et al., 2025; Silva et al., 2025), low installed capacity regarding waste recovery infrastructure and technologies, especially in emerging countries, or low integration with other textile RSC stakeholders. The literature demonstrates the high level of operational complexity of RSC by identifying the actors involved directly and indirectly in their functioning.

This research also identified RSC-related additional components described in the literature. In all, we identified 97 additional components, including both RSC. Although applied upstream, FSC additional components can contribute to textile RSC performance (Nunes et al., 2023). Thus, we categorized these components based on their impacts on RL, recovery, and final disposal processes. According to the definitions presented in Ashby (2018), Martins et al. (2022), and Melo et al. (2022), we assumed that these categories of additional components are linked to textile RSC because they involve the return, processing, recovery or proper final disposal of materials at the end of their life cycle.

In addition, we created a fourth category of additional components, entitled "General", to include these components, which affect textile RSC performance, although they do not fall directly into the previous ones. Table 3 presents the defined categories of additional components along with their references.

The first category includes RL components of post-consumer textile waste. It involves the flow of materials and information among stakeholders, aimed at the recovery and final disposal of waste. Enabling these processes requires tracking, handling, and prior separation of the waste or product (gatekeeping) to ensure reintegration into the appropriate reverse cycle. Collection, transport and sorting are essential, as is consumer participation, since selective collection systems rely on source separation and return behavior (Vehmas et al., 2018). Lack of engagement in sustainable consumption and disposal practices leads consumers to discard unwanted clothing in dumpsters (Juanga-Labayen et al., 2022).

To reduce this risk, companies should provide convenient return options and encourage consumer participation through awareness, incentives, and supportive legislation (Degenstein et al., 2023). According to these authors, without measures that reflect environmental impacts in the price of products, scarcity of resources, strict legislation or the obligation to comply with extended producer responsibility, some stakeholders may not get involved and jeopardize circularity in the textile industry.

The recovery category includes components related to the reuse of textile waste through repair, refurbishment, remanufacturing and recycling, extending the life cycle of materials extracted from nature. These activities cover different stages of the production cycle and aim to reinsert recovered materials into new manufacturing, consumption or use processes. The literature highlights recycling additional components, and the production of new items from collected textile waste, justifying the need for an in-depth analysis of these methods.

Although textile recycling remains in its early stages, current technologies offer no assurance of meeting regulatory targets or clearly identifying which materials should take priority in the process (Solis et al., 2024). Recycling processes are constrained by the heterogeneous composition of fabrics, which integrate natural and synthetic fibers that are difficult to separate mechanically. This complexity increases as the waste moves up the production chain, making post-consumer recycling more challenging than pre-consumer recycling, which deals with homogeneous materials. Despite these challenges, recycling conserves natural resources and decreases the disposal in landfills (Moazzem et al., 2022).

Textile waste can be directly or after recovery reused—upcycling, for example, recovery discarded materials by transforming them into

Table 3 – Categories of additional components identified in the research.

Category	Additional components*	
	Industry	Post-consumption
Reverse Logistics	Collection drives[37]; Leadership commitment[39; 54; 62]; Relational approach with suppliers[4; 11; 14]; Cutting waste collection[15; 34; 5; 20	Source separation[1; 28; 39]; Post-consumer waste separation[1; 7; 34; 21
	Reverse logistics[4; 17; 33; 38; 39; 43; 47; 55; 56; 62; 67]; Extended producer responsibility[11; 16; 28; 7; 29; 37; 41; 42; 47; 50; 56; 59; 65; 69 ; Return systems[19; 11; 1; 6; 14; 7; 33; 34; 37; 43; 46; 48; 51; 55; 56; 61; 65]; Collection and sorting[32; 1; 6; 12; 14; 19; 5; 11; 7; 33; 16; 6; 34; 35; 21; 28; 3; 37; 38; 40; 41; 42; 43; 46; 50; 51; 55; 57; 59; 62; 63; 67; 69; 70; 71; Mechanical separation[32; 34; 21; 37; 40; 46; 59; 60; 63; 64]; Digital technologies (Blockchain; RFID; IOT; Digital Product Passport; Data technology; Big Data; Industry 4.0; Artificial Intelligence; NIR Spectroscopy; Digital Twins (DT), AI/ML analytics, Cloud-based storage)[2; 11; 12; 32; 9; 17; 28; 7; 33; 36; 37; 38; 39; 40; 41; 42; 44; 45; 46; 47; 48; 53; 54; 56; 59; 61; 62; 64; 65; 66; 69; 70; 72	
Recovery	Retail sales[15; 72]; Industrial symbiosis[35; 17; 33; 37; 60; 61; 70]; Partnership with recycling facilities[3; 33]; Waste fuel for energy industry[10; 28; 44; 50; 56]; Co-fuel for cement/brick production[10; 28]; Fermentation (ethanol manufacture)[16]; Manufacture of building materials[16; 5]; Design for the environment[4; 3; 7; 33]; Design for recovery[3; 7; 33; 37]; Design for disassembly[3; 24]; Eco-design[11; 15; 5; 22; 7; 33; 37; 39; 40; 42; 45; 48]; Energy recovery[10; 9; 17; 22; 29; 16; 21; 50]; Hydrothermal treatment[6]; Manufacture of disposable diapers[21]; Processing into polymers[21]; Manufacture of geotextiles[21]; Pellet manufacture (polyester and nylon)[28; 10]; Design for recycling[12; 62; 61]; Closed-loop recycling[37; 39; 24; 40; 43; 45; 46; 47; 51; 58; 60; 62; 65; 66; 70]; Manufacture of felt[21]; Design for circularity[12; 19; 14; 37; 46; 49; 54; 59; 62; 71	Redesign[24; 2; 7; 23; 22]; Wallet manufacturing[21]; Slipper/shoe manufacturing[21; 33]; Trashion[34]; Circular Economy[30; 17; 33; 8; 6; 13; 37; 38; 40; 43; 47; 49; 51; 52; 53; 54; 57; 58; 59; 60; 61; 62; 65; 66; 67; 69]; Repair and modification[24; 4; 2; 11; 19; 3; 25; 27; 17; 12; 28; 22; 31; 1; 7; 30; 34; 23; 39; 40; 43; 44; 46; 47; 48; 49; 51; 56; 61; 62; 65; 70; 71]; Donation[24; 23; 2; 19; 28; 31; 1; 12; 7; 16; 6; 34; 21]; Sale/Resale[24; 19; 23; 12; 32; 9; 21; 15; 28; 22; 31; 1; 33; 16; 6; 38]; Downcycling[23; 2; 10; 22; 31; 16; 6]; Repurposing[22; 7; 23; 21; 36]; Reuse[30; 23; 3; 2; 19; 11; 10; 9; 28; 22; 21; 31; 7; 33; 29; 16; 6; 12; 34; 36; 37; 38; 39; 40; 42; 44; 46; 47; 49; 54; 56; 61; 65; 70]; Second-hand markets[2; 11; 19; 12; 32; 15; 20; 22; 1; 33; 16; 21; 27; 6; 34; 37; 38; 42; 55; 60; 62
	Remanufacturing[4; 30; 5; 2; 11; 27; 25; 17; 22; 31; 33; 34; 21; 47; 61; 63; 65; 70]; Fiber reprocessing[5; 3; 2; 10; 15; 22; 7; 33; 16; 21; 38; 43; 47; 52; 56; 60]; Upcycling[23; 2; 19; 12; 14; 3; 27; 25; 10; 17; 22; 16; 6; 34; 39; 43; 47; 51; 58; 60; 72]; Recycling[4; 30; 23; 5; 3; 2; 11; 19; 12; 27; 35; 25; 9; 17; 15; 28; 22; 1; 7; 33; 29; 16; 6; 34; 21; 36; 37; 38; 39; 40; 41; 42; 44; 48; 54; 55; 58; 62; 65; 71; 72]; Mechanical recycling[32; 35; 28; 29; 16; 6; 21; 37; 43; 50; 51; 56; 59; 61; 64; 70]; Thermal recycling[32; 28; 16; 56; 58]; Biochemical recycling[32; 28]; Chemical recycling[32; 28; 22; 35; 29; 16; 6; 21; 37; 43; 50; 56; 58; 61; 64; 70]; Enzymatic recycling[29; 40; 43; 58; 64]; Enzymatic hydrolysis of cotton/polyester[6; 16; 50; 64]; Use as carpet padding[10; 28; 31; 21]; Use as acoustic insulation[10; 31; 21 ; Industrial cleaners[21]; Manufacture of napkins[21; 5]; Recycled fiber[21; 5]; Gasification[32]; Composting[16; 6; 64]; Anaerobic digestion[16; 6	
Final disposal	Export of waste[5; 28; 31; 16; 6; 21; 42]; Incineration[24; 30; 23; 5; 12; 25; 9; 28; 14; 22; 16; 31; 7; 29; 6; 13; 21; 50; 67]; Landfill[24; 4; 30; 14; 23; 5;16; 12; 10; 6; 9; 28; 31; 7; 29; 13; 21; 50; 67]; Waste management[4; 30; 23; 3; 9; 26; 53; 56]; Environmentally friendly disposal practices[1; 7	
General	Limiting virgin products[22; 33]; R&D[3]; Production of ecologically conscious and environmentally preferable clothing[23; 3; 7; 33; 37]; Use of recycled fiber[5; 3; 2; 10; 15; 22; 31; 7; 33; 8; 16; 6; 34; 21; 37; 68]; Use of recycled fabric[2; 10; 31; 33; 16; 6; 34; 37 ; Production of long-lasting clothing[33; 2; 15]; Culture of innovation[3; 11; 33; 26]; Investments[13; 41]; Governance[15]; Collaborative economy[22; 31; 7; 14; 13; 36; 40; 60; 62]; Carbon Credit Mechanisms[47; 50]; Ecodesign for Sustainable Products Regulation (ESPR)[48]; Bio-fabrication[43; 45]; Nanotechnology[43]; Biotechnology[43]; Smart textiles[43]; Design thinking[33]	Consumer/stakeholder education/ awareness[11; 32; 9; 5; 28; 22; 7; 14; 8; 13; 30; 37; 62; 66]; Buying ecologically conscious and environmental preferable clothing[23; 3; 7; 33]; 3Rs[41; 36; 39; 45; 52; 55; 54; 57; 72]; 4Rs[24; 2; 32; 22; 59; 66]; 5Rs[48; 56; 69]; Subscription plan[31; 22; 41]; Sharing economy[37]; Renting clothes[3; 2; 11; 22; 31; 7; 33; 16; 20; 23; 39; 46
	Certification[7; 5; 3; 42; 44]; Capital raising networks[39]; Policies[28; 7; 8; 16; 13; 42; 66]; Government incentives[3; 28; 7; 8; 16; 37; 39; 41; 47; 66	

*References codes: 1 – Abdallah et al. (2024); 2 – Abdelmeguid et al. (2024); 3 – Adenle et al. (2024); 4 – Ashby (2018); 5 – Boschmeier et al. (2024); 6 – Choudhury et al. (2024); 7 – Degenstein et al. (2023); 8 – Dhiwar and Bedarkar (2024); 9 – Dursun et al. (2023); 10 – Edirisinghe et al. (2024); 11 – Ermini et al. (2024); 12 – Ghoreishi et al. (2022); 13 – Gomes et al. (2023); 14 – Han et al. (2017); 15 – Härri and Levänen (2024); 16 – Juanga-Labayen et al. (2022); 17 – Kayikci et al. (2022); 18 – Kazancoglu et al. (2022); 19 – Khan et al. (2023); 20 – Kim and Wu (2021); 21 – Moazzem et al. (2022); 22 – Oliveira Neto et al. (2024); 23 – Patwary et al. (2023); 24 – Pera and Ferrulli (2024); 25 – Ranjan et al. (2024); 26 – Rumanti et al. (2021); 27 – Singh et al. (2019); 28 – Sinha et al. (2022); 29 – Solis et al. (2024); 30 – Staicu and Pop (2018); 31 – Staicu (2019); 32 – Tang (2023); 33 – Teixeira et al. (2023); 34 – Vehmas et al. (2018); 35 – Yadav and Majumdar (2024); 36 – Pal et al. (2025); 37 – Sharma et al. (2025); 38 – Brandner et al. (2025); 39 – Nguyen et al. (2025); 40 – S. B. Madumali et al. (2025); 41 – S. Madumali et al. (2025); 42 – Bussolo et al. (2026); 43 – Rahaman and Khan (2025); 44 – Abreu et al. (2025); 45 – Basile et al. (2025); 46 – Dehghannejad et al. (2025); 47 – Raman et al. (2025); 48 – Carvalho et al. (2025); 49 – O'Nascimento et al. (2026); 50 – Khan et al. (2025); 51 – Bukhantsova et al. (2024); 52 – Gök et al. (2025); 53 – Angelova (2025); 54 – Civera et al. (2025); 55 – Behal et al. (2025); 56 – Shamsuzzaman et al. (2025b); 57 – Shamsuzzaman et al. (2025a); 58 – Hossain et al. (2025); 59 – Thomas et al. (2024); 60 – Kuo et al. (2025); 61 – Krüger et al. (2025); 62 – Parro-Ruiz et al. (2026); 63 – Riisgaard (2026); 64 – Abtew et al. (2025); 65 – Sadurya and Selvaranee (2025); 66 – Graciano et al. (2025); 67 – López et al. (2024); 68 – Biswas et al. (2026); 69 – Ajwani-Ramchandani et al. (2025); 70 – Herrador and Imanishi (2025); 71 – Manolchev et al. (2024); 72 – Florea-Burduja et al. (2025).

products with greater value (Singh et al., 2019). This category includes activities that support the CE by extending consumption and production cycles, thereby reducing environmental impacts.

The final disposal category includes components for the final destination. We identified four main approaches: landfill, incineration, waste management and export to other countries, where these materials are disposed of. Although intended as secondary options for non-recoverable waste, many developing countries adopt these practices as primary, representing an obstacle to the sustainability of the textile industry (Boschmeier et al., 2024).

Finally, the general category includes additional components that impact RSC but do not fit into other classifications. These include regulatory

policies, restrictions on use of raw materials, certifications, government incentives and consumer awareness, as listed in Table 3. Two of these practices are relevant: legislation plays an important role in advancing the transition to a circular model. Weak enforcement and poorly applied penalties undermine the effectiveness of regulatory frameworks. Stricter laws and efficient enforcement are key to driving change in the industry (Dhiwar and Bedarkar, 2024). As far as sustainable consumption is concerned, practices adopted by consumers, such as reselling, exchanging and returning clothes are on the rise (Khan et al., 2023). However, structural challenges, such as inadequate infrastructure for proper disposal, can hinder the adoption of these practices.

In summary, additional components analyzed aim to promote conscious consumption, cleaner and more efficient production, and foster collaboration among stakeholders. These strategies contribute to minimizing waste and emissions, as well as optimizing the use of resources (Rumanti et al., 2021). The literature presents a wide range of initiatives capable of boosting RSC, and the systemic ordering of this data can facilitate the transition from the linear to the circular model and promote greater sustainability in the textile industry.

This study contributes to theory and practice, as well as identifying gaps in the literature on textile RSC. The theoretical contributions focus on categorizing stakeholders, additional components and proposing a framework that describes different types of flows and interactions among actors in a textile CSC. This categorization consolidates knowledge on the subject, which is still scattered and poorly structured in the literature. Considering that textile RSC is more complex than FSC, with stakeholders still acting in an isolated and non-collaborative way, these results contribute to overcoming these difficulties and advancing the industry's transition toward a circular model of production and consumption.

The proposed theoretical framework may prove essential for identifying gaps in the subject. It can guide identification and organization of the stakeholders involved, fostering circularity in the textile industry, enabling strategic interactions between FSC and RSC, as well as providing guidance on practices that encourage new businesses (especially RL and recovery) and contribute to structure the textile CSC. The gaps refer to the scant mention in the literature of key stakeholders for the textile RSC, highlighting the limited knowledge about responsibilities and activities, as well as interactions among RSC and FSC stakeholders. This gap makes it difficult to understand the reality of the textile industry by not considering all stakeholders, reflecting opportunities for future research on the multi-stakeholders involved.

Figure 1 summarizes the 24 identified textile CSC stakeholders and their interactions in post-consumer textile RSC. The flows represent

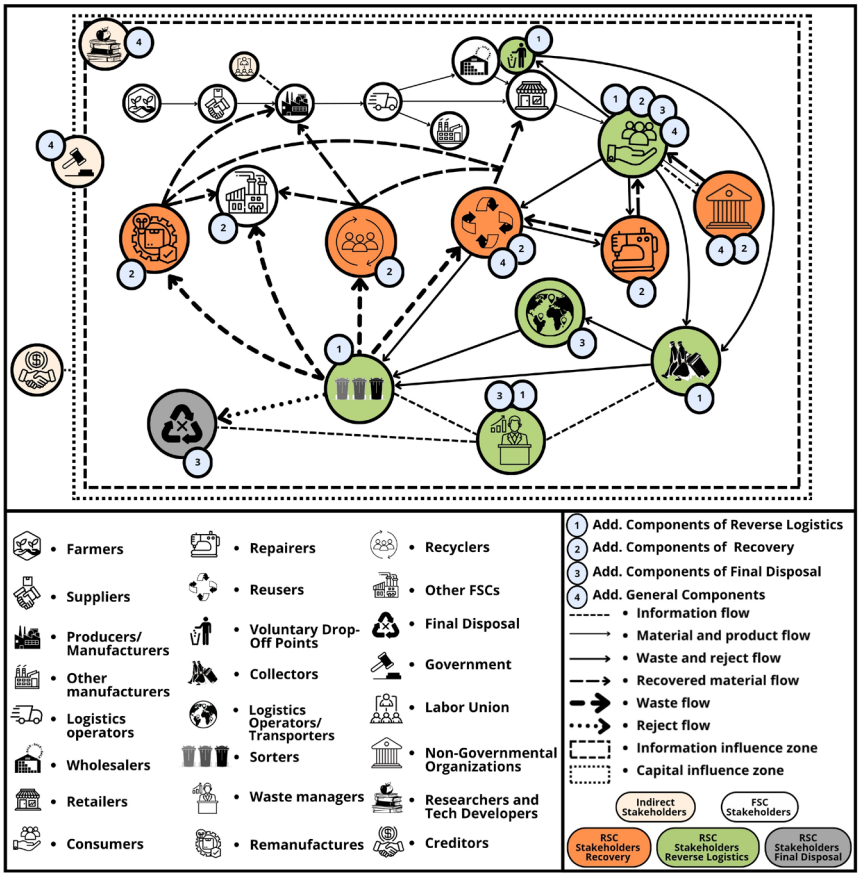


Figure 1 – Representation of the reverse supply chain (RSC)-focused textile circular supply chain (CSC).

the movement of materials, waste, refuses, recovered materials and information, as well as the scope of the stakeholders in the informational and financial perspectives.

Textile RSC is complex and collaborative, and Figure 1 illustrates inter-stakeholder flows, excluding internal interactions such as direct donations among individuals. Although the focus of the proposed textile RSC is on post-consumption, RSC should cover all stakeholders along the SC, as waste generation occurs at all stages.

Conclusion

This study proposes a framework that represents components in textile RSC. We identified and categorized 16 RSC stakeholders, highlighting activities, flows and interrelationships. We also found that the effectiveness of RSC in the textile industry also depends on indirect stakeholders involved with waste, such as policymakers, financiers and knowledge producers. Collaboration among stakeholders has proved essential to boosting CE. However, obstacles such as insufficient financial incentives, weak regulatory frameworks, and limited consumer awareness continue to constrain RSC. Most of the additional components mapped refer to recycling and manufacture of new products, as well as initiatives such as Ecodesign, use of recyclable materials, and practices encouraging CE, which improve waste management and reduce dependence on raw materials.

The main contributions include the systematization of stakeholders and additional components that are still poorly organized in the literature, as well as a framework based on the state of the art that guides the structuring of RSC, facilitating its implementation and offering support for strategic planning and transition to a more circular, sustainable and resilient system. A systemic understanding of stakeholder interactions is essential for strengthening RSC, especially in countries where the role of marginalized stakeholders such as waste pickers and social organizations is important for advancing the circularity in SC.

The study reinforces the importance of multi-sector collaboration and policies to encourage RSC in the textile industry. As future research, we recommend investigating the waste generated into the FSC, since the focus of this study was on post-consumer waste. We hope the insights presented serve as a basis for strategies to accelerate the transition to a CSC in the textile industry.

Author's Contributions

Teixeira, V.E.G.: conceptualization; data curation; formal analysis; investigation; methodology; validation; visualization; writing – original draft. **Nunes**, D.R.L.: formal analysis; investigation; validation; writing – review & editing. **Martins**, V.W.B.: formal analysis; investigation; validation; writing – review & editing. **Santos**, I.S.: formal analysis; investigation; validation; writing – review & editing. **Nagata,** V.M.N.: formal analysis; investigation; methodology; supervision; validation; writing – review & editing. **Melo**, A.C.S.: conceptualization; formal analysis; funding acquisition; investigation; methodology; project administration; supervision; validation; writing – review & editing.

References

Abdallah, A.B.; Ray, S.; Mim, S.J.; Mahmud, T.S.; Richter, A. et al., 2024. Assessment of demographics and motivations of post-consumer textile waste management using a bibliometric approach. Journal of Material Cycles and Waste Management, v. 26. (4), 2534-2545. https://doi.org/10.1007/s10163-024-01994-8.

Abdelmeguid, A.; Tsironis, G.; Afy-Shararah, M.; Tsagarakis, K.P.; Salonitis, K., 2024. Insights into sustainability and circular economy trends in luxury fashion: A LinkedIn topic modelling study. Cleaner and Responsible Consumption, v. 15, 100228. https://doi.org/10.1016/j.clrc.2024.100228.

Abreu, H.; Pereira, V.; Barata, J., 2025. Blockchain-based digital product passport: design principles and demonstration. International Journal of Production Research, v. 63, (16), 5863-5882. https://doi.org/10.1080/00207543.2025.2464161.

Abtew, M.A.; Atalie, D.; Dejene, B.K., 2025. Recycling of cotton textile waste: Technological process, applications, and sustainability within a circular economy. Journal of Industrial Textiles, v. 55. https://doi.org/10.1177/15280837251348663.

Adenle, Y.A.; Haideri, S.; Sandouka, I., 2024. Understanding the best practices of cradle-to-cradle in furnishings, carpet, and textile industries–A case studies analysis and conceptual model. Cleaner and Circular Bioeconomy, v. 8, 100088. https://doi.org/10.1016/j.clcb.2024.100088.

Ajwani-Ramchandani, R.; Bhattacharya, S.; Ramchandani, T.; Jha, S.K., 2025. Towards circular economy for managing post-consumer textile and garment waste in India using new technologies. Social Responsibility Journal, v. 21, (9), 1784-1805. https://doi.org/10.1108/SRJ-01-2025-0050.

Alfaia, A.T.T.; D'Ávila, A.L.M.; Santos Lobato, F.; Dias, I.C.; Nagata, V.M.N. et al., 2025. Stakeholders and responsibilities in reverse supply chain for empty pesticide containers: a literature review. Sanitary and Environmental Engineering, v. 30, e20240133. https://doi.org/10.1590/S1413-415220240133.

Amaral, M.C.; Zonatti, W.F.; Silva, K.L.; Karam Junior, D.; Amato Neto, J. et al., 2018. Industrial textile recycling and reuse in Brazil: case study and considerations concerning the circular economy. Gestão & Produção, v. 25, (3), 431-443. https://doi.org/10.1590/0104-530X3305.

Angelova, R.A., 2025. Digital twins for a sustainable textile industry: a critical analysis of unexplored applications and future directions. Textiles, v. 5, (4), 49. https://doi.org/10.3390/textiles5040049.

Aparas Liberdade, 2024. Descarte consciente de tecidos em São Paulo: Iniciativas para minimizar o impacto ambiental da indústria da moda (Accessed Feb. 24, 2025) at:. https://aparasliberdade.com.br/descarte-consciente-de-tecidos/.

Ashby, A., 2018. Developing closed loop supply chains for environmental sustainability: Insights from a UK clothing case study. Journal of Manufacturing Technology Management, v. 29, (4), 699-722. https://doi.org/10.1108/JMTM-12-2016-0175.

Associação Brasileira da Indústria Têxtil e de Confecção (ABIT), 2018. O poder da moda: cenários, desafios, perspectivas, 2015-2018. ABIT (Accessed Oct. 5, 2024) at:. http://abit-files.abit.org.br/site/publicacoes/Poder_moda-cartilhabx.pdf.

Associação Brasileira da Indústria Têxtil e de Confecção (ABIT), 2024. Perfil do Setor. ABIT (Accessed Nov. 10, 2024) at:. https://www.abit.org.br/cont/perfil-do-setor.

Associação Brasileira de Empresas de Limpeza Pública e Resíduos Especiais (ABRELPE), 2022. O futuro do setor de gestão de resíduos. ABRELPE (Accessed Nov. 21, 2024) at:. https://www.abrema.org.br/o-futuro-do-setor-de-gestao-de-residuos/.

Basile, V.; Capobianco, N.; Vona, R., 2025. Business model development in the circular bioeconomy: A focus on the fashion-textile industry. Journal of Cleaner Production, v. 494, 144944. https://doi.org/10.1016/j.jclepro.2025.144944.

Behal, A.; Islam, S.; Tan, C.S.L., 2025. Exploring circular economy practices in school uniforms: a study on parental perspectives from Australia. Sustainability, v. 17, (11), 5158. https://doi.org/10.3390/su17115158.

Berlin, D.; Feldmann, A.; Nuur, C., 2022. Supply chain collaborations in a circular economy: a case study of Swedish steel recycling. Resources, Conservation and Recycling, v. 179, 106112. https://doi.org/10.1016/j.resconrec.2021.106112.

Biswas, M.K.; Biswas, M.K.; Preeti, I.A.; Rimzhim, T.R.; Li, W. et al., 2026. The hidden environmental footprint of fashion's smallest parts. Sustainable Horizons, v. 18, 100179. https://doi.org/10.1016/j.horiz.2026.100179.

Boschmeier, E.; Ipsmiller, W.; Bartl, A., 2024. Market assessment to improve fibre recycling within the EU textile sector. Waste Management & Research, v. 42, (2), 135-145. https://doi.org/10.1177/0734242X231178222.

Brandner, M.; Pfoser, S.; Voraberger, E.; Brandtner, P.; Schauer, O., 2025. Advancing circular economy in the textile industry: a comprehensive study of reverse logistics and operational practices in Austria. Procedia Computer Science, v. 263, 98-106. https://doi.org/10.1016/j.procs.2025.07.013.

Bukhantsova, L.; Zacharkevich, O.; Luschevska, O.; Krasniuk, L.; Koshevko, Y. et al., 2024. Data analysis for the prediction of textile waste recycling in Ukraine. Vlakna A Textil, v. 31, (2), 66-73. https://doi.org/10.15240/tul/008/2024-2-009.

Bussolo, G.H.; Visintin, F.; Saccani, N.; Bressanelli, G., 2026. Assessing stakeholder engagement to the EU strategy for sustainable and circular textiles: A Systematic review integrating stakeholder and institutional theories. Journal of Environmental Management, v. 397, 128308. https://doi.org/10.1016/j.jenvman.2025.128308.

Carvalho, C.; Silva, C.J.; Abreu, M.J., 2025. Circular economy: Literature review on the implementation of the digital product passport (DPP) in the textile industry. Sustainability, v. 17, (5), 1802. https://doi.org/10.3390/su17051802.

Choudhury, K.; Tsianou, M.; Alexandridis, P., 2024. Recycling of blended fabrics for a circular economy of textiles: separation of cotton, polyester, and elastane fibers. Sustainability, v. 16, (14), 6206. https://doi.org/10.3390/su16146206.

Civera, C.; Santoro, G.; Chiaudano, V., 2025. Do not stop the loop: driving circular textiles with technology and stakeholder engagement. Business Strategy and the Environment, v. 34, (5), 5317-5335. https://doi.org/10.1002/bse.4250.

D'Ávila, A.L.M.; Nunes, D.R.L.; Martins, V.W.; Braga Junior, A.E.; Melo, A.C.S., 2025. Responsibilities in reverse supply chains of waste electrical and electronic equipment: A literature review. Engenharia Sanitária e Ambiental, v. 30, e20240093. https://doi.org/10.1590/S1413-415220240093.

Das, K.; Posinasetti, N.R., 2015. Addressing environmental concerns in closed loop supply chain design and planning. International Journal of Production Economics, v. 163, 34-47. https://doi.org/10.1016/j.ijpe.2015.02.012.

Degenstein, L.M.; McQueen, R.H.; Krogman, N.; McNeill, L.S., 2023. Integrating product stewardship into the clothing and textile industry: perspectives of New Zealand stakeholders. Sustainability, v. 15, (5), 4250. https://doi.org/10.3390/su15054250.

Dehghannejad, M.; Pal, R.; Dissanayake, K., 2025. Cascading of circular business models in the textile and clothing industry: Insights for operationalization through a systematic review. Resources, Conservation & Recycling Advances, v. 28, 200293. https://doi.org/10.1016/j.rcradv.2025.200293.

Dhiwar, K.; Bedarkar, M., 2024. Circular economy for fashion waste in the Indian fashion industry: challenges and opportunities. Fashion Practice, v. 16, (3) 344-372. https://doi.org/10.1080/17569370.2024.2393495.

Dursun, E.; Ulker, Y.; Gunalay, Y., 2023. Blockchain's potential for waste management in textile industry. Management of Environmental Quality, v. 34, (4), 1174-1197. https://doi.org/10.1108/MEQ-03-2022-0085.

Edirisinghe, L.G.L.M.; Alwis, A.A.P.; Prakash, S.; Wijayasundara, M., 2024. Optimizing material circularity pathways in industrial waste streams: A decision-making model. MethodsX, v. 13, 102813. https://doi.org/10.1016/j.mex.2024.102813.

Elia, V.; Gnoni, M.G., 2015. Designing an effective closed loop system for pallet management. International Journal of Production Economics, v. 170, (part C), 730-740. https://doi.org/10.1016/j.ijpe.2015.05.030.

Ellen Macarthur Foundation, 2013. Towards the circular economy: economic and business rationale for an accelerated transition. Ellen Macarthur Foundation (Accessed Nov. 10, 2024) at:. https://content.ellenmacarthurfoundation.org/m/4384c08da576329c/original/Towards-a-circular-economy-Business-rationale-for-an-accelerated-transition.pdf.

Ellen Macarthur Foundation, 2017. A new textiles economy: redesigning fashion's future. Ellen Macarthur Foundation (Accessed Nov. 10, 2024) at:. https://www.ellenmacarthurfoundation.org/a-new-textiles-economy.

Ermini, C.; Visintin, F.; Boffelli, A., 2024. Understanding supply chain orchestration mechanisms to achieve sustainability-oriented innovation in the textile and fashion industry. Produção e Consumo Sustentáveis, v. 49, 415-430. https://doi.org/10.1016/j.spc.2024.07.008.

Farooque, M.; Zhang, A.; Thürer, M.; Qu, T.; Huisingh, D., 2019. Circular supply chain management: A definition and structured literature review. Journal of Cleaner Production, v. 228, 882-900. https://doi.org/10.1016/j.jclepro.2019.04.303.

Fischer, A.; Pascucci, S., 2017. Institutional incentives in circular economy transition: the case of material use in the Dutch textile industry. Journal of Cleaner Production, v. 155, (part 2), 17-32. https://doi.org/10.1016/j.jclepro.2016.12.038.

Florea-Burduja, E.; Irovan, M.; Indrie, L.; Frunze, V.; Raru, A. et al., 2025. "Zero waste"–current and essential concept in the fashion industry. Industria Textila, v. 76, (3), 334-341. https://doi.org/10.35530/IT.076.03.2024132.

Ghoreishi, M.; Bhandari, K.; Franconi, A., 2022. Smart fashion economy through a data-driven circular ecosystem: a case study. In: IOP Conference Series: Earth and Environmental Science. IOP Publishing, v. 1009, 012012. https://doi.org/10.1088/1755-1315/1009/1/012012.

Gök, A.E.; Selçuk, H.; Feyzioğlu, A., 2025. Developing sector wide sustainability strategies for small and medium sized textile enterprises through materiality analysis. Sustainable Futures, v. 10, 101341. https://doi.org/10.1016/j.sftr.2025.101341.

Gomes, G.M.; Moreira, N.; Iritani, D.R.; Amaral, W.A.; Ometto, A.R., 2023. Systemic circular innovation: barriers, windows of opportunity and an analysis of Brazil's apparel scenario. Fashion Practice, v. 15, (1), 6-35. https://doi.org/10.1080/17569370.2021.1987645.

Graciano, P.; Matias, G.S.; Mierlo, K.G.; Aranha, A.C.; Lermen, F.H., 2025. Replacing toxic nanomaterials in the textile industry: a review of recent advances and challenges. Química Nova, v. 48, (8), e-20250221. https://doi.org/10.21577/0100-4042.20250221.

Han, S.C.; Henninger, C.E.; Blanco-Velo, J.; Apeagyei, P.; Tyler, D.J., 2017. The circular economy fashion communication canvas. In: Bakker, C.A.; Mugge, R. (Eds.), PLATE product lifetimes and the environment. IOS Press, pp. 161-165. https://doi.org/10.3233/978-1-61499-820-4-161.

Härri, A.; Levänen, J., 2024. It should be much faster fashion- textile industry stakeholders' perceptions of a just circular transition in Tamil Nadu, India. Discover Sustainability, v. 5, (1), 39. https://doi.org/10.1007/s43621-024-00211-8.

Herrador, M.; Imanishi, M., 2025. Unlocking the circular economy potential in the textiles and fashion industries of Japan: Opportunities for European businesses. Journal of Cleaner Production, v. 486, 144491. https://doi.org/10.1016/j.jclepro.2024.144491.

Hossain, M.I.; Zhang, Y.; Haque, A.N.M.A.; Naebe, M., 2025. Fibrous microplastics release from textile production phases: a brief review of current challenges and applied research directions. Materials, v. 18, (11), 2513. https://doi.org/10.3390/ma18112513.

Inside Waste, 2020. Tackling textile waste (Accessed July 5, 2024) at:. https://www.insidewaste.com.au/.

Jena, S.K.; Sarmah, S.P., 2014. Price competition and co-operation in a duopoly closed-loop supply chain. International Journal of Production Economics, v. 156, 346-360. https://doi.org/10.1016/j.ijpe.2014.06.018.

Juanga-Labayen, J.P.; Labayen, I.V.; Yuan, Q., 2022. A review on textile recycling practices and challenges. Têxteis, v. 2, (1), 174-188. https://doi.org/10.3390/textiles2010010.

Kayikci, Y.; Kazancoglu, Y.; Gozacan-Chase, N.; Lafci, C.; Batista, L., 2022. Assessing smart circular supply chain readiness and maturity level of small and medium-sized enterprises. Journal of Business Research, v. 149, 375-392. https://doi.org/10.1016/j.jbusres.2022.05.042.

Kazancoglu, I.; Kazancoglu, Y.; Kahraman, A.; Yarimoglu, E.; Soni, G., 2022. Investigating barriers to circular supply chain in the textile industry from Stakeholders' perspective. International Journal of Logistics Research and Applications, v. 25, (4-5), 521-548. https://doi.org/10.1080/13675567.2020.1846694.

Khan, M.I.; Islam, M.T.; Wang, L.; Padhye, R., 2025. Comparative energy demand and carbon footprint analysis of textile waste management systems in Australia. Environmental Science and Pollution Research, v. 32, (13), 8529-8546. https://doi.org/10.1007/s11356-025-36200-1.

Khan, M.I.; Wang, L.; Padhye, R., 2023. Textile waste management in Australia: A review. Recursos, Conservação e Reciclagem Advances, v. 18, 200154. https://doi.org/10.1016/j.rcradv.2023.200154.

Kim, Y.; Wu, S., 2021. Circular economy meets the fashion industry: challenges and opportunities in New York City. In: Bisello, A.; Vettorato, D.; Haarstad, H.; Borsboom, J.; Beurden, V. (Eds,), Smart and sustainable planning for cities and regions: results of SSPCR 2019. Springer Nature, pp. 293-312. https://doi.org/10.1007/978-3-030-57332-4_21.

Koszewska, M., 2018. Circular economy: challenges for the textile and clothing industry. Autex Research Journal, v. 18, (4), 337-347. https://doi.org/10.1515/aut-2018-0023.

Krüger, K.; Böttcher, T.; Jonas, M.E.; Krcmar, H., 2025. Leveraging digital product passports to overcome circular economy challenges: comparative insights from the textile and semiconductor industries. In: IEEE Conference on Technologies for Sustainability. IEEE, pp. 1-8. https://doi.org/10.1109/SusTech63138.2025.11025717.

Kuo, T.C.; Chen, H.Y.; Rahmat, D.A.; Rumanti, A.A., 2025. Industrial symbiosis practice for stakeholders: insights from textile practices for sectoral transformation. International Journal of Precision Engineering and Manufacturing-Green Technology, v. 12, 1939-1950. https://doi.org/10.1007/s40684-025-00767-4.

Lehner, M.; Mont, O.; Mariani, G.; Mundaca, L., 2020. Circular economy in home textiles: motivations of IKEA consumers in Sweden. Sustainability, v. 12, (12), 5030. https://doi.org/10.3390/su12125030.

Lin, C.Y.; Rahaman, M.; Moslehpour, M.; Chattopadhyay, S.; Arya, V., 2023. Web semantic-based MOOP Algorithm for facilitating allocation problems in the supply chain domain. International Journal on Semantic Web and Information Systems, v. 19, (1), 1-23. https://doi.org/10.4018/IJSWIS.330250.

López, J.L.; Rahnama, S.; Ciprés, D.; Polo, L.; Escuín, D., 2024. Simulation-based optimization for sustainable textile waste collection routes. In: Transport Research Arena Conference. Springer Nature, Cham, pp. 695-702. https://doi.org/10.1007/978-3-031-95284-5_97.

Luz, S., 2022. Indústria da moda é a segunda mais poluidora do mundo, aponta estudo. Agência Brasil (Accessed September 20, 2024) at.: https://agenciabrasil.ebc.com.br/radioagencia-nacional/economia/audio/2022-10/industria-da-moda-e-segunda-mais-poluidora-do-mundo-aponta-estudo.

Madumali, S.B.; Thibbotuwawa, A.; Saniuk, S.; Nielsen, P., 2025. An overview of state-of-the-art technologies for textile supply chain circularity adoption. IFAC-PapersOnLine, v. 59, (24), 72-77. https://doi.org/10.1016/j.ifacol.2025.11.843.

Madumali, S.; Thibbotuwawa, A.; Sivakumar, T.; Nielsen, P., 2025. Analyzing barriers to circular economy implementation in textile supply chains: a fuzzy Delphi and ISM approach for developing economies. IFAC-PapersOnLine, v. 59, (10), 2124-2129. https://doi.org/10.1016/j.ifacol.2025.09.357.

Mangla, S.K.S.; Luthra, N.; Mishra, A.; Singh, N.P.; Rana, M. et al., 2018. Barriers to effective circular supply chain management in a developing country context. Production Planning & Control, v. 29, (6), 551-569. https://doi.org/10.1080/09537287.2018.1449265.

Manolchev, C.; Cherrington, R.; Crabolu, G., 2024. Untangling circularity: Transitioning to a regional circular economy in the clothing and textile sector in England. Journal of Cleaner Production, v. 482, 144188. https://doi.org/10.1016/j.jclepro.2024.144188.

Martins, V.W.B.; Nunes, D.R.L.; Melo, A.C.S.; Brandão, R.; Braga Júnior, A.E. et al., 2022. Analysis of the activities that make up the reverse logistics processes and their importance for the future of logistics networks: an exploratory study using the TOPSIS technique. Logistics, v. 6, (3), 60. https://doi.org/10.3390/logistics6030060.

Melo, A.C.S.; Nunes, D.R.L.; Braga Júnior, A.E.; Lima, R.B.; Nagata, V.M.N. et al., 2022. Analysis of activities that make up reverse logistics processes:

proposition of a conceptual framework. Brazilian Journal of Operations and Production Management, v. 19, (2), e20221376. https://doi.org/10.14488/BJOPM.2022.001.

Menegucci, F.; Marteli, L.; Camargo, M.; Vito, M., 2015. Resíduos têxteis: Análise sobre descarte e reaproveitamento nas indústrias de confecção. In: XI Congresso Nacional de Excelência em Gestão (Accessed June 20, 2024) at:. https://www.researchgate.net/profile/Leticia-N-Marteli/publication/318930023_Residuos_texteis_Analise_sobre_descarte_e_reaproveitamento_nas_industrias_de_confeccao/links/598628010f7e9b6c853492b4/Residuos-texteis-Analise-sobre-descarte-e-reaproveitamento-nas-industrias-de-confeccao.pdf.

Milan, G.S.; Vittorazzi, C.; Vittorazzi, C., 2010. A redução de resíduos têxteis e de impactos ambientais: um estudo desenvolvido em uma indústria de confecções do vestuário. In: XIII Seminários de Administração, São Paulo. pp. 17 (Accessed July 8, 2024) at:. https://www.researchgate.net/profile/Gabriel-Sperandio-Milan/publication/346541653_A_Reducao_de_Residuos_Texteis_e_de_Impactos_Ambientais_Um_Estudo_Desenvolvido_em_uma_Industria_de_Confeccoes_do_Vestuario/links/5fc6827245851568d13208c8/A-Reducao-de-Residuos-Texteis-e-de-Impactos-Ambientais-Um-Estudo-Desenvolvido-em-uma-Industria-de-Confeccoes-do-Vestuario.pdf.

Moazzem, S.; Crossin, E.; Daver, F.; Wang, L., 2022. Environmental impact of apparel supply chain and textile products. Meio Ambiente, Desenvolvimento e Sustentabilidade, v. 24, 9757-9775. https://doi.org/10.1007/s10668-021-01873-4.

Monash University, 2021. Coming full circle on fast fashion for a sustainable future (Accessed Dec. 6, 2024) at:. https://lens.monash.edu/coming-full-circle-on-fast-fashion-for-a-sustainable-future/.

Nguyen, M.H.; Islam, S.; Tan, C.S.L., 2025. An examination of barriers and enablers to circular economy transition among small and medium-sized enterprises in the Vietnamese fashion and textile industry. Cleaner Production Letters, v. 10, 100125. https://doi.org/10.1016/j.clpl.2025.100125.

Nobre, A.V.; Oliveira, C.C.R.; Nunes, D.R.L.; Melo, A.C.S.; Guimarães, G.E. et al., 2022. Analysis of decision parameters for route plans and their importance for sustainability: an exploratory study using the TOPSIS technique. Logistics, v 6, (2), 32. https://doi.org/10.3390/logistics6020032.

Nogueira, C.J.L.G.; Martins, V.W.B.; Braga Junior, A.E.; Pontes, A.N.; Nunes, D.R.L. et al., 2025. Outlining stakeholders responsibilities in reverse supply chains: a framework based on a systematic literature. Environmental Quality Management, v. 35, (2), e70233. https://doi.org/10.1002/tqem.70233.

Nunes, D.R.L.; Nascimento, D.S.; Matos, J.; Melo, A.C.S.; Martins, V.W.B. et al., 2023. Approaches to performance assessment in reverse supply chains: a systematic literature review. Logistics, v. 7, (3), 36. https://doi.org/10.3390/logistics7030036.

Oliveira Neto, G.C.D.; Santos, R.A.R.; Pinto, L.F.R.; Flausino, F.R.; Oliveira, D.E.P.D. et al., 2024. Innovative circular practices integrating business model for textile industry. Journal of Engineered Fibers and Fabrics, v. 19. https://doi.org/10.1177/15589250241226481.

O'Nascimento, R.; Petreca, B.; Seaton, M.; Baurley, S., 2026. Circular Shirt Builder: an apparel configurator to support healthier consumption boundaries in the textiles circular economy. Cleaner and Responsible Consumption, v. 21, 100390. https://doi.org/10.1016/j.clrc.2026.100390.

Pal, R.; Sandberg, E.; Dissanayake, K., 2025. A glocality perspective towards valorizing textile circular economy: unravelling the challenges and coping mechanisms. Journal of Fashion Marketing and Management, v. 29, (8), 1501-1506. https://doi.org/10.1108/JFMM-04-2025-0211.

Parro-Ruiz, A.; Medina-Salgado, M.S.; Ortiz-de-Urbina-Criado, M., 2026. Proposing a model to improve sustainability management in the textile industry. Business Strategy & Development, v. 9, (1), e70279. https://doi.org/10.1002/bsd2.70279.

Patwary, S.; Haque, M.A.; Kharraz, J.A.; Khanzada, N.K.; Farid, M.U. et al., 2022. Apparel consumer behavior and circular economy: towards a decision-tree framework for mindful clothing consumption. Sustainability, v. 15, (1), 656. https://doi.org/10.3390/su15010656.

Pera, R.; Ferrulli, E., 2024. Consumers' textile disposal practices and their perceived value in the circular economy: A platform focused ethnography approach. Business Strategy and the Environment, v. 33, (4), 2931-2948. https://doi.org/10.1002/bse.3616.

Rahaman, T.; Khan, S.H., 2025. Biomaterials for manufacturing environmentally sustainable textiles and apparel: sources, applications, challenges, enablers and future directions. International Journal of Environmental Science and Technology, v. 22, (10), 9655-9710. https://doi.org/10.1007/s13762-025-06481-7.

Raman, R.; Das, P.; Aggarwal, R.; Buch, R.; Palanisamy, B. et al., 2025. Circular economy transitions in textile, apparel, and fashion: AI-based topic modeling and sustainable development goals mapping. Sustainability, v. 17, (12), 5342. https://doi.org/10.3390/su17125342.

Ranjan, S.; Sharma, V.; Thakkar, J.J.; Gaddam, H.K., 2024. An integrated ISM-MICMAC approach for investigating sources of wastes in circular economy: a case of apparel industry. In: Operations Research Forum. Springer International Publishing, pp. 42. https://doi.org/10.1007/s43069-024-00320-0.

Riisgaard, L., 2026. Reclaiming waste: informal circularity in bangladesh and the struggle for green value in the apparel value chain. Circular Economy and Sustainability, v. 6, (2), 28. https://doi.org/10.1007/s43615-026-00844-z.

Rumanti, A.A.; Sunaryo, I.; Wiratmadja, I.I.; Irianto, D., 2021. Cleaner production through open innovation in Indonesian batik small and medium enterprises (SME). The TQM Journal, v. 33, (6), 1347-1372. https://doi.org/10.1108/TQM-04-2020-0086.

Sadurya, G.; Selvaranee, J.K., 2025. Redefining supply chain practices in the textile industry—Sustainable development through blockchain technology. Textile & Leather Review, v. 8, 273-303. https://doi.org/10.31881/TLR.2025.008.

Shamsuzzaman, M.; Al. Mamun, M.A.; Hasan, H.R.U.; Hassan, R.; Zulkernine, A. et al., 2025. Fashion circularity: potential of reusing and recycling remnant fabric to create sustainable products. Sustainability, v. 17, (5), 2010. https://doi.org/10.3390/su17052010.

Shamsuzzaman, M.; Islam, M.; Mamun, M.A.A.; Rayyaan, R.; Sowrov, K. et al., 2025. Fashion and textile waste management in the circular economy: a systematic review. Cleaner Waste Systems, v. 11, 100268. https://doi.org/10.1016/j.clwas.2025.100268.

Sharma, R.; Yadav, V.; Gaur, T.S.; Dixit, P., 2025. A systematic review on circular economy practices in the textile industries. Discover Applied Sciences, v. 7, (10), 1153. https://doi.org/10.1007/s42452-025-07446-8.

Silva, I.G.; Martins, V.W.B.; Braga Junior, A.E.; Lima, R.B.; Nagata, V.M.N. et al., 2025. Stakeholders and activities in reverse supply chains for construction and demolition waste: a literature review. Brazilian Journal of Environmental Sciences, v. 60, e2653. https://doi.org/10.5327/Z2176-94782653.

Singh, J.; Sung, K.; Cooper, T.; West, K.; Mont, O., 2019. Challenges and opportunities for scaling up upcycling businesses – The case of textile and wood upcycling businesses in the UK. Resources,

Conservation and Recycling, v. 150, 104439. https://doi.org/10.1016/j.resconrec.2019.104439.

Sinha, P.; Dissanayke, D.G.K.; Abeysooriya, R.P.; Bulathgama, B.H.N., 2022. Addressing post-consumer textile waste in developing economies. Journal of the Textile Institute, v. 113, (9), 1887-1907. https://doi.org/10.1080/00405000.2021.1954428.

Solis, M.; Huygens, D.; Tonini, D.; Astrup, T.F., 2024. Management of textile waste in Europe: An environmental and a socio-economic assessment of current and future scenarios. Resources, Conservation and Recycling, v. 207, 107693. https://doi.org/10.1016/j.resconrec.2024.107693.

Staicu, D., 2019. Contributions of social entrepreneurship to textile waste prevention in Romania. In: Proceedings of the International Conference on Business Excellence. Sciendo, pp. 84-99. https://doi.org/10.2478/picbe-2019-0009.

Staicu, D.; Pop, O., 2018. Mapping the interactions between the stakeholders of the circular economy ecosystem applied to the textile and apparel sector in Romania. Management & Marketing, v. 13, (4), 1190-1209. https://doi.org/10.2478/mmcks-2018-0031.

Stanescu, M.D., 2021. The state of the art of post-consumer textile waste recycling to achieve the zero waste milestone. Environmental Science and Pollution Research, v. 28, (12), 14253-14270. https://doi.org/10.1007/s11356-021-12416-9.

Tang, K.H.D., 2023. State of the art in textile waste management: a review. Textiles, v. 3, (4), 454-467. https://doi.org/10.3390/textiles3040027.

Teixeira, T.G.B.; Medeiros, J.F.; Kolling, C.; Ribeiro, J.L.D.; Morea, D., 2023. Redesign in the textile industry: Proposal of a methodology for the insertion of circular thinking in product development processes. Journal of Cleaner Production, v. 397, 136588. https://doi.org/10.1016/j.jclepro.2023.136588.

Thomas, K.; Durrani, H.; Brady, J.; Ludwig, K.; Yatvitskiy, M. et al., 2024. Fundamental challenges and opportunities for textile circularity. Sustainability, v. 16, (24), 11117. https://doi.org/10.3390/su162411117.

Tranfield, D.; Denyer, D.; Smart, P., 2003. Towards a methodology for developing evidence-informed management knowledge by means of systematic review. British Journal of Management, v. 14, (3), 207-222. https://doi.org/10.1111/1467-8551.00375.

Vehmas, K.; Raudaskoski, A.; Heikkilä, P.; Harlin, A.; Mensonen, A., 2018. Consumer attitudes and communication in circular fashion. Journal of Fashion Marketing and Management, v. 22, (3), 286-300. https://doi.org/10.1108/JFMM-08-2017-0079.

Yadav, V.S.; Majumdar, A., 2024. Mitigating the barriers of industrial symbiosis for waste management: An integrated decision-making framework for the textile and clothing industry. Waste Management & Research, v. 42, (7), 544-555. https://doi.org/10.1177/0734242X231197367.