



Review

Circularity, Garment Durability, and Just Transition: Understanding the Trinary Interrelationship through an Integrative Literature Review

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Abstract: Large quantities of second-hand clothing have been exported from the Global North to the Global South in recent decades, placing a heavy social and environmental burden on local communities. Consequently, countries in the Global South are leveraging indigenous craftsmanship through various practices, such as care, repair, and upcycling, to enable durability and extend product life, saving millions of garments from landfills. However, this knowledge is not included in global narratives on durability and the circular economy. Moreover, the Global North dominates the conversation, often leaving out the social dimension and risking a circular transition from achieving important goals such as decent jobs to reducing the unequal distribution of negative environmental and social impacts. This study examines the trinary interrelationship between circularity, garment durability, and just transition through an integrative literature review. The review revealed several key findings. Firstly, the authors posit that garment durability is an ongoing interaction between the garment and its changing environment(s) and user(s), enabling it to move through different life cycles via the practices of care, mending, and repair. Secondly, all three concepts must place people at the heart of the fashion industry to ensure a just and circular transition.

Keywords: circular economy; garment durability; just transition; fashion; second-hand clothing; decolonization; sustainable development; economic inequalities; regional disparities; waste colonialism

1. Introduction

Owing to the rise of fast fashion, which relies on cheap manufacturing, frequent consumption, and short-lived garment lifetimes [1], the average garment usage time has decreased by 36% as compared to that in 2005 [2]. The negative impacts of the fashion industry include over 92 million tons of waste produced per year [3], including yarns, cutting scraps, and rejected garment pieces [4]. Incineration or landfills have been most commonly utilized to manage this waste [4]. Within the current socioeconomic landscape in which the fashion industry has globalized, high-consumption countries, often located in the Global North, have more agency in urban politics than countries that largely produce these goods, often located in the Global South. This results in an uneven distribution of environmental and social consequences [1,5-10], as the waste is often displaced for treatment in marginalized spaces [11]. In 1989, the signatories of the Basel Convention warned about the growing threat to human health and the environment posed by the increased transboundary movement of hazardous and other wastes [12]. However, decades later, waste colonialism practices still exist, and groups of people dominate the land of others for the disposal of their own waste. As this practice most frequently affects the poorest populations (e.g., Black, Indigenous, and People of Color), it is a significant source of inequality [9,13,14]. This is particularly true within the clothing and textile industries, as many countries in the Global North export a large share of their unwanted clothing



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to countries in the Global South, many of which have no collection infrastructure in place [15,16]. This flow of clothing and textiles from the Global North to the Global South is a prime example of waste colonialism.

Figure 1 illustrates the various pathways that a garment can follow in its lifecycle and how these lifecycles differ between the Global North and Global South. There is a lack of reliable, global data on the exact quantities of garments that follow each pathway; however, this figure offers a simple visualization of the current system in a way that allows faults to be identified more easily. Overproduction and overconsumption in the Global North drive the current linear system, where take, make, and waste mainly happen in the Global South. The figure shows that once a garment has reached the end of its first life, a status assigned by the user and not always related to the actual quality of the product [17], it could either be given a second life through reuse or directly end up as waste. In the former option, if not directly sold peer-to-peer, garments end up in sorting centers, where the pieces are sorted based on their quality. What is considered "highest quality" is often only a very small ratio (e.g., in France, this is only 5%) [18]. What is deemed too low-quality is either recycled, downcycled, used for energy recovery locally, or exported worldwide, with countries in the Global South being the main destination [18]. While the current system allows the Global North to export unwanted garments to the Global South, hence the "openings" in the horizontal line that divides the two global hemispheres (Figure 1) and the vertical lines illustrating the waste displacement, the Global South does not have this privilege. Its communities therefore must integrate the imposed goods into their local cycle of reusing and remaking, hence the multiple loops of "reuse and remake" to illustrate these activities. Although the Global South has effectively developed capabilities to upcycle large quantities of clothing and extend the life of garments, the generation of waste is inevitable, as illustrated by the dotted vertical lines. Apart from the portion that is immediately considered waste upon arrival, waste continues to accumulate in local ecosystems over time and keeps increasing over time, as the black volume at the bottom shows. This uneven distribution of environmental and social consequences is apparent in Ghana, the largest global importer of used and second-hand clothing [19]. Fifteen million garments enter the Kantamanto market in Accra every week, of which approximately 40% are directly left as waste and end up being burned in piles around the city, filling dumpsites, clogging gutters, and washing out into the sea [8]. These and similar burdens are borne only by communities in the Global South, reducing the enormous impact of a global system to only a fraction of the actors involved.

Alternative perspectives on waste management are emerging, including those that recognize waste management as the recovery of resources and prevention of environmental impact [4], as is the case in a circular economy (CE). The CE concept has gained prominence throughout the last decade in both political and corporate discourse worldwide [20]. It is the most probable candidate to replace the "sustainable development" buzzword that dominated the post-Brundtland era [15,20]. This is considered a strategic area of innovation for the future development of the textile and clothing sectors [21]. The transformation of the current linear economic system into a circular one offers many opportunities to advance sustainable natural resource use, create closed-loop supply chains, and implement sustainable recycling management [22]. Although the reproduction of dominant ideas represses alternatives [23], most fashion and sustainability strategies emerge from and align with Western ways of producing knowledge [24]. These include CE strategies, primarily led by policymakers such as the European Commission [25,26] and business advocacy bodies such as the Ellen MacArthur Foundation (EMF) [27–31]. Despite further promotion by several national governments, including China, Japan, the UK, France, Canada, the Netherlands, Sweden, and Finland, as well as by several businesses worldwide, the CE appears to be a collection of vague and separate ideas from several fields with superficial and unorganized scientific content [32].

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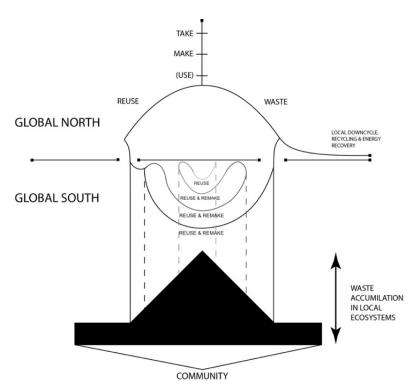


Figure 1. Lifecycles of new and second-hand clothing in the Global North and Global South.

Necessarily, various critical strands that question the value frameworks have arisen in the academic literature, which underpin the narrative of the CE, such as its applicability to global supply chains, as is the case for the fashion industry, which bases its viability and profitability on the immense disparity of labor and environmental regulations across the Global North and South [20,21]. It is questionable whether a "circular" future that does not center on the principles of environmental and social justice is desirable [33–36]. Particularly marginalized and disenfranchised groups, including informal, female, and migrant workers, are overrepresented in value chain segments that are likely to expand in a more circular system (e.g., recycling and logistics) [37]. As illustrated in Figure 1, local communities in the Global South find themselves at the bottom of the global system. In this position, they are forced to carry a substantial social and environmental burden. "Just transition" places workers and community members at the heart of the discussion [38]. Although its principles and considerations are equally relevant for the transition to a CE, the concept has hitherto only been applied in the context of low- and zero-carbon transitions [21,37]. Research [39] points out that methodologies to measure environmental and social impacts remain strictly divided and are often developed within a decade of each other. While the Environmental Action Programme was launched in 1973 [40], the EU has only recently launched its "Just Transition Mechanism" to address the social and economic effects of the transition. It focuses on regions, industries, and workers who face the greatest challenges [41], just as it funds dedicated research projects on its intersection with circularity [42]. However, this has not yet led to the large scale operational implementation of its principles.

As the principles of the CE are directly related to more efficient utilization of resources [43], increasing product durability [2,44] aligns with this vision and is integral to sustainable development [45]. Research has shown that increasing garment use has the least impact on global warming [43] if it implies a reduction in production and consumption levels [46]. While producing new and longer-lasting clothes has been proposed to counteract the disposability of garments [2], manufacturing high-quality items is not the only way to increase clothing utilization, as clothes are already piled up waiting to be worn [46,47]. The "New Textiles Economy" strategy by the EMF considers "transform[ing]

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the way clothes are designed, sold, and used" to be a key pillar to help break garments and textiles free from their increasingly disposable nature [2,15]. A growing number of research projects are contributing to our understanding of how garments are appropriately durable [48]. This includes a previous article by the authors that defined durability as the ability of a product to withstand changes caused by the environment in both intrinsic and extrinsic dimensions [49]. Intrinsic changes refer to wear and tear and material decay, whereas extrinsic changes refer to external changes that influence user preference. With a growing interest in a circular transition for the fashion industry, durability has become part of the global narrative [2,6,38,40,42,43]; however, the majority of attention given to this issue has been from a Western perspective and has been criticized for being shortsighted; specifically, Western scholarship not only lacks non-Western perspectives but distinctly fails to consider the human dimension in CE strategies. Thus, the distinct lack of consideration for the human dimension in CE strategies has been questioned.

Although the introduction illustrates that the three concepts, circularity, garment durability, and just transition, are heavily intertwined, there is a significant gap in the current scientific literature in terms of the intersection of these concepts, although studies in different fields have shown the value of doing so [25]. Therefore, the objectives of this study are to examine the binary interrelationships between them and address the trinary interrelationship. In this way, the study will contribute to a deeper understanding of how the interrelationship of these three concepts determines the interactions between the Global North and the Global South, considering the global context in which the fashion industry's fragmented supply chain is located. From this perspective, an integrative review would inform the development of this emerging topic by providing an initial understanding of it [50]. The following research questions were posed: (1) What is the binary interrelationship between circularity and garment durability? (2) circularity and just transition? (3) garment durability and just transition? and (4) What is the trinary interrelationship among circularity, garment durability, and just transition? The study seeks not only to understand how negative environmental and social impacts are perpetuated (see Figure 1) but also to describe a possible better system that distributes burdens equally between communities in the two global hemispheres. In this way, the findings will certainly contribute to ongoing conversations about the transformation of the sector. It is conceivable that they will be used at different levels of the ecosystem, such as industry, policymakers, and academia, opening different pathways for advancing research to enable implementation in industry.

The remainder of this paper is organized as follows: in Section 2, the key terms of the article—circularity, garment durability, and just transition—are defined together with the Global North, Global South, and waste colonialism to understand the global context. Section 3 specifies the materials and methods used to study the binary interrelationships among the core concepts that are then discussed in Section 4. These core concepts are circularity and garment durability; circularity; garment durability; and just transition. In Section 5, the findings are discussed, while integrally describing the trinary interrelationship and equally specifying the limitations of the study. Finally, Section 6 gives the conclusion of the study and future research directions.

2. Defining the Key Concepts and Global Context

2.1. Key Concepts

First, this section will define the key concepts: circularity, garment durability, and just transition. Second, it will equally define the Global North, the Global South, and Waste Colonialism. The latter are relevant in the global context in which the fashion industry's fragmented supply chain occurs.

2.1.1. Circularity

An extensive literature review by [3] provides evidence that CEs are mainly rooted in ecological and environmental economics and industrial ecology, with the ultimate goal of decoupling environmental pressure from economic growth. CE aims to maintain the value

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of materials in closed-loop systems to replace the current linear economy of take-make-waste [4,51]. As illustrated in the introduction, the narrative has been dominated by certain policymakers, such as the European Commission [23,24] and business advocacy bodies such as the EMF [22–26]. The latter defines the concept as an industrial economy that is restorative or regenerative by value and design [52] and has created adapted guidelines for the fashion and textile industries specifically [2,16,53–55].

2.1.2. Garment Durability

The authors previously conducted an extensive systematic literature review on the different dimensions of durability to confirm the need for a collective understanding of the frequently used term "durability" and its different dimensions [49]. Using a self-developed analytical framework, 162 articles were screened to evaluate their meaning, considering their intrinsic and extrinsic dimensions throughout the complete product lifecycle. The analysis led to the following definition: the durability of a product is its ability to withstand changes caused by the environment in both intrinsic and extrinsic dimensions. Intrinsic refers to wear, tears, and material decay, whereas extrinsic refers to external changes that influence user preferences.

2.1.3. Just Transition

"Just Transition" is a principle, process, and practice. Its principle is that a healthy economy and a clean environment can and should coexist. The process of achieving this vision should be fair and not cost workers or community residents their health, environment, jobs, or economic assets [38]. The term and the concept of "just transition" bring together concerns about social justice in the transition to a sustainable economy and society [21]. Although the concept is relatively new to fashion, it was already used in the 1960s by trade unions in North America. It was then formalized at the 1997 Kyoto Conference by the International Trade Union Confederation and was widely adopted beyond the energy sector from 2010 onward [56]. This concept is an integral part of the Paris Agreement [57], further increasing its salience on the international agenda. The meaning and use of transitions have expanded to include broader efforts to promote jobs, sectors, and economies that are environmentally and socially sustainable [21].

2.2. Global Context

2.2.1. Global Hemisphere: The Global North and Global South

Throughout the article, the terms "Global North" and "Global South" are used. The term Global North refers to countries concentrated in the Northern Hemisphere, such as Haiti, which are often but not always characterized by high levels of income and have often benefited from colonization. The term Global South refers to countries located in the Southern Hemisphere with generally but not always (e.g., Australia) low levels of income and often a history of colonialism. Multiple references [9,58–60] have been consulted to form the above definitions, the aim of which was to erase any notion that could be condescending and further enhance postcolonial dynamics using Western standards as the global norm (e.g., highly developed infrastructure in the Global North versus unstable structures in the Global South).

2.2.2. Waste Colonialism

In the past, waste management was considered simply a way to remove waste materials through landfills or incineration [4]. However, when land and its communities are dominated by another group through waste disposal, waste colonialism occurs [14]. This term was first recorded in 1989 at the United Nations Environmental Programme Basel Convention, where African nations expressed concerns about the dumping of hazardous waste by high-GDP countries into low-GDP countries [12,14,61]. The Basel Convention stressed the growing threat to human health and the environment posed by the increased generation, complexity, and transboundary movement of hazardous and other wastes. It

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came into effect in 1992 and is the most comprehensive global environmental agreement on hazardous and other wastes, with 181 signatory parties [12]. In recent years, the term has gained recognition in the fashion industry, particularly regarding the global trade in second-hand clothing [14,62].

3. Materials and Methods

3.1. Research Methodology

The objective of this research is to evaluate the binary interrelationships between circularity and garment durability, circularity and just transition, and garment durability and just transition, as well as the trinary interrelationship between the three concepts. The authors adopted a method developed by Alcayaga et al. [61], who opted for an integrative literature review to capture the diversity and evolution of more than one body of literature. Although they covered a different topic, they also worked with existing literature that had offered insights in isolated ways or considered only partial overlaps. The lack of a holistic account of the interplay was equally apparent. Therefore, an integrative review can synthesize literature from various domains to describe the interrelationships among these three concepts [63].

First, a selection of publications for the three main bodies of literature was consulted to define the core concepts and equally the Global North, Global South, and Waste Colonialism, which reflect the global context the fashion industry's fragmented supply chain is part of and should be included, as illustrated in the introduction. These publications covered a wide range of relevant studies on these topics. They were used to select keywords (see Table 1) per core concept to perform a targeted search of representative literature. These were executed on scientific databases such as Google Scholar, Science Direct, Scopus, and Springer. The additional search for gray literature, targeting reports, white papers, newspapers, online articles, and books, was conducted using Google's search engine [25].

Table 1. Key words and	l associated	terms f	or searches.
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Circularity	Garment Durability	Just Transition
Circular Non-linear Closed-loop	Longevity Quality Long-lasting Resilience Mending Repair	Environmental justice Intersectional environmentalism Social impact

Finally, the titles and abstracts were scrutinized to identify the most representative studies. Gray literature, targeting reports, white papers, newspapers, online articles, and books were selected according to the following criteria:

- Provide means to understand and define circularity, garment durability, or a just transition, considering the terms associated with the global context, the Global North, the Global South, and waste colonialism.
- Provide a means to understand the binary interrelationships among the key concepts
 of circularity, garment durability, and just transition (research questions one, two,
 and three).
- Provide a means to understand the trinary interrelationships among the key concepts
 of circularity, garment durability, and just transition (research question four).
- Help define a research agenda for future work.

This resulted in a selection of 78 publications, including books (13 items), gray literature (22 items), journal articles (25 items), and online articles (18 items) [64]. Although various types of sources were considered, in line with the chosen research methodology, the majority of sources selected were scientific articles and grey literature (47 out of 78 items).

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3.2. Authors' Positionality Statement

Vanacker, Lemieux, Bonnier, Yost, and Poupard, who all identify as cisgender white women and live and work in the Global North, acknowledge that their privileges are linked to some aspects of their identity. When an identity aspect, of which the "big eight" are age, ability, race, ethnicity, gender, sexual orientation, socioeconomic status, and religion [65], is assigned a higher value in society, those who possess it are more likely to hold power both individually and as a group. This is known as privilege, which is a set of unearned advantages, positive perceptions, and outcomes based on identity [4]. The authors' abilities, race, ethnicity, sexual orientation, and socioeconomic status facilitated access to high-quality educational and professional institutions. Although the authors aimed to adopt a humble approach [66], they recognized the limitations of their abilities for deep decolonial work. Remember that allyship can be a verb, not just a noun, and that it is a journey of listening, learning, taking feedback, and allowing others to lead the way [4]. To avoid a postcolonial approach to scientific research, which it risks, the authors became familiar with projects such as JUST2CE [42] while learning from Climate Justice, Indigenous knowledge, and Intersectional Environmentalism through books, essays, and (online) articles. Some of these sources are Atmos Earth [67], Braiding Sweetgrass [68], the work of the Climate Justice Alliance [69], the Combahee River Collective [70], the Indigenous Principles of Just Transition [71], the Intersectional Environmentalist [72], and The Slow Factory [73].

4. Reviewing Binary Interrelationships between Key Concepts

In this section, the binary interrelationships among the core concepts, circularity and garment durability, circularity and just transition, and garment durability and just transition, are described.

4.1. Circularity and Garment Durability

Product durability, specifically for garments, is a core pillar of the globally accepted CE strategy [2,74], as it allows items to be continuously recirculated and have extended lifetimes. Although studies have shown that increasing garment use has the lowest global warming impact [43], expending resources and effort to extend the life of products pays few dividends unless users make use of the utility provided by long-life products and subsequently change their patterns of consumption [49]. While making things last is often seen as rational, clothing durability is not the only product of the logical mind [24]. It is influenced by the culture and values of the communities to which wearers belong, and it is diverse, heterogeneous, and exists in all contexts [24]. The overconsumption of clothing in linear take-make-waste systems in the Global North [75] is linked to the inverse relationship between garment utilization and production levels [46]. The consequent increase in the export of second-hand clothes from the Global North to the Global South [75] made upcycling of imported waste necessary for communities in the Global South to provide alternatives to overpriced clothing [76]. Throughout history, clothes have been regularly thrashed, unpicked, resewn, rejuvenated, reconditioned, cut, repurposed, revived, worn, and remade [77]. Care and repair of clothing often fall on women as a domestic responsibility, who commonly share this durability knowledge among females across different generations [48]. Unfortunately, rather than celebrating the creativity and craft of maintenance, there has always been a focus on the shame of poverty and need [77], a belief that has only strengthened with the growing desirability and taste of tailored Western-style clothing [1,24,78]. These tendencies accelerate the loss of skills and abilities that have been honed for millennia and result not only in cultural loss but also in other implications, such as any loss to the overall ecosystem [77].

In contrast to some studies claiming that CEs are largely nonexistent [79], many African designers, tailors, and entrepreneurs are leading the way in circular fashion skills and business models, despite not always practicing this under the banner of CE [53]. In Zambia, people have dealt with garments "from the West" for such a long time that the resulting clothing practices must be recognized as their own [78]. Utility infrastructure for

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clothing care and maintenance and the requirements for durable clothing are universally present [24]. Ghana's Kantamanto market is the largest resale and upcycling economy in the world. They successfully recirculate at least twenty-five million garments every month [80] without any cutting-edge technological infrastructure or financial investment. The community employs omnipresent know-how and skills among designers, tailors, upcyclers, and other entrepreneurs who design, make, remake, and repair clothes daily.

Despite the substantial value of local wisdom and agility in dealing with imported waste, sustainability strategies, including CE and garment durability strategies, emerge from and must still align with Western ways of producing knowledge [24]. Most studies have only made recommendations on extending the physical lifetime of a product to maintain it [49], although ethnographic evidence shows that garments that defy obsolescence do so in informal or unintentional ways and rarely as a result of design planning or material or product qualities [49]. This further challenges the strong focus on physical durability that is perpetuated by the Global North and its integration into the Product Environmental Footprint of Apparel and Footwear [81] that the European Commission is currently developing. This does not consider the full complexity of the concept of durability and thus is a potential area for progress.

Based on this, the binary interrelationship between circularity and garment durability can be described as follows: Garment durability is a core pillar of circularity because it enables different life cycles and thus long product lifespans. Although investing efforts in improving intrinsic durability can have the lowest global warming impact, they should be accompanied by changed consumption patterns that favor circular practices, such as repair and reuse, over the purchase and, thus, production of new items. This emphasis on integrating changed consumption patterns and circular practices highlights the importance of considering the extrinsic dimensions as well, which are often on a societal, as opposed to a product, level.

4.2. Circularity and Just Transition

While many different definitions of CE exist [82], the most prominent one [20] has been provided by the EMF [27], according to which a CE is restorative and regenerative by design and provides benefits for business, society, and the environment. This vision is accepted and implemented by many industry players, from fast fashion to luxury brands [83–86]. Countries in the Global South are in many ways more "circular" than their counterparts in the Global North. Although there is growing optimism about the potential of CE as a new model for sustainable growth in the Global South [87], how CE proponents expect to restructure colonial and postcolonial links between rich and poor countries is a neglected topic [20]. The roles of people, class relations, power asymmetries, indigenous people, women, plants, and animals are generally overlooked [21] as social, cultural, political, and even environmental aspects are subordinated to economic factors, such as competitiveness and growth [20]. It is noteworthy that garment workers are largely overlooked in a New Textiles Economy [2], and although their abuse is highlighted in the current status of the industry, it has not been adequately addressed within the CE vision [88]. However, without addressing the human and social dimensions of the transition, CE will not deliver important social goals, such as improved health, decent working conditions, and reduced inequality [89]. Circular roles are likely to be more multifunctional and technology-intensive, entailing a strong risk of perpetuating existing job quality concerns, such as low wages, excessive overtime, and harassment [37]. For example, research from Tranberg Hansen in Zambia [78] shows that clothes imported from charitable organizations are often sorted under poor work conditions by poorly paid workers, some of whom are recent immigrants from countries where clothes are sold.

The transition to a CE must be a just transition [90]. In response, different studies have investigated the intersection of a just transition and CE [21,33,37,42,66,89,90] to critically and thoughtfully understand the conditions under which a responsible, inclusive, and socially just circular transition is possible and desirable [42]. Doing so is important for

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identifying the countries, sectors, communities, and workforce that may be adversely affected by the process [21], considering the needs and concerns of various stakeholders. Inclusive CE initiatives demonstrate that addressing the environmental issues of waste can go hand-in-hand with social objectives to reduce gender inequality, improve education and health, and generate new employment opportunities for women [21].

Based on this, the binary interrelationship between circularity and just transition can be described as follows: Including the principles of a just transition, which believe that a healthy economy and clean environment can coexist without negatively impacting workers and community members, is vital in the circular transition to avoid the repetition of negative patterns present in the current linear system. Therefore, CE must look beyond recycling, waste management, and technological "fixes" and consider a social transformation [33].

4.3. Garment Durability and Just Transition

Clothing durability, which is a heterogeneous concept, should not be treated as a standalone issue, as is typical of mechanistic and reductionist thinking [24]. Its overlap with the concept of just transition opens the dialog and broadens an otherwise narrow perspective. It humanizes what is otherwise considered a purely technocratic concept. The term "durability" serves as an umbrella term in the Global North for many different human practices such as repairing, mending, altering, restoring, reviving, rejuvenating, mending, and repurposing [77] that are widely used in the Global South.

By exploring the plurality of ways in which durability is thought about and practiced, Fletcher and Fitzpatrick [24] examined its interrelationship with just transition. They conducted semi-structured interviews with participants from outside the Global North to develop 14 features for the durability of decentering clothing. Besides conventional "care", "infrastructure", and "garment design", researchers claim that the "body", "colonial legacy", "durability", and "gender", "myths and stories", "place", "political economy", "pride and guilt", and "temporalities" represent the plural and intersectional nature of durability.

During colonization, the principles of just transition, that a healthy economy and clean environment can and should coexist without costing workers or community residents their health, environment, jobs, or economic assets [51], were dishonored, and this directly negatively affected durability. Andean weaving illustrates this, as it was a practice symbolizing indigenous resistance to domination, knowing that the Spanish consciously forced local communities to produce low-quality textiles [91]. This aligns with the identification of "colonial legacy" as one of the 14 durability features [24]. Colonial legacies even continue today in Ghana, where almost half of the imported second-hand clothing comes from the United Kingdom, its former colonizing country [19].

As many countries in the Global South have to deal with these low-quality garments, there has been a drastic decline in the demand for local handmade textiles [14,92]. This trend is counterbalanced by the durability of "myths and stories", which can positively impact the lifespan of garments. For example, the Ghanese Adinkra stamp designs printed on cloth are referred to as proverbs that are marks of wisdom and cultural knowledge in Asante culture [93,94]. With the introduction of new symbols and designs, Adinkra has become a dynamic phenomenon that lives from generation to generation [95]. These durability practices are also present in Japan, where wear and tear are not considered undesirable, despite the fact that this is often the case in other cultures [49]. Traditional Japanese techniques often value the signs of aging. For example, Kintsugi is an art form that dates to the 15th century and involves repairing broken pottery in ways that honor and emphasize cracks. It has its roots in two integral concepts, "Mottaini", the regret one feels when anything goes to waste, and "Mushin", the importance of accepting change [96]. Sashiko is a traditional Japanese embroidery style mostly used by the working class to create stronger and more practical workwear [97]. Boro is the result of Sashiko's actions; it is the repair achieved by stitching fabrics over or together with a needle and thread to repair or decorate [98]. Valuing longevity is an inherent part of some cultures; for

example, the Jewish value "I'dor v'dor", which directly translates to "from generation to generation" [99]. In Nigeria, the handmade traditional "Agbada" robes have become family heirlooms passed on from father to son. The embroidery present in these robes is thought to have both protective and practical functions, as it strengthens the pockets and neck of the gown [92]. The indigenous women of Panama, known as Kuna, produce and wear "Molas". This mending technique, also known as "reverse applique", is handmade with very high-quality and longevity [100–102], making it a desirable textile.

While the above-mentioned practices strongly differ based on the local practices of different communities, this brief introduction highlights that they all share the common goal of extending the lives of garments and textiles. They emerge from the culturally embedded wisdom of thrift, domestic provisioning, and care for loved ones [48], generating employment mainly across the informal sector [53]. This "tacit knowledge" refers to the wisdom, skills, and abilities an individual gains through experience and is often difficult to put into words or communicate otherwise [103]. This is one reason why, in most cases, the craft of use falls outside industrial or commercial ideas about sustainability. There should be a call for solutions with local, regional, national, and global solidarity [38], for which technology can help create scalable solutions if guided by traditional ecological knowledge [96].

Based on this, the binary interrelationship between garment durability and just transition can be described as follows: As the various durability-enabling practices are based on the indigenous know-how of communities, any durability strategies should put people at the heart, as the just transition principles plead for. This highlights the relevance of stepping away from a solely technocratic approach to avoid a myopic view, which could hinder the just transition towards circularity by only focusing on the intrinsic dimension.

5. Discussion

This article aimed to understand the trinary interrelationship between circularity, garment durability, and just transition. Through an integrative literature review, of which the precise research methodology is detailed in Section 3, the authors were able to address the diversity of emerging topics by reviewing more than one strand of literature. In light of the findings, there are several implications to consider.

First, with regard to durability, the holistic conceptualization and synthesis of the existing literature through an integrative literature review contributed to a deeper understanding of garment durability [49]. On this basis, a revised definition of durability can be formulated that goes beyond the one presented in Section 2. The authors posit that garment durability is an ongoing interaction between the garment and its changing environment(s) and user(s), enabling it to move through different life cycles via the practices of care, mending, and repair.

Second, the binary interrelationships of circularity, garment durability, and just transition were investigated to answer research questions one, two, and three. This highlighted the current research focus on the interplay between circularity and durability [2,49,53,77,83,84,86]. As circularity is a highly popularized concept, literature is widely available in various research streams, which often mentions "durability" or "products that last" as a key pillar for it. More recently, interest in the intersection of circularity and just transition has increased, notably with the idea of working towards a "just circular transition" [5,10,21,33,36,66,89,90]. However, research shows [39] that the consideration of social impacts lags behind that of environmental impacts, and implementation on a large scale is not yet present. The third interrelationship, between garment durability and just transition, is the least explored in current research, with only a single study focusing on this topic [24]. Figure 2 illustrates the representation of the key concepts and their binary interrelationships in the selected literature.

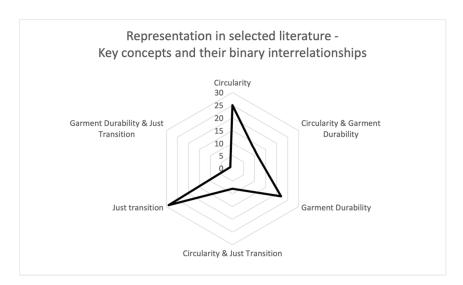


Figure 2. Representation in selected literature: key concepts and their binary interrelationships.

To address this gap in the current literature, the authors used the clear definition of each concept developed in Section 2 to further explore the three binary interrelationships by reviewing research in various formats focusing on circularity, garment durability, and/or just transition. In all three cases, the authors found that the human aspect was insufficiently considered, leading to an overall short-sighted view that does not consider the multifunctional and technology-intensive nature of circular roles. Due to this myopic view, existing concerns about job quality, such as low wages, excessive overtime, and harassment, will not be tackled in a circular transition [35]. With regard to the binary relationship between garment durability and just transition, the authors argue for the inclusion of practices that enhance durability and are based on ever-evolving indigenous know-how in order to move away from the current technocratic approach used in the global CE narrative.

Third, the authors wish to answer the fourth and final research question: What is the trinary interrelationship between circularity, garment durability, and just transition? As the findings of exploring the binary interrelationships already highlighted, people are often poorly considered or not considered at all. This is well illustrated in Figure 1, with the "community" as an external factor, outside and at the bottom of the system. Contradictory research shows how people should actually be put at the heart of everything [37,71,89]. While Figure 1 illustrates the current situation, Figure 3 aims to go a step further and visualize what a system that includes global communities could look like. It eradicates the strict boundary between the Global North and the Global South, as well as the idea that there is a top and bottom in the system. While resources are still taken to make products, this happens proportionally without the overexploitation of a particular global hemisphere. Furthermore, products enter various cycles of use, reuse, and possibly remaking and have constant interactions with people, who are at the heart of the system, to enable this. What eventually goes to waste does not disproportionally affect communities in the Global South, as is currently the case, but is handled locally and minimized by optimal reuse and remaking. Eventually decreasing the need to use new resources, as the loops of remake are bigger than those of creating products from virgin materials.

This has led the researchers to describe the trinary interrelationship of the three core concepts as follows: The common thread between CE, garment durability, and just transition is people. Durability-enhancing practices, found primarily in informal economies and relying on community-specific tacit knowledge, effectively extend garment lifespans. Humanizing otherwise technocratic concepts underscores the importance of the social dimension in achieving the goals of CE, such as creating decent jobs and reducing the unequal distribution of negative environmental and social impacts. While these innovative techniques need to be incorporated into global narratives about CE and durability, there is a danger of romanticizing them. Recognizing the vast amounts of second-hand clothing that

communities in the Global South must deal with is crucial to ensuring a just and circular transition in the fashion industry. Therefore, it is necessary to address the overconsumption in the Global North and the resulting negative environmental and social consequences of the overproduction happening in the Global South, where these garments usually end up at the end of their lives. This could be accomplished, for example, through globally accountable Extended Producer Responsibility (EPR) legislation.

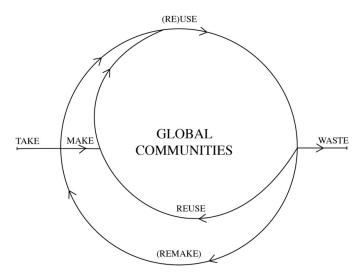


Figure 3. Visualization of what a system that puts people at its heart could look like.

Limitations

Nevertheless, this study has some limitations. First, the authors were limited in their performance of deep decolonial work because of the granted, unearned advantages that they have based on some aspects of their own identities. Despite the ongoing and iterative process of relearning combined with critical thinking, equally valid perspectives have fallen outside the research scope. Tacit knowledge is usually not available in written form, let alone in English or French, which increases the risk of exclusion. Second, the study showed the high value of tacit knowledge regarding durability practices, which could not be captured in the literature review due to their nature. Third, including only English literature is an additional limitation that keeps relevant knowledge out of scope.

6. Conclusions

Most of the currently available literature draws attention to the interrelationship between circularity and durability. Consequently, these two concepts have received the most institutional and industry recognition in recent years. However, the approach is mostly technical and corresponds to the Western way of creating knowledge, which has led to a critical review in recent years. By choosing an integrative literature review for the research methodology, this study has countered this myopic view, especially by including the concept of just transition on an equal footing. Although the principles of this concept are not new, they have only gained recognition in recent years, most recently in the context of the fashion industry. The inclusion of just transition in the study resulted in an adapted definition of garment durability based on previous work by the authors on this topic. It defines durability as an ongoing interaction between the garment, its changing environment(s), and its user(s) that allows it to go through different life cycles through the practices of care, mending, and repair. The study not only redefined garment durability but also led to a description of the trinary interrelationship between concepts and a corresponding visualization (Figure 3). It shows how the inclusion of global communities at the center of the system can lead to an equal distribution of environmental and social burdens that have already been greatly reduced in a more circular system through the continuous reuse of existing garments and resources. This requires addressing the current

culture of overconsumption in the Global North, fueled by the overproduction of goods that are often outsourced to the Global South.

Future Research Directions

Future research should focus on developing a better understanding of durability practices in the Global South through the direct testimonies of players from the informal economies. This will also allow the integration of tacit knowledge that is specifically difficult to transmit or otherwise communicate because it is not written down. For this, the authors envision that an intervention and action research methodology could be used in conjunction with local communities and organizations so that a durable and just exchange can take place. Secondly, based on the holistic understanding of garment durability within a just circular transition, it can be further explored how the intrinsic and extrinsic dimensions of durability could be measured and if doing so is relevant. Based on the revised definition of durability, this should take changing environments and users into consideration, also touching on how these affect interactions with the garment. Thirdly, the role of the three concepts and their interrelationship, in upcoming legislation, like the Product Environmental Footprint for Apparel and Footwear, should be further explored. This focus on waste management and EPR legislation would inform the development of a more just system in the future.

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