

Reimagining Circular Fashion: Crafts' Role in Sustainable Development

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Abstract: *The circular economy aims to minimize waste through the reuse, repair, and recycling of resources. This study explores two strategies for achieving circularity: slowing resource loops by designing durable products and closing loops through recycling and disassembly. It highlights the vital connection between circular fashion and traditional Indian crafts, which are often sustainable yet threatened by mass production. By promoting longevity and reducing waste, traditional crafts contribute significantly to the circular economy. The study advocates for collaboration among designers, artisans, and consumers to foster a sustainable fashion ecosystem that values craftsmanship while addressing environmental challenges. Embracing these principles allows the fashion industry to transition from a linear model to a circular one, benefiting both people and the planet through more responsible production and consumption practices.*

Keywords: Circular fashion, Circular product Design Strategies, Traditional Crafts

1. Introduction

Fashion is one of the most resource-intensive industries, with extraordinarily complex global supply chain networks and quick cycles of production and consumption processes. Hur et al. (2019). The fashion business is at the second position in creating pollution, worldwide, and its carbon emissions are larger than all maritime transportation and international flights combined, instigating serious social and environmental impacts in its supply chain. Hugo et al. (2021). Since it is one of the most environmentally harmful industries, it has faced continuous pressure to transition from a linear economic model to a circular economy (CE) model. A linear economy is a traditional economic model where goods are produced, used, and then thrown away. It follows a simple process: take, make, use, dispose. Today, the "single-use" style of life has transformed the planet into a "take-make-use-dispose" environment. The classic linear economic model has come under fire for its negative effects on the economy, the environment, and people. The circular economy (CE) has been the most recent effort to moderate the risks associated with the linear economy (LE) (Mishra et al. (2021).

1.1 Circular Economy

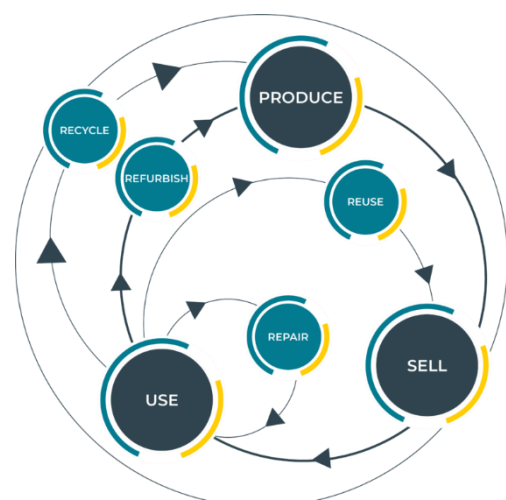
CE is a term used for defining a closed loop system. It "aims to overcome the take-make-dispose linear pattern of production and consumption, proposing a circular system in which the value of products, materials, and resources is maintained in the economy for as long as it is possible" (Merli et al, 2018). Circularity refers to the concept of a closed-loop system where resources are kept in use for as long as possible, waste is minimized, and natural systems are regenerated. In a circular system, the end of the product's life cycle is not the end of its usefulness.

The CE is an economic system that aims to alter the traditional linear economy and is regarded as a possible enabler of sustainable development. CE is defined as "an industrial system that is restorative or regenerative by intention and

design". It substitutes the concept of end-of-life with restoration, transitioning products and materials from 'cradle to grave' to 'cradle to cradle'. That is, CE regards discarded items or components as commodities and resources for the use in future manufacturing processes (Chong - Wen Chen, (2020)

In a Circular Economy, the goal is to keep resources in use for as long as possible, extracting the maximum value from them while in use, and then recovering and regenerating products and materials at the end of their service life.

Since it is necessary for the fashion business to become sustainable, circular economy principles must be implemented. The circular economy in fashion symbolizes a paradigm shift in how the industry runs, moving away from the conventional linear model of "take, make, dispose" and toward a more regenerative and sustainable framework. Its goals include extending the lifecycle of products, minimizing waste, and fostering the regeneration of natural systems. To accomplish this circular fashion come in to existence.



Picture Credit: <https://www.ecoveritas.com/circular-economy/>

1.2 Circular Fashion

Circular Fashion refers to an approach within the fashion industry that tries to establish a closed - loop system that reduces waste while increasing the lifespan of garments and materials. It connects with Circular Economy concepts by rethinking how clothing is designed, manufactured, used, and disposed of. The fashion industry is one of the largest waste generators, generating significant amounts of waste, emitting greenhouse gases, and contaminating water. Key aspects of circular fashion include:

- 1) **Design for Longevity and Durability:** Garments are designed to be durable, timeless, and high quality, encouraging longer lifespans and reducing the need for frequent replacements.
- 2) **Materials and Production Methods:** Emphasis is placed on using sustainable and eco - friendly materials, incorporating recycled or upcycled fabrics, and employing production methods that minimize waste and environmental impact.
- 3) **Extended Use and Reuse:** Circular fashion encourages clothing rental, resale markets (such as second - hand stores or online platforms), and clothing swaps to extend the life of garments beyond a single owner's use.
- 4) **Repair, Remake, and Recycling:** Promoting repair services, encouraging consumers to mend or alter garments, and facilitating recycling or upcycling of old clothes into new products are vital elements of circular fashion.
- 5) **Closing The Loop:** Creating systems where garments can be fully recycled or biodegrade at the end of their life cycle, minimizing landfill waste and allowing materials to be reused in new clothing or other products. ([https://www.thesustainablefashionforum.com/pages/what - is - circular - fashion](https://www.thesustainablefashionforum.com/pages/what-is-circular-fashion))

The fashion industry has increasingly leaned towards fast fashion due to several factors like consumer demand for trendy, affordable clothing and the need for quick production cycles. However, this trend raises critical concerns and opportunities for change. One of the major alternatives to this can be moving towards slow fashion.

As the Circular fashion principles emphasize longevity, extended use, reuse, recycling, and close loop system, and fast fashion is the main reason for environmental damage, the craft can be a great option to look forward to.

1.3 Circular Fashion & Craft

Fashion presently relies on fast fashion to generate a higher turnover of designs and patterns in garments and related accessories, whereas crafts encourage a more deliberate and considered approach with culturally identifiable work (Chhajlani, 2021). Closed loops of the circular economy will help the integration of indigenous craft knowledge which is regenerative. The circular economy can be created by amalgamating fashion and craft while creating a sustainable business model. (Chhajlani, 2021).

Fashion designers can lower production costs, lengthen the useful life of their products, and open up new business prospects by applying circular business models by employing circular design practises. Closed loops of the circular

economy will help the integration of indigenous craft knowledge which is regenerative (Chhajlani) Though sustainability and crafts of a region go hand - in hand, craft still have to find its standing in the mainstream fashion world; craft practices have a strong local congruence and knowledge that has been passed down generation - to - generation through oration or written materials (Chhajlani). Yet in recent years, as Wood (2011) notes, this sector faces a major threat as a result of growing preference for mass produced designs that are cheap and easy to afford. This has contributed to the steady decline of craft - based products.

2. Circular Economy and Waste in the Fashion Industry

The apparel sector including manufactures, brands and retailers are facing challenges to introduce new lines more frequently at comparatively lesser prices. Shorter lead times for production have allowed companies like Zara to offer 24 new clothing collections every year to outshine their competitors. Consumers were stimulated not only to expand their wardrobes but also to refresh them rapidly due to the larger variety and dropping prices have. This has resulted in the increased annual production of a large number of garments. The unprecedented growth in production and consumption has resulted in a stark increase in wastages, pollution and carbon emissions. Around 92 million tons of waste is produced by the fashion industry every year and is expected to rise further. The major chunk of textile waste ends up in a landfill or is incinerated (Mishra et al.2020). Implementing circular business models to keep products and materials “in - the loop” for longer, allowing for extended use, repair, reuse, repurposing, and recycling, through the adoption of emerging technical and social innovations can be the choice to reduce the negative impacts of textiles. (Luca et al.2022)

2.1 Linear Approach to Circular Approach

Current Scenario of “single - use” approach to life has made the planet a “take - make - use - dispose” world. (Mishra, et. al, 2020). The CE is an economic system used to transform the traditional linear economy and it has been considered as a potential enabler of sustainable development. (Chen, C. W. (2020). Circular design aims at eliminating waste by prolonging the life of the product or returning material used back to the system for reuse. From a ‘take, make and waste’ industrial model, the circular economy is meant to be restorative and regenerative. This may involve REPAIR, REUSE, RECYCLING OR REPURPOSING to extend the life cycles of products, waste from one process becomes feedstock for another, and minimizing of negative impacts are all part of the practices followed. (Nerurkar, 2018)

2.2 Circular Product Design Strategies Using Slow and Closed Resource Loops

The fashion Businesses transitioning to a circular economy, several product design ideas need to paid attention. Circular product design is a bridge towards a circular economy and calls for a shift in the mindset of designers. In linear economy raw material are transformed into goods and at the end of their functional life are cast away as waste. Circular design aims at

eliminating waste by prolonging the life of the product or returning material used back to the system for reuse (Nerurkar (2018)). The emphasis is on circular product strategies using slow and closed resource loops. Two circular product strategies: (1) Slowing resource loops: Designing long lasting goods and extending the product life are important planks of a slow resource loop. Designing long - life goods through attachment, trust or durability and product - life extension through repair, upgrades, standardization and ease of disassembly results in a slowdown of the flow of resources. (2) Closing resource loops: Managing technical or biological cycles facilitating recycling and the use of disassembly in design helps close the resource loops.

Slowing is about prolonged use and reuse of goods over time, whereas closing loops is about material recycling. The concept of circular product design under a framework of two types of strategies for the technological and biological cycles of the circular economy: “design strategies to slow resource loops” (e. g. designing long - life products, and design for product - life extension) and “design strategies to close resource loops” (e. g. design for a technological cycle, design for a biological cycle, and design for disassembly and reassembly) (Bocken et al., 2015.). In their proposed framework, the levels have been titled ‘Design for a Technical Cycle’ and ‘Design for a Biological Cycle’. ‘Design for a Technical Cycle’ is the technical and/or technological use and transformation of material and energy resources, and their design optimisation to the highest possible levels of efficiency. The aim is to minimise material and energy inputs, and emission outputs throughout the whole life cycle of a product or solution, while maximising the highest value proposition for the user and society. Strategies for the technical cycle are ‘slow the loop strategies’ and ‘close the loop strategies’. ‘Slow the loop strategies’ include slowing material flows in each phase of the life cycle such as design for durability and product life extension (Vezzoli and Manzini, 2008); it also involves more recent developments from the added value user perspective, such as emotionally durable design (Chapman, 2005). ‘Close the loop strategies’ include strategies such as design for recyclability that enables disassembly and appropriate materials selection. “Design for a Biological Cycle” consists of ‘bio - inspired loop strategies’ and ‘bio - based loop strategies’ ‘Bio - inspired loop strategies’ adopt a biomimetic approach and are long established (e. g. Leonardo da Vinci’s study of the wing structure of birds for the design of flying machines) and draw S1624 Ana Mestre, Tim Cooper upon the science of bionics (i. e. the study of natural systems in addressing human engineering problems). ‘Bio - based loop strategies’ aim to utilise biological materials that, at the end of their life cycles, can be returned safely to the biosphere in order to provide nutrients to (micro) biological life. Luca et al, (2022) analyses the following four approaches of circular business models for textiles, which are based on different principles of circular economy and often highlighted in the literature (e. g., Bocken et al.2016): 1) Longevity and durability, 2): Access - based models, 3: Collection and resale, 4): Recycling and reuse of materials. Longevity and durability model approach is focused on extending the lifetime of garments, thus reducing the need for purchasing new items and allowing for various modes of reuse. It is often combined with design for repair,

customized production for promoting emotional product attachment, and offers of repair and maintenance services.

2.3 Design for Longevity

Circular business models based on longevity and durability seek to extend both the quality of garments and their lifespan through longer and multiple uses. Many brands are implementing actions for extending longevity and durability of their garments, for instance by using designs that remain fashionable, building attachment of customers to clothes using e. g., with storytelling linked to support of social initiatives, engaging in environmental projects, and creating personal connections with designers or producers. (Coscime, 2022). Design for longevity addresses two aspects: design for durability and design for long - lasting. In a circular fashion system, products are designed to be durable so that the product life can be extended and consumption can be reduced, which helps slowing the resource loops. Good - quality materials, durable seams and long - lasting dyes that can withstand washing and abrasion are key requirements for product durability. Design for long - lasting considers the consumer emotional attachment to the product (emotional durability) as opposed to disposable fashion. Designing timeless or trans - seasonal fashion can enhance longevity, because those clothing are free from short - term, seasonal trends. Trans - seasonal products extend the use of item beyond one fashion season and can avoid the items being disposed soon. Product longevity has re - emerged in recent years (Cooper et al., 2015), notably in sustainable design discussions. Increased product longevity can be achieved by “intervening at various points in the lifecycle so that products (and their components) are reused, reconditioned or recycled” (Cooper, 1994, p.4). Products can be designed to be physically durable, but also to create an emotional attachment between the consumer and product to keep it in active use for longer at the ‘use’ phase of the product lifecycle (Fletcher, 2007; Gwilt 2014; Gwilt and Rissanen, 2010; Mugge et al.2005; Schifferstein et al.2004). Design for physical durability involves the development and testing of yarns, fabrics and garments to meet specified performance standards that can withstand prolonged wear (Cooper et al.2013), whereas design for emotional durability is more difficult to define and includes a range of approaches to promote fashion collections that are less trend driven, more seasonally adaptable and versatile in terms of fit and styling. These features can influence consumers to approach fashion consumption in a more considered way (Fletcher 2012).

In practice, fashion brands and retailers use multi - disciplinary teams to design, develop and procure products, which encompass the design, technical and commercial buying functions (Goworek 2010). Sustainable design approaches that seek to reduce the environmental impact of materials and manufacturing processes, and increase physical durability are rarely led by the retail designer or design team, but by technical and sourcing experts with specialist knowledge of materials science, textile technology and supply chain management (Cooper et al 2013). However, the concept of enhancing emotional durability to reduce consumption is more design - led and tends to be user - centred, providing an increased opportunity for designers to direct and influence the process (Chapman 2015). A designer has a vital role to play

in designing a product for durability and longevity by incorporating those quality requirements during the product development stage. Clothing can also be designed to adopt changing needs of consumers. Combining traditional craft into contemporary fashion is also a possible way to increase the attachment to product. Customers are willing to pay higher prices for unique, handmade fashion items and tend to keep them longer.

Emotional Attachment & Longevity

Attachment is an emotion - laden target - specific bond between two persons. Similarly, product attachment is defined as the strength of the emotional bond a consumer experiences with a specific product. People may experience relatively strong emotional bonds to their most favourite or special possessions, whereas other products are less significant to them. The object to which a person experiences attachment triggers one's emotions (Mugge, 2008). Expressing the Emotional & physical need of Mature women and explored fashion design for reporting issues with inconsistent sizing on the high street, and frustration at how reoccurring fashion trends were mainly aimed at younger bodies. In order to better understand emotional attachment, it is beneficial to contrast how both mature and young people interpret the emotional durability of their clothing (Townsend, Sadkowska and Sissons (2016). Long ownership time was the consequence of deep meaningful memories embodied into the items (Niinimäki and Armstrong's (2013). When analysing current academic research on the emotional durability of clothing, longevity emerges as a key theme. Longevity is defined as keeping garments in active use for longer (McLaren et al., 2015), and this idea can be linked back to the circular economy debate. Having a sentimental attachment to a garment may mean that the garment is more likely to be looked after, as it would not be easy to replace (Cooper et al., 2013). Schifferstein and Zwartkuis - Pelgrim's 2008 study proposed several design strategies with the aim of intensifying the emotional bond which consumers experience with their products. This included; designing more enjoyable products, developing products that can be used together with other people and designing products which gracefully accumulate signs of history in their appearance (Schifferstein and Zwartkuis - Pelgrim, 2008). Designing classic styles, and using more durable materials can also contribute to extending the active use of clothing (McLaren et al., 2015).

Emotional Attachment Through CRAFT

Circular economy can be created by amalgamating fashion and craft while creating a sustainable business model (Chhajlani). In addition to being sustainable and creating ecologically conscious clothing, brands have embraced the age - old tradition of upcycling from India, carrying a part of the tradition and making garments and accessories that are chic and in - trend. As the Indian fashion industry responds to calls for sustainable fashion innovation, many designers consciously look back to India's rich history of craft to propose solutions for the future. She discussed how through shifting the emphasis towards a model of design for wellbeing, the foundation for which are embedded in many craft - based activities, alternatives for sustainable fashion futures and decolonizing design emerge. She advocated the fact that dress practices and related craft systems in India were inherently sustainable in the past, and that the current fashion

design industry is actively innovating off these older practices or developing new material processes in an attempt to reduce the environmental impact of fashion. The concept of "sustainability through craft" as a viable strategy for decolonizing design and fashion was proposed. She notes that craft practices are not only centered around creating aesthetically pleasing outcomes but emphasize quality and durability, as well as, the design of objects "whose lives are prolonged because people become emotionally attached to them (Sandhu, 2020)

The fashion industry is the one generating change and being the pioneer of integrating slow and circular practices. As valuing craft - based design has become an important part of slow fashion since craft elevates the quality of a product and supports communal production enhance and celebrate social bounds. Craft - based design is a highly challenging phenomenon for the rapidly changing global fashion industry because craft undermines the obsession of novelty and constant change imposed by the conventional fashion system (Clark 2008). It intensifies users' attachment to the products by generating social and cultural meanings (ibid).

3. Discussion

The literature review emphasizes the need for circular fashion principles and emotional durability in resolving the pressing issues raised by quick fashion. Emotional attachment to belongings might lead to longer usage durations, promoting sustainability through a stronger connection between consumers and their possessions. Clothing having sentimental value—those associated with memories, traditions, or special events—are more likely to be cared for and conserved, lowering the need for frequent replacements. Increasing the life span through emotional attachment is the to address the current pressing issue of fast fashion and achieve the goals of circular economy. Circular fashion principles push towards adopting sustainable materials, Design for Longevity and durability, Extended use & reuse, & closed loop systems which take us to the different model and strategies of Circular fashion. Longevity and emotional attachment go hand in hand and develop emotional durability. The idea of "emotional durability" highlights how crucial it is to build deep emotional bonds between customers and goods. Circular product design highlights strategies such as 'slowing resource loops' and 'closing resource loops' to reduce waste and increase product lifecycles. These tactics are completely consistent with the ideas of slow fashion which advocate for creating apparel that is timeless or trans - seasonal and increases longevity since it is not influenced by fads or fads. Concepts of sustainability build on slow fashion, local production, recycling, and reuse.

Within this perspective, traditional crafts emerge as an important source of sustainability. Craft - based designs, with their cultural and emotional relevance, can combat the disposable mentality of quick fashion by encouraging individuality, quality, and a feeling of legacy. This combination of craft and sustainability is widely acknowledged as a means of achieving circularity in fashion, particularly in India, where traditional crafts are inextricably linked to cultural identity.

Fashion industry has the potential to develop a diverse range of circular business models. Design for circularity should be the centre of focus because it has been identified that around 80% of the environmental impacts are determined by the design stage. The design stage is crucial in achieving circularity in fashion. Clothing can also be designed to adapt changing needs of consumers. Design for circularity focuses on designing the product to be suitable for several life cycles, which is facilitated by the original design. Keeping in mind the reusability component, it becomes essential to safeguard our traditional craft. This emphasizes a sense of timelessness in its look, making handmade products more relevant for many generations to come. Indian crafts are very intricate and rich. People favoured handicrafts in the past because they were considered status symbols.

Brands Working Circular Design Principles

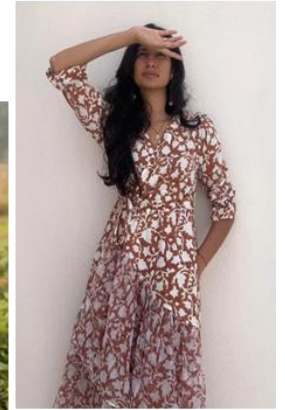
There are many companies working this direction. Few examples have been taken to explain that the fashion industry is moving in this direction.

(A) Doodlage

Doodlage is a company that specializes in transforming factory waste into short, limited - edition collections. They focus on recycling post - consumer waste and cutting scraps to create new fabrics, resulting in season - less garments that are well - finished and designed for longevity. The organization emphasizes sustainability by ensuring that what they consider waste is meticulously segregated and repurposed into accessories, soft furnishings, and packaging materials, including stationery products made from recycled paper. All of Doodlage's pieces and fabrics are produced through ethical manufacturing practices, and their packaging is designed to be plastic - free, reinforcing their commitment to environmental responsibility.

(B) Ka - sha

Heart to Haat is inspired by the indigenous principles of reusing, repurposing, and reclaiming, emerging from a deeper exploration of conscious practices at Ka - Sha, its sister label. Initially conceived as a Zero - Waste initiative in 2012 to manage post - production waste at Ka - Sha, it has evolved into an industry - wide solution addressing textile waste that **cannot be recycled**, providing alternatives for **reuse and repurposing**. All products under the Heart to Haat brand are crafted from production waste, utilizing innovative design techniques to create aesthetically pleasing and functional items, including bags, accessories, and clothing. The organization offers upcycled products and textile waste management solutions for brands, manufacturers, and designers seeking responsible waste management practices. Additionally, they assist in repurposing unwanted textile scraps and other materials into usable products. Heart to Haat also engages with **pre - loved clothing, enhancing, mending, and reimagining** these garments to meet current needs. Ka - Sha has achieved recognition as a registered "Upcycled Textile Manufacturer," certified by the Ministry of Textiles, Government of India.



(A) Rang Sutra (Top Left), Picture Credit: <https://rangsutra.com/collections/women-dresses>, (B) Ka - sha (Top Right), Picture Credit: <https://www.ka-sha.com/collections/all/products/cora-dress>, (C) Doodlage (Bottom Left) Picture Credit: <https://doodlage.in/products/dl24-jk-012-mila-kantha-patchwork-jacket> (D) Maati (bottom Right), Picture Credit: <https://www.maatiynehakabra.com/products/beige-carefree-dress>

(C) Maati:

Maati adopts a sustainable fashion approach, prominently reflected in the natural fiber clothing it promotes. The label utilizes handloom khadi fabric produced by the Ganai Family in West Bengal, which is created with minimal water and no electricity. Additionally, Maati employs upcycled power - loom fabric made from wasted cotton yarns, crafted with a conscious vision. The **dyes and block** printing techniques used are entirely **natural** and environmentally friendly, with colors derived from sources such as indigo for blue, turmeric for yellow, sindoor flower for red, iron oxide for black, and limestone for white. These colors, combined with plant gum, are integral to all projects at Maati. Garments are assembled by local artisans in Rajasthan, showcasing their exquisite craftsmanship. The ideology of Maati emphasizes collective growth and ethical practices within the clothing and fashion industry. As a PETA - verified label, Maati is committed to a circular economy and implements various practices to minimize environmental impact. The fabrics are both upcycled and ethically produced, reflecting the brand's dedication to promoting positive change and supporting environmental healing. The focus remains on reducing, reusing, and upcycling materials to create unique yet eco - friendly products.

Table 1: Comparisons of Brands established with the focus on Sustainability

S. No	Brand Name	Sustainable Approach	Circular Fashion Concepts & Longevity
1	Doodlage	Upcycle/Recycling /Repurpose/ Artisanal	Season less garment, Gender less garments
2	Ka - sha	Zero waste, addressing non - recyclable textile waste and providing alternatives for reuse/repurposing	pre - loved clothing, enhancing, mending, and reimagining
3	Maati	Natural & Recycled fabrics. Natural Dyes & colour, Ethical practices, Collaboration with Artisans	Sustainable material leading to closing resource loop
4	Rang sutra	Focus on empowering rural artisans, financial independence and fair wages, Using Surplus fabrics	Increasing life span through Upcycling and reuse

(D) Rang sutra

Sumita founded Rang sutra to empower rural artisans, particularly women, by blending traditional craftsmanship with modern markets. Her journey began with a vision to create a sustainable enterprise that not only provides fair wages and steady work but also fosters community development. Through Rang sutra, Sumita has built a platform where artisans can thrive, preserving cultural heritage while securing economic independence for future generations.

CRAFT FOR CHANGE is a collection of products created from upcycled, surplus fabric. By repurposing materials that would otherwise be discarded, the brand aims to develop practical and environmentally friendly products that highlight the beauty of mindful design. This collection underscores the commitment to fostering a more sustainable future through innovative practices and responsible sourcing. The initiative reflects a broader dedication to sustainability, emphasizing the importance of reducing waste and promoting ethical production methods. By transforming surplus fabric into functional items, CRAFT FOR CHANGE not only minimizes environmental impact but also celebrates the potential of creative reuse. The collection serves as a testament to the brand's mission to inspire conscious consumerism and contribute positively to the planet.

4. Conclusion

To summarize, the study of circularity in the fashion industry, particularly through the lens of traditional crafts, indicates a viable path toward sustainable development. The circular economy principles—designing for longevity, resource efficiency, and closed - loop systems—are critical in solving the environmental concerns presented by fast fashion. By incorporating indigenous craft traditions that emphasize longevity and cultural importance, the fashion industry can mitigate the negative consequences of mass production and consumerism.

The findings highlight the significance of encouraging a collaborative approach that brings together designers, artisans, and customers in a common commitment to sustainability. As the industry is under increasing pressure to innovate and decrease waste, the implementation of circular design concepts provides a feasible alternative for extending product lifecycles while minimizing environmental effect.

Stakeholders must acknowledge the importance of crafts as not only artistic expressions, but also as critical components in the development of a more sustainable fashion environment.

In conclusion, establishing circularity in fashion necessitates a concerted effort to reconsider manufacturing and

consumption practices. By embracing ethical standards and promoting local craftsmanship, the industry can pave the way for a future that prioritizes sustainability, ensuring that both people and the world prosper.

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