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FASHION AND ENVIRONMENTAL SUSTAINABILITY: ENTREPRENEURSHIP, INNOVATION AND TECHNOLOGY, EDITED BY LÉO-PAUL DANA, ROSY BOARDMAN, AIDIN SALAMZADEH, VIJAY PEREIRA, AND MICHELLE BRANDSTRUP, SPRINGER, 2025

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Abstract

This volume offers an original multidisciplinary perspective on how environmental sustainability challenges the contemporary fashion industry, creating opportunities to reduce environmental and social impacts through entrepreneurship, innovation, technology, and marketing. Drawing on multidisciplinary contributions, the book examines sustainability across the entire fashion value chain, from materials and production processes to supply chain management, circular economy, sustainable business models, and consumer behaviour. International case studies illustrate how sustainability challenges are shaped by different economic, institutional, and cultural contexts. Findings highlight that sustainable transformation requires technological innovation, responsible managerial practices, and changes in consumption behaviours. The study ultimately highlights the importance of shared responsibility and greater awareness among firms, consumers, and society in driving the sustainable transformation of the fashion industry.

Review

The volume *Fashion and Environmental Sustainability: Entrepreneurship, Innovation and Technology*, edited by Léo-Paul Dana, Rosy Boardman, Aidin Salamzadeh, Vijay Pereira, and Michelle Brandstrup, examines how sustainability is reshaping the contemporary fashion industry, with particular attention to innovation processes, technological development, business models, marketing strategies, and managerial practices.

Bringing together scholars from different disciplinary backgrounds, the book offers an integrated and multidisciplinary perspective on the transformation of the fashion sector. It addresses a broad range of interconnected research areas, including textile materials, innovation and production processes, supply chain management, marketing, circular economy, and sustainable business models. This multidisciplinary approach reflects the complex environmental, technological, managerial, and social challenges currently facing the fashion industry, which are closely connected to broader international sustainability goals.

The volume is original for two main reasons. First, the book approaches environmental sustainability as an issue that involves the entire fashion value chain, going beyond materials and production processes. The chapters show that environmental sustainability also depends on supply chain decisions, marketing practices, consumer awareness, and changes in consumption behaviours.

Second, although the title focuses on environmental sustainability, the volume clearly highlights the relevance of its social dimension. Issues such as working conditions, workers' health and safety, and wages are presented as central challenges for the fashion industry, questioning business models that continue to rely on cost advantages derived from low-cost labour and highlighting the need for shared responsibility among companies, consumers, and policy makers.

The volume is organised into five sections. The opening section provides a historical perspective on the relationship between fashion and environmental sustainability and examines the evolution of the textile and garment industry, highlighting the main transformations that have shaped the sector over time. Starting from traditional textile production, the chapter traces the transition towards industrialisation and, more recently, towards a phase characterised by technological innovation and digital transformation. It shows how mechanisation and mass production significantly increased productivity and accessibility but also contributed to the environmental and social challenges that face the fashion industry today. Sustainability therefore emerges as a response to the limitations of a production model historically centred on efficiency, growth, and large-scale manufacturing.

In this context, the introductory chapter also highlights the growing role of technologies such as computer-aided design (CAD), computer-aided manufacturing (CAM), robotics, artificial intelligence (AI), e-commerce, and digital marketing in reshaping production processes and the relationship between firms and consumers, anticipating many of the themes explored in the subsequent chapters. This historical perspective frames textiles not simply as products, but as the result of continuous interactions between natural resources, technological development, economic choices, and society. This premise provides the basis for understanding sustainability as an issue that extends beyond environmental concerns to encompass economic, technological, and social dimensions.

The analysis then focuses on three traditional materials - wool, leather, and cotton - which are presented as a starting point for understanding the environmental and social impacts of the textile and garment industry. Moving beyond a purely technical perspective, the chapters examine their historical development, production processes, and sustainability implications, showing how decisions made at the material level influence the environmental and social impact of fashion long before products reach the market.

Particularly interesting is the analysis of synthetic fleece, which shows that technological innovation does not necessarily lead to more sustainable outcomes. Although synthetic materials may improve product performance and functionality, they can also generate new environmental challenges, including microplastic pollution and end-of-life management. This example reinforces one of the central messages of the volume: sustainability requires a life-cycle perspective in which material choices are considered strategic decisions with implications that extend beyond production processes.

The second section broadens the perspective through a series of international case studies from Canada, India, Bangladesh, Ethiopia, and several African countries. Together, these contributions illustrate how sustainability challenges are shaped by different economic, institutional, and cultural environments, highlighting the influence of local contexts on the strategies adopted by fashion firms. Rather than proposing a single pathway towards sustainable fashion, the contributors show that local conditions, industrial structures, and policy frameworks play a central role in shaping both opportunities and constraints.

The case studies also reveal the diverse ways in which sustainability is interpreted across different settings. The Canadian Lubertex case illustrates how industry transformations can require a profound rethinking of traditional business models. Facing the decline of textile manufacturing in Canada and increasing competition from Chinese producers, the family-owned company shifted from fabric manufacturing and supply towards

finished products, particularly bedding and linens for the hotel industry. The case highlights how entrepreneurial adaptation involved redefining resources, customer relationships, and the firm's value proposition.

The chapters on India and Bangladesh offer a different perspective, highlighting the tensions faced by major garment-producing countries, where sustainability objectives intersect with issues related to production costs, working conditions, and the pressures of global supply chains. The Ethiopian case examines the role of foreign direct investment, mainly from Asian manufacturing countries, in expanding the textile and apparel industry through export-oriented industrial parks. While these investments create opportunities for employment, industrial development, and integration into global fashion supply chains, the chapter also raises questions about dependence on foreign firms, knowledge transfer to local companies, workers' wages and skills development, as well as the pressure generated by large-scale textile production in terms of energy use, water consumption, and waste management.

The inclusion of a chapter on contemporary kink fashion further extends this perspective by introducing the role of cultural contexts and consumer practices in shaping approaches to sustainability. Focusing on a segment associated with alternative fashion communities and garments such as latex clothing, leather pieces, and corsetry, the chapter shows how fashion products can acquire meanings linked to identity, self-expression, and personal attachment.

Overall, the section shows that the transition towards sustainability in fashion is strongly context-dependent, requiring approaches that consider the specific characteristics of different production systems, institutional environments, market dynamics, and consumer practices.

The third section focuses on the role of innovation in advancing sustainability across the fashion value chain. The chapters examine how technological innovation, digitalisation, supply chain management, and consumer behaviour contribute to redefining how fashion firms create, communicate, and deliver value. Rather than viewing innovation simply as technological progress, they argue that sustainability also requires a rethinking of production models through demand-driven manufacturing, closer collaboration across the supply chain, and longer product life cycles to reduce the industry's environmental footprint.

A relevant contribution is the chapter on the Digital Product Passport, which addresses one of the key challenges of sustainable fashion: improving transparency across increasingly complex global supply chains. Conceived as a digital identity accompanying products throughout their life cycle, the Digital Product Passport provides verified information on materials, production processes, and environmental performance, thereby strengthening traceability for firms, regulators, and consumers. Through

the case of PaperTale, the authors explore whether the Digital Product Passport can become the fashion industry's long-awaited "killer app". Their analysis suggests that the main obstacle is not technological but organisational. Although the necessary digital solutions are already available, their widespread adoption remains constrained by the absence of common standards, limited data sharing, and the reluctance of firms to collaborate across the supply chain. The chapter therefore argues that the transformative potential of the Digital Product Passport depends less on technological progress than on governance mechanisms capable of fostering trust, information sharing, and cooperation between fashion and technology firms.

The section also explores the relationship between sustainability and consumer behaviour, showing how impulse buying and fast-fashion consumption continue to hinder the transition towards more sustainable consumption patterns. Sustainability assessment systems and fashion brand ratings further highlight the growing importance of reliable indicators for evaluating corporate sustainability performance.

Taken together, these chapters highlight the tensions that continue to characterise the transition towards a more sustainable fashion industry. Although digital technologies and new production models offer important opportunities, global sourcing strategies are still strongly influenced by labour costs, with much of production concentrated in low-cost manufacturing countries, particularly in Asia. The section suggests that technological innovation alone cannot address the challenges of sustainability without broader changes in production models, supply chain management, and consumer behaviour.

The fourth section explores circular economy strategies, highlighting the strategic role of marketing in supporting sustainability. The contributors argue that marketing extends beyond encouraging consumers to purchase "green" products and can instead reduce waste throughout the product life cycle by promoting product personalisation, digital technologies - particularly artificial intelligence - and greater consumer engagement. A substantial share of waste is attributed to the misalignment between supply and consumer demand, which often results in overproduction and unsold inventory. Data analytics and artificial intelligence can help firms better anticipate consumer preferences and align production more closely with actual market demand.

One of the main insights emerging from the chapter is that reuse and recycling should not be viewed merely as end-of-life waste-management practices, but as the result of decisions taken much earlier in the value chain, including product design, marketing strategies, and customer relationships. The chapter further highlights the potential contribution of marketing in moving from standardised mass production towards more

personalised products and services. This approach encourages firms to develop offerings that better reflect consumer needs, reducing impulse purchases, product returns, unused garments, and ultimately waste.

The authors also emphasise a more active role for consumers, suggesting that digital technologies enable closer interaction between firms and customers and support value co-creation. Digital tools such as virtual fitting rooms, virtual reality, three-dimensional product visualisation, and artificial intelligence are presented as solutions for improving the purchasing experience, allowing consumers to evaluate products more accurately before buying and thereby reducing unnecessary returns. More broadly, marketing is presented not only as a tool for influencing demand, but as a strategic function that can support reuse, recycling, and the transition towards more circular models of production and consumption.

From this perspective, the case of Kringloopwinkel Steenwijk, a Dutch non-profit social enterprise underlines how circular business models can combine product reuse with social inclusion. Beyond collecting, sorting, and redistributing donated goods, the organisation reinvests its revenues in community initiatives, including a training café that provides work experience and employment opportunities for disadvantaged people, while garments unsuitable for the local market are redirected to international reuse channels.

Although more concise than the previous parts of the volume, the section effectively broadens the discussion of circular economy beyond waste reduction by showing that extending product life cycles requires not only technological solutions but also innovation in marketing, distribution, and consumer practices.

The final section examines future directions of the fashion industry focussing on entrepreneurship, innovation, and responsible management. The chapters address unconventional materials, sustainable business models, corporate environmental strategies, responsible brand identity, human resource management, and workers' rights. Together, they broaden the concept of sustainability beyond environmental performance, showing that the future of fashion also depends on organisational change, ethical practices, and social responsibility.

The chapter on sustainable fashion business models is particularly relevant because it links the need for change to the environmental and social impacts generated by the traditional fashion industry. Events such as the Nike labour controversy in the 1990s and the Rana Plaza disaster in Bangladesh contributed to increasing public awareness of the hidden costs of global fashion production and strengthening consumer activism. In response to these challenges, the authors argue that the transition towards sustainability requires the integration of three main dimensions: sustainable materials, re-

sponsible labour practices, and innovative business models.

Focusing on the latter dimension, the authors examine a range of sustainable fashion business models that illustrate how digital technologies and innovation can reshape traditional approaches to design, production, and consumption. Among these models, fashion-on-demand is particularly relevant because it challenges the traditional logic of producing large quantities before demand is known, seeking instead to align production with actual consumer needs. Similarly, technologies such as 3D virtual sampling, body scanning, and virtual changing rooms show how digital innovation can reduce the need for physical prototypes, improve product fit, and create new forms of interaction between firms and consumers. These approaches suggest that sustainability requires a rethinking of the fashion system rather than incremental improvements in isolated activities. The case of Levi's further illustrates how established companies can incorporate sustainability principles by redesigning specific stages of their production processes. Focusing on the high water consumption traditionally associated with denim manufacturing, the chapter shows how innovations in finishing techniques and water-saving processes can reduce resource use while maintaining product quality.

The comparison between Veja and Twins for Peace, two French sneaker brands operating in the Brazilian market, further extends the analysis by showing how sustainability can become part of entrepreneurial brand identity. While Veja illustrates an eco-sustainable strategy focused on reducing environmental impacts across the value chain, Twins for Peace represents a socially responsible approach centred on community development, education, and working conditions. The chapter illustrates the importance of coherence between sustainability communication and concrete practices to build consumer trust and long-term brand value. However, the broader challenge remains whether these alternative models can scale sufficiently to transform an industry still strongly influenced by fast-fashion dynamics, global competition, and cost-driven production strategies. The section therefore suggests that sustainable transformation depends not only on the adoption of new materials and technologies, but also on firms' ability to rethink business models, organisational practices, and the principles guiding value creation.

A recurring message emerging from these chapters is that moving towards sustainability requires changes from both companies and consumers. For firms, investment in training and the development of knowledge, skills, and managerial capabilities is essential to guide this transition, while greater consumer awareness plays an important role in challenging fast-fashion consumption patterns.

Overall, one of the strengths of the volume is the interpretation of sustainability as a multidimensional concept that extends well beyond envi-

ronmental concerns. The five sections reveal a coherent editorial framework in which sustainability is progressively examined from the environmental implications of raw materials to the technological, managerial, organisational, and social transformations shaping the future of the fashion industry. This progression represents one of the book's main strengths, underlining the interdependence between materials, production processes, supply chains, marketing, circular economy, entrepreneurship, and social responsibility.

Fashion and Environmental Sustainability: Entrepreneurship, Innovation and Technology is a valuable contribution to the growing literature on sustainable fashion. Its multidisciplinary perspective and international scope make it particularly relevant for scholars, students, business leaders, and policymakers. Beyond its academic contribution, the book also encourages reflection on the responsibilities shared by different actors across the fashion value chain. A more sustainable fashion industry ultimately depends not only on how companies design, produce, and manage their activities, but also on how consumers understand the impact of their choices and reconsider their relationship with fashion products.