

ASIAN MICROECONOMIC REVIEW

Volume: 6 Issue: 3

(July-September), 2026



 **KMF** PUBLISHERS ISSN: 2789-9861 www.kmf-publishers.com/amr/



Research Article

Exploring Managerial Challenges in Sustainable Material Implementation in Fashion Design

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Received: 20 May 2026

Accepted: 30 June 2026

Published: 3 July 2026

Publisher's Note: KMF Publishers stays neutral about jurisdictional claims in published maps and institutional affiliations.

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Abstract

The transition toward sustainability has become a strategic imperative for the global fashion industry, with sustainable material implementation playing a central role in reducing environmental impacts. However, integrating sustainable materials into fashion design presents complex managerial challenges. This study explores these challenges through a qualitative research approach based on secondary data analysis. Drawing on the Resource-Based View (RBV), Institutional Theory, and Circular Economy Theory, the research identifies key barriers related to economic constraints, supply chain complexity, technological limitations, organisational resistance, and market dynamics. The findings reveal that high costs, limited scalability of innovative materials, lack of supply chain transparency, and misalignment between organisational functions significantly hinder adoption. Furthermore, the study highlights the persistent tension between sustainability objectives and profitability, as well as the influence of weak regulatory frameworks and inconsistent consumer behaviour. By offering an integrative theoretical perspective, the study contributes to the literature on sustainable fashion management and provides strategic insights for practitioners. The research concludes that achieving effective sustainable material implementation requires systemic transformation, cross-sector collaboration, and long-term strategic commitment.

Keywords: sustainable fashion, sustainable materials, managerial challenges, circular economy, supply chain management, resource-based view, institutional theory.

Citation: Amena, T., & Mannan, K.A. (2026). Exploring Managerial Challenges in Sustainable Material Implementation in Fashion Design. *Asian Microeconomic Review*, 6(3), 1-17. DOI: <https://doi.org/10.64907/xkmf.v6i3.amr.6>

1. Introduction

The global fashion industry, valued at trillions of dollars, plays a significant role in economic development, employment generation, and cultural expression. However, it is also recognised as one of the most environmentally and socially impactful industries in the world. The rise of fast fashion has accelerated production cycles, increased consumption rates, and intensified environmental degradation through excessive resource use, pollution, and waste generation (Niinimäki et al., 2020). As a result, sustainability has emerged as a critical strategic priority for fashion brands, policymakers, and stakeholders.

Among the various dimensions of sustainability in fashion, the implementation of sustainable materials has gained considerable attention. Materials account for a substantial portion of the environmental footprint of fashion products, influencing water consumption, carbon emissions, and waste generation throughout the product life cycle (Fletcher, 2007; Sandin & Peters, 2018). Sustainable materials, such as organic cotton, recycled polyester, biodegradable fibres, and bio-based textiles, offer potential solutions to mitigate these environmental impacts. However, despite their promise, their adoption remains uneven and limited across the industry.

The integration of sustainable materials into fashion design is not merely a technical or operational decision; it is fundamentally a managerial challenge. It requires reconfiguration of supply chains, redesign of

production processes, alignment of organisational goals, and balancing of economic constraints. Managers must navigate complex trade-offs between sustainability and profitability, innovation and risk, and short-term costs and long-term benefits (Thorisdottir & Johannsdottir, 2019). This complexity is further compounded by the fragmented and globalised nature of fashion supply chains, which often lack transparency and traceability (Egels-Zandén et al., 2015).

In recent years, increasing regulatory pressures and consumer awareness have driven companies to adopt more sustainable practices. Governments and international organisations are introducing policies aimed at reducing environmental impacts, while consumers are becoming more conscious of the ethical and environmental implications of their purchasing decisions (Henninger et al., 2016). Nevertheless, the gap between sustainability intentions and actual implementation remains significant. Many fashion companies struggle to scale sustainable material usage due to economic, technological, and organisational barriers.

One of the primary challenges lies in the economic dimension. Sustainable materials are often more expensive than conventional alternatives due to limited economies of scale, higher production costs, and investment in research and development. These costs pose significant challenges for companies operating in highly competitive markets where price sensitivity is high. Consequently, managers must carefully consider pricing strategies, cost structures, and value propositions when integrating

sustainable materials (Cachon & Swinney, 2011).

Technological limitations also present significant obstacles. While advancements in material science have led to the development of innovative sustainable materials, many of these materials face challenges related to performance, durability, and scalability. For instance, some bio-based materials may not meet the quality standards required for mass-market fashion, limiting their adoption (Rahman, 2025). This creates a dilemma for managers who must balance innovation with reliability and consumer expectations.

Organisational factors further complicate the implementation process. Resistance to change, lack of expertise, and misalignment between departments can hinder the adoption of sustainable materials. Designers, who play a crucial role in material selection, often have limited influence over strategic decisions, which are typically driven by cost and efficiency considerations (Williams et al., 2020). This disconnect between design and management can impede the integration of sustainability into core business practices.

Moreover, the complexity of global supply chains poses significant challenges for sourcing sustainable materials. Fashion supply chains often involve multiple tiers of suppliers across different regions, making it difficult to ensure transparency, traceability, and compliance with sustainability standards. The lack of standardised certification systems further exacerbates this issue, leading to inconsistencies and potential risks of greenwashing (Sehnem et al., 2023).

Given these challenges, there is a growing need for a comprehensive understanding of the managerial aspects of sustainable material implementation in fashion design. While existing literature has extensively examined sustainability in fashion, there is limited research focusing specifically on the managerial challenges associated with material adoption. This study aims to address this gap by exploring the economic, technological, organisational, and institutional barriers faced by managers in implementing sustainable materials.

The study is guided by the following research questions:

- What are the key managerial challenges in implementing sustainable materials in fashion design?
- How do economic, technological, and organisational factors influence these challenges?
- How can theoretical frameworks explain the complexities of sustainable material adoption?

By addressing these questions, this research contributes to both academic literature and managerial practice. It provides insights into the complexities of sustainable material implementation and offers a theoretical foundation for understanding the challenges faced by fashion managers. Ultimately, the study aims to support the transition toward a more sustainable and responsible fashion industry.

2. Literature Review

Sustainable fashion has evolved as a response to the environmental and social challenges associated with the conventional fashion industry. It encompasses a broad range of practices aimed at reducing environmental impact, promoting ethical labour practices, and ensuring economic viability. According to Fletcher (2007), sustainable fashion involves a holistic approach that considers the entire life cycle of a garment, from raw material extraction to disposal.

Henninger et al. (2016) argue that sustainable fashion is a multidimensional concept with varying interpretations among stakeholders. For some, it focuses on environmental sustainability, while for others, it includes social and economic dimensions. This lack of consensus contributes to inconsistencies in implementation and measurement.

The concept has further evolved with the emergence of circular economy principles, which emphasise resource efficiency, waste reduction, and closed-loop systems. Circular fashion aims to extend product life cycles through recycling, reuse, and repair, thereby minimising environmental impact (Niinimäki et al., 2020).

2.1 Sustainable Materials in Fashion Design

Sustainable materials are central to the concept of sustainable fashion. They include a wide range of materials designed to reduce environmental impact, such as organic fibres, recycled textiles, biodegradable materials, and innovative bio-based alternatives.

Research indicates that material selection significantly influences the environmental footprint of fashion products. Sandin and Peters (2018) highlight that fibre production and processing account for a large share of greenhouse gas emissions and resource consumption in the fashion industry. Therefore, transitioning to sustainable materials is essential for reducing environmental impact.

However, the adoption of sustainable materials is not straightforward. It requires significant changes in sourcing strategies, production processes, and product design. Designers must consider not only aesthetic and functional aspects but also environmental and social implications.

2.2 Economic Challenges in Sustainable Material Adoption

Economic factors are among the most significant barriers to sustainable material implementation. Sustainable materials often involve higher production costs due to limited availability, specialised processing, and lower economies of scale (Cachon & Swinney, 2011).

Thorisdottir and Johannsdottir (2019) emphasise that the higher costs of sustainable materials can affect pricing strategies and profit margins. This is particularly challenging in the fast fashion segment, where low prices and rapid turnover are key competitive factors.

Moreover, the uncertainty associated with new materials increases investment risks. Companies may be hesitant to adopt innovative materials due to concerns about

performance, consumer acceptance, and long-term viability.

2.3 Supply Chain Complexity and Transparency

The global and fragmented nature of fashion supply chains presents significant challenges for sustainable material implementation. Fashion supply chains often involve multiple tiers of suppliers, making it difficult to ensure transparency and traceability (Egels-Zandén et al., 2015).

Transparency is critical for verifying the sustainability of materials and ensuring compliance with environmental and social standards. However, the lack of standardised tracking systems and certification mechanisms complicates this process.

Sehnem et al. (2023) highlight that supply chain complexity is a major barrier to the adoption of circular economy practices in fashion. Companies must invest in supply chain mapping, monitoring, and collaboration to overcome these challenges.

2.4 Technological Innovation and Limitations

Technological innovation plays a crucial role in the development of sustainable materials. Advances in material science have led to the creation of innovative alternatives, such as bio-based textiles and biodegradable fabrics.

However, these innovations are often accompanied by significant challenges. Rahman (2025) notes that many sustainable materials face limitations in terms of performance, durability, and scalability. For example, some biodegradable materials may

not meet the quality standards required for certain applications.

Additionally, scaling up production of innovative materials requires substantial investment and infrastructure, which may not be feasible for all companies.

2.5 Organisational and Managerial Challenges

Organisational factors play a critical role in the implementation of sustainable materials. Resistance to change, lack of expertise, and misalignment between departments can hinder adoption.

Williams et al. (2020) emphasise that designers often have limited influence over strategic decisions, which are typically driven by cost considerations. This creates a disconnect between design and management, limiting the integration of sustainability into core business practices.

Furthermore, the lack of clear sustainability goals and metrics can lead to inconsistent implementation and evaluation.

2.6 Consumer Behaviour and Market Dynamics

Consumer behaviour significantly influences the adoption of sustainable materials. While there is growing awareness of sustainability issues, this does not always translate into purchasing behaviour.

Henninger et al. (2016) highlight the “attitude-behaviour gap,” where consumers express concern for sustainability but prioritise price and convenience when making purchasing decisions.

This creates a challenge for companies, as they must balance sustainability with affordability and market competitiveness.

2.7 Regulatory and Institutional Context

Regulatory frameworks and institutional pressures play an important role in shaping sustainable practices in the fashion industry. Governments and international organisations are increasingly introducing policies to promote sustainability.

However, the effectiveness of these regulations varies across regions. Weak enforcement and a lack of standardisation can limit their impact.

Institutional Theory suggests that organisations respond to external pressures, such as regulations and societal expectations, by adopting sustainable practices. However, without strong and consistent institutional support, these efforts may remain superficial.

2.8 Research Gap

Despite extensive research on sustainable fashion, there is a lack of studies focusing specifically on the managerial challenges associated with sustainable material implementation. Most studies address sustainability at a general level, without examining the complexities of material adoption from a managerial perspective.

This study addresses this gap by providing a comprehensive analysis of the challenges faced by managers in integrating sustainable materials into fashion design.

3. Theoretical Framework

Understanding the managerial challenges associated with sustainable material implementation in fashion design requires a robust theoretical foundation. This study adopts an integrative framework based on the Resource-Based View (RBV), Institutional Theory, and Circular Economy Theory. These perspectives collectively explain how internal capabilities, external pressures, and systemic sustainability principles shape managerial decision-making and organisational behaviour.

3.1 Resource-Based View (RBV)

The Resource-Based View (RBV) posits that firms achieve sustainable competitive advantage by acquiring and effectively utilising valuable, rare, inimitable, and non-substitutable (VRIN) resources (Barney, 1991). In the context of sustainable fashion, materials themselves can be conceptualised as strategic resources that contribute to differentiation, innovation, and brand value.

Sustainable materials, such as organic fibres, recycled textiles, and bio-based innovations, offer firms the potential to enhance their environmental performance while appealing to increasingly conscious consumers. However, these materials often lack the characteristics required for widespread adoption. For instance, they may be scarce, costly, or difficult to integrate into existing production systems. As a result, firms must develop new capabilities, including supplier collaboration, technological expertise, and sustainability-oriented design competencies (Hart, 1995).

From an RBV perspective, the managerial challenge lies in aligning resource acquisition with organisational capabilities. Firms that lack the necessary knowledge or infrastructure may struggle to leverage sustainable materials effectively. Furthermore, the high cost and limited availability of these materials create barriers to entry, restricting their use to firms with sufficient financial and technological resources (Dyer & Singh, 1998).

Another important aspect of RBV is the role of dynamic capabilities, the ability of firms to integrate, build, and reconfigure internal and external competencies in response to changing environments (Teece et al., 1997). In the rapidly evolving landscape of sustainable fashion, dynamic capabilities are essential for adapting to new materials, technologies, and market demands. Managers must continuously learn, innovate, and collaborate to successfully implement sustainable materials.

3.2 Institutional Theory

Institutional Theory provides a complementary perspective by emphasising the influence of external pressures on organisational behaviour. According to DiMaggio and Powell (1983), organisations are shaped by three types of institutional pressures: coercive, normative, and mimetic.

- **Coercive pressures** arise from regulations and legal requirements. Governments and international organisations are increasingly introducing policies to promote sustainability in the fashion industry, such as restrictions on hazardous

chemicals and requirements for transparency in supply chains.

- **Normative pressures** stem from societal expectations and professional norms. Growing consumer awareness and advocacy for ethical and sustainable practices exert pressure on firms to adopt environmentally responsible materials (Henninger et al., 2016).
- **Mimetic pressures** occur when organisations imitate successful competitors. As leading brands adopt sustainable materials, others may follow to maintain legitimacy and competitiveness.

Despite these pressures, the adoption of sustainable materials is often inconsistent and superficial. This phenomenon can be explained by the concept of “decoupling,” where organisations adopt symbolic practices to appear compliant without making substantive changes (Meyer & Rowan, 1977). In the fashion industry, this may manifest as greenwashing, where companies promote limited sustainable initiatives while continuing unsustainable practices.

Institutional Theory also highlights the importance of legitimacy. Firms adopt sustainable materials not only for economic benefits but also to gain social approval and enhance their reputation. However, achieving legitimacy requires credible and transparent practices, which can be difficult to implement due to supply chain complexity and lack of standardised certifications (Egels-Zandén et al., 2015).

Thus, the managerial challenge from an institutional perspective involves balancing

compliance with external pressures while ensuring genuine and effective implementation of sustainable materials.

3.3 Circular Economy Theory

Circular Economy Theory represents a transformative approach to sustainability by promoting closed-loop systems that minimise waste and maximise resource efficiency. Unlike the traditional linear model of “take-make-dispose,” the circular economy emphasises reuse, recycling, and regeneration (Geissdoerfer et al., 2017).

In the fashion industry, circular principles are closely linked to sustainable material implementation. Materials must be designed for durability, recyclability, and biodegradability to support circular systems. This requires a fundamental shift in design thinking, production processes, and business models.

However, the transition to a circular economy presents significant managerial challenges. First, it requires substantial investment in infrastructure, such as recycling facilities and reverse logistics systems. Second, it demands collaboration across the value chain, including suppliers, manufacturers, retailers, and consumers (Sehnm et al., 2023). Third, it involves overcoming technological limitations related to material recovery and recycling.

Circular Economy Theory also underscores the importance of systemic change. Sustainable material implementation cannot be achieved in isolation; it must be integrated into broader organisational and industry-level transformations. Managers must adopt a holistic perspective that considers the entire

life cycle of products and the interconnectedness of different stakeholders.

Moreover, the success of circular initiatives depends on consumer participation. Practices such as recycling, reuse, and repair require changes in consumer behaviour, which can be difficult to achieve due to convenience and cultural factors.

3.4 Integrative Theoretical Perspective

By integrating RBV, Institutional Theory, and Circular Economy Theory, this study provides a comprehensive framework for understanding managerial challenges in sustainable material implementation.

- **RBV** explains internal resource and capability constraints.
- **Institutional Theory** highlights external pressures and legitimacy concerns.
- **Circular Economy Theory** emphasises systemic and long-term sustainability goals.

Together, these perspectives reveal that managerial challenges are multidimensional, involving economic, organisational, technological, and institutional factors. This integrative framework serves as the foundation for analysing the findings of this study.

4. Research Methodology

This study adopts a qualitative research design based on secondary data analysis to explore managerial challenges in sustainable material implementation in fashion design. Qualitative research is particularly suitable

for investigating complex, context-dependent phenomena where in-depth understanding is required (Creswell & Poth, 2018).

Given the exploratory nature of the research, a qualitative approach allows for the synthesis of diverse perspectives and the identification of underlying themes. Secondary data analysis is appropriate in this context, as it enables the researcher to draw upon a wide range of existing studies, reports, and industry insights.

4.1 Data Collection

The study relies on secondary data sources, including:

- Peer-reviewed journal articles
- Academic books
- Industry reports and white papers
- Publications from international organisations
- Credible online databases

These sources were selected based on their relevance, credibility, and contribution to the topic of sustainable fashion and material implementation.

A systematic approach was used to identify relevant literature. Keywords such as “sustainable fashion,” “sustainable materials,” “fashion supply chain,” and “circular economy in fashion” were used to search academic databases, including Google Scholar, Scopus, and Web of Science.

4.2 Inclusion and Exclusion Criteria

To ensure the quality and relevance of the data, the following criteria were applied:

Inclusion criteria:

- Studies published in peer-reviewed journals
- Publications from reputable organisations
- Research focusing on sustainability in fashion
- Studies addressing material innovation, supply chains, or managerial challenges

Exclusion criteria:

- Non-academic or unreliable sources
- Studies unrelated to fashion or materials
- Outdated research lacking relevance to current industry practices

4.3 Data Analysis Method

The study employs thematic analysis to analyse the collected data. Thematic analysis is a widely used qualitative method for identifying, analysing, and reporting patterns within data (Braun & Clarke, 2006).

The analysis followed a six-step process:

- **Familiarisation with data** – Reviewing and understanding the selected literature
- **Initial coding** – Identifying key concepts and recurring issues
- **Theme development** – Grouping codes into broader themes
- **Reviewing themes** – Ensuring consistency and relevance
- **Defining and naming themes** – Clearly articulating each theme
- **Interpretation** – Linking themes to theoretical frameworks

This approach allows for a systematic and rigorous analysis of complex qualitative data.

4.4 Validity and Reliability

Ensuring the credibility and reliability of qualitative research is essential. This study adopts several strategies to enhance validity:

- **Triangulation:** Using multiple data sources to corroborate findings
- **Peer-reviewed sources:** It relies on reliable academic sources.
- **Transparency:** Clearly documenting the research process

Reliability is ensured by following a systematic and replicable methodology.

4.5 Ethical Considerations

As the study is based on secondary data, it does not involve direct interaction with human participants. However, ethical considerations remain important.

All sources are properly cited to avoid plagiarism, and the study adheres to academic integrity standards (Mannan & Farhana, 2026). Additionally, the research respects intellectual property rights by acknowledging original authors.

4.6 Limitations of the Study

Despite its strengths, the study has several limitations:

- **Dependence on secondary data:** Limited access to primary data.
- **Potential bias in existing literature:** Studies may reflect certain biases.
- **Lack of empirical validation:** Results rely on theoretical analysis.

These limitations suggest opportunities for future research, particularly empirical studies involving primary data collection.

5. Findings and Analysis

The thematic analysis of secondary data reveals that managerial challenges in sustainable material implementation in fashion design are multidimensional and deeply embedded within economic, organisational, technological, and institutional contexts. These challenges are not isolated; rather, they are interconnected and mutually reinforcing, creating a complex landscape for decision-makers. The findings are organised into six major themes.

5.1 Economic Constraints and Cost Pressures

One of the most significant barriers to sustainable material implementation is the economic constraint associated with higher costs. Sustainable materials, such as organic cotton, recycled polyester, and bio-based textiles, often require more expensive production processes, including certified farming practices, specialised technologies, and smaller-scale production systems (Sandin & Peters, 2018).

From a managerial perspective, cost considerations are central to decision-making. Fashion companies, particularly those operating under fast fashion models, are highly sensitive to cost structures due to intense market competition and consumer price expectations (Cachon & Swinney, 2011). As a result, managers face a dilemma: adopting sustainable materials may enhance brand value and environmental performance,

but it can also reduce profit margins and competitiveness.

Moreover, the lack of economies of scale in sustainable material production exacerbates cost challenges. Many sustainable materials are produced in limited quantities, leading to higher per-unit costs. This creates a barrier to widespread adoption, particularly for small and medium-sized enterprises (SMEs) with limited financial resources (Thorisdottir & Johannsdottir, 2019).

In addition, investment risks associated with new materials further complicate managerial decisions. Companies must invest in research, development, and supplier relationships without guaranteed returns. The uncertainty surrounding material performance, consumer acceptance, and long-term viability increases the perceived risk, discouraging adoption.

5.2 Supply Chain Complexity and Transparency Issues

The global and fragmented nature of fashion supply chains presents another major challenge. Sustainable material implementation requires transparency and traceability across multiple tiers of suppliers, which is often difficult to achieve.

Fashion supply chains typically involve raw material producers, processors, manufacturers, and distributors located in different regions, each with varying standards and practices (Egels-Zandén et al., 2015). This complexity makes it challenging for managers to verify the sustainability of materials and ensure compliance with environmental and social standards.

Traceability is particularly critical for sustainable materials, as certifications and claims must be validated. However, the lack of standardised tracking systems and inconsistent certification schemes creates confusion and increases the risk of greenwashing (Sehnem et al., 2023).

Furthermore, establishing reliable supplier relationships for sustainable materials can be difficult due to limited availability and geographic dispersion. Managers must invest time and resources in identifying and collaborating with suppliers who meet sustainability criteria. This often requires restructuring existing supply chains, which can be costly and time-consuming.

5.3 Technological Limitations and Innovation Barriers

Technological challenges represent a significant obstacle to the adoption of sustainable materials. While advancements in material science have led to the development of innovative alternatives, many of these materials are not yet fully mature or scalable.

One key issue is the performance of sustainable materials. Some bio-based or recycled materials may not meet the durability, comfort, or aesthetic standards required by consumers and designers (Rahman, 2025). This creates a trade-off between sustainability and product quality, which managers must carefully navigate.

Scalability is another critical concern. Many sustainable materials are developed in pilot stages and lack the infrastructure for mass production. Scaling up production requires significant investment in technology, facilities, and supply chain integration, which

may not be feasible for all companies (Geissdoerfer et al., 2017).

Additionally, technological uncertainty increases the risk associated with adopting new materials. Managers must evaluate the reliability and long-term viability of materials, which can be difficult due to limited data and experience.

5.4 Organisational Challenges and Internal Resistance

Organisational dynamics play a crucial role in shaping the implementation of sustainable materials. Resistance to change is a common challenge, particularly in organisations that prioritise efficiency, cost reduction, and short-term profitability.

Sustainability initiatives often require changes in organisational culture, processes, and decision-making structures. However, these changes may face resistance from employees and managers who are accustomed to traditional practices (Williams et al., 2020).

Another key issue is the misalignment between different departments. For example, designers may prioritise sustainability and innovation, while procurement and finance departments focus on cost efficiency. This lack of alignment can hinder the integration of sustainable materials into product development.

Furthermore, the limited influence of designers in strategic decision-making reduces their ability to advocate for sustainable materials. In many organisations, decisions are driven by senior management and financial considerations, leaving little

room for design-driven sustainability initiatives.

5.5 Consumer Behaviour and Market Dynamics

Consumer behaviour significantly influences the adoption of sustainable materials. Although awareness of sustainability issues is increasing, this does not always translate into purchasing decisions.

The “attitude-behaviour gap” is a well-documented phenomenon in sustainable consumption, where consumers express concern for the environment but prioritise price, convenience, and style when making purchases (Henninger et al., 2016). This creates a challenge for managers, as they must balance sustainability with market demand.

Price sensitivity is a major barrier, particularly in emerging markets and fast fashion segments. Sustainable products are often more expensive, limiting their accessibility and appeal to price-conscious consumers.

Additionally, the lack of consumer awareness and understanding of sustainable materials reduces demand. Many consumers are not familiar with the environmental benefits of different materials, making it difficult for companies to justify higher prices.

5.6 Regulatory and Institutional Barriers

Regulatory and institutional factors also play a significant role in shaping sustainable material implementation. While there is increasing pressure from governments and international organisations to adopt

sustainable practices, the effectiveness of these regulations varies.

In many regions, regulatory frameworks are weak or poorly enforced, limiting their impact on industry practices (DiMaggio & Powell, 1983). This creates an uneven playing field, where companies that invest in sustainability may face higher costs without corresponding benefits.

The lack of standardised definitions and certifications for sustainable materials further complicates the situation. Without clear guidelines, companies may struggle to identify and verify sustainable materials, leading to inconsistencies and potential reputational risks.

5.7 Interconnected Nature of Challenges

A critical insight from the analysis is the interconnected nature of these challenges. Economic constraints influence technological investment, which in turn affects scalability and supply chain integration. Organisational dynamics shape how companies respond to institutional pressures, while consumer behaviour impacts market viability.

This interconnectedness highlights the need for a holistic approach to sustainable material implementation. Managers must consider multiple dimensions simultaneously and develop integrated strategies to address these challenges.

6. Discussion

The findings of this study underscore the complexity and multidimensionality of

managerial challenges in implementing sustainable materials in fashion design. By interpreting these findings through the lenses of the Resource-Based View (RBV), Institutional Theory, and Circular Economy Theory, this section provides a deeper understanding of the underlying dynamics and implications.

6.1 Interpreting Economic Challenges through RBV

From an RBV perspective, sustainable materials represent strategic resources that can provide a competitive advantage. However, the findings indicate that these resources are often costly, scarce, and difficult to integrate, limiting their accessibility.

The high cost of sustainable materials reflects their rarity and the specialised capabilities required for their production. According to Barney (1991), resources that are valuable and rare can generate competitive advantage, but only if firms have the capabilities to utilise them effectively. In this context, many fashion companies lack the necessary capabilities, such as technological expertise and supplier networks, to fully leverage sustainable materials.

Dynamic capabilities are particularly important in addressing economic challenges. Firms must develop the ability to adapt to changing conditions, invest in innovation, and build partnerships with suppliers (Teece et al., 1997). This requires a long-term strategic perspective, which may conflict with the short-term focus of many fashion businesses.

6.2 Institutional Pressures and Organisational Responses

Institutional Theory provides insights into how external pressures influence organisational behaviour. The findings suggest that while regulatory and societal pressures are increasing, they are not always sufficient to drive substantive change.

Coercive pressures, such as regulations, are often weak or inconsistently enforced, limiting their effectiveness. Normative pressures from consumers and advocacy groups are growing, but the attitude-behaviour gap reduces their impact on actual purchasing decisions (Henninger et al., 2016).

Mimetic pressures play a significant role in driving adoption, as companies imitate competitors to maintain legitimacy. However, this can lead to superficial adoption and greenwashing, rather than genuine sustainability practices (Meyer & Rowan, 1977).

The concept of legitimacy is central to understanding these dynamics. Companies adopt sustainable materials not only for economic reasons but also to enhance their reputation and meet stakeholder expectations. However, achieving legitimacy requires transparency and credibility, which are difficult to achieve due to supply chain complexity.

6.3 Circular Economy and Systemic Transformation

Circular Economy Theory emphasises the need for systemic change in the fashion industry. The findings highlight that

sustainable material implementation is closely linked to broader circular practices, such as recycling, reuse, and waste reduction.

However, the transition to a circular economy is hindered by infrastructural and technological limitations. For example, the lack of recycling facilities and reverse logistics systems makes it difficult to recover and reuse materials (Geissdoerfer et al., 2017).

Moreover, circular initiatives require collaboration across the value chain, including suppliers, manufacturers, retailers, and consumers. This level of collaboration is difficult to achieve due to competing interests and a lack of coordination (Sehnem et al., 2023).

The findings also suggest that consumer behaviour is a critical factor in the success of circular practices. Without active participation from consumers, such as recycling and reuse, circular systems cannot function effectively.

6.4 Organisational Implications and Managerial Strategies

The study highlights the importance of organisational alignment in implementing sustainable materials. Managers must ensure that sustainability goals are integrated into all aspects of the organisation, including design, procurement, and marketing.

One key strategy is to enhance the role of designers in decision-making. Designers play a crucial role in material selection and product development, and their involvement can facilitate the integration of sustainability into design processes (Williams et al., 2020).

Another important strategy is to invest in capacity building and training. Employees must develop the knowledge and skills required to work with sustainable materials and implement new processes.

Collaboration is also essential. Companies must work closely with suppliers, industry partners, and policymakers to address shared challenges and develop innovative solutions.

6.5 Bridging the Gap Between Sustainability and Profitability

A central theme in the findings is the tension between sustainability and profitability. Managers must balance environmental and social objectives with financial performance, which can be challenging in competitive markets.

One approach to addressing this challenge is to adopt a long-term perspective. While sustainable materials may involve higher upfront costs, they can generate long-term benefits, such as brand loyalty, regulatory compliance, and risk reduction.

Another approach is to communicate the value of sustainability to consumers. By educating consumers about the benefits of sustainable materials, companies can increase willingness to pay and reduce price sensitivity.

6.6 Implications for Theory and Practice

The study contributes to theory by integrating RBV, Institutional Theory, and Circular Economy Theory to explain managerial challenges in sustainable material implementation. This integrative approach

provides a comprehensive understanding of the issue.

From a practical perspective, the findings offer valuable insights for managers. They highlight the need for strategic planning, organisational alignment, and collaboration to overcome challenges and achieve sustainability goals.

7. Conclusion

This study has explored the managerial challenges associated with sustainable material implementation in fashion design, highlighting the complex and interconnected nature of economic, organisational, technological, and institutional barriers. The findings demonstrate that despite increasing awareness and external pressure to adopt sustainable practices, fashion companies face significant obstacles in translating sustainability goals into actionable strategies.

One of the key conclusions is that economic constraints remain a dominant challenge. The high cost of sustainable materials, combined with limited economies of scale and uncertain returns on investment, discourages widespread adoption. This challenge is particularly pronounced in fast fashion and price-sensitive markets, where cost efficiency is a primary driver of decision-making. Managers must therefore navigate a delicate balance between sustainability and profitability, often prioritising short-term financial performance over long-term environmental benefits.

The study also emphasises the critical role of supply chain complexity in shaping sustainable material implementation. The

fragmented and globalised nature of fashion supply chains makes it difficult to ensure transparency, traceability, and compliance with sustainability standards. Without robust systems for monitoring and verification, companies face risks related to greenwashing and reputational damage.

Technological limitations further constrain the adoption of sustainable materials. While innovations in material science offer promising alternatives, issues related to performance, durability, and scalability hinder their integration into mainstream production. These challenges highlight the need for continued investment in research and development, as well as collaboration between industry stakeholders.

Organisational factors, including internal resistance and misalignment between departments, also play a significant role. The limited influence of designers in strategic decision-making and the lack of a sustainability-oriented organisational culture impede progress. To address these issues, companies must foster cross-functional collaboration, build internal capabilities, and integrate sustainability into core business strategies.

From a theoretical perspective, the study demonstrates the value of integrating the Resource-Based View, Institutional Theory, and Circular Economy Theory to understand managerial challenges. This integrative framework provides a comprehensive lens for analysing both internal and external factors influencing sustainable material adoption.

In conclusion, achieving effective implementation of sustainable materials in fashion design requires a holistic and systemic approach. Managers must adopt long-term strategies, invest in innovation, strengthen supply chain transparency, and engage consumers in sustainability initiatives. Future research should focus on empirical validation and explore context-specific solutions to support the transition toward a more sustainable fashion industry.

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