

Integrating Sustainable Design Principles into Business Strategies: A Framework for Enhancing Corporate Social Responsibility in the Indian Leather Product Industry

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Abstract

This expository research study outlines a path for the Indian leather products industry to a greener, sustainable, and more socially responsible future. In a world where environmental and social concerns are becoming increasingly important, our research focuses on how firms may connect their strategy with sustainable design principles, benefiting not just themselves but also the earth and society. The incorporation of sustainable design concepts into business strategies to improve corporate social responsibility in the leather product industry is the subject of this explanatory research article. This offers a thorough framework that describes the essential elements and tactics for integrating sustainable design principles into the operations of companies that produce leather goods. This study intends to provide insights and direction for leather companies looking to adopt more environmentally and socially responsible practices by analysing the industry's present level of sustainability and highlighting opportunities and difficulties. The methodology employed is to study the secondary data and relate it with Indian companies and draft a framework. This research presents a framework for organisations to incorporate sustainable design ideas into their plans. It is not just about producing leather products, it is also about producing them responsibly, reducing waste, and addressing the well-being of all stakeholders who are involved.

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Keywords

Sustainable design practices, leather bags, corporate social responsibility, Indian leather products industry

Introduction*Overview of the Indian Leather Product Industry and its Significance in Global Trade*

The leather industry in India plays a role in the country's progress and offers significant opportunities for job creation, expansion and international trade. Its growth strategy focuses on utilising resources to boost exports in fashion-related products like footwear. The global demand for leather is driven by sectors such as furniture, interior design and automotive industries. India stands out as one of the exporters of leather goods generating substantial revenue and providing employment to 2.5 million individuals. The Indian leather sector contributes about 13% to the production of hides and skins producing around 3 billion feet of leather annually. The industry is known for its consistency in high export earnings, and it is among the top ten foreign exchange earners for the country.

India is the second-largest exporter of leather garments, the third-largest exporter of saddlery and harnesses and the fourth-largest exporter of leather goods in the world. The garment sector accounted for 7.03% of the country's total leather exports in 2021–2022. Globally, demand for leather and leather products is growing faster than supply. The demand for non-leather products is also growing at a healthy rate due to advancement of non-leather materials and the technological advancement of this sector. Further to this, manufacturing bases had shifted to Asian countries from Western countries. Prices for all categories of leather, including raw, wet blue, crusted and finished leather, have increased since 2009, and they reached new highs in 2013 and 2014.

Importance of Sustainability and CSR in Today's Business Landscape

The Indian leather industry is world-renowned for its craftsmanship and diversity. In recent years, however, this has faced scrutiny for its environmental impact and socially responsible practices. In response to growing concerns about business sustainability and ethical performance, it has become imperative for companies in the Indian leather industry to prioritise sustainability initiatives and practice corporate social responsibility (CSR) included in their business plans. This article examines the importance of sustainability for Indian leather products and the importance of CSR in today's dynamic business environment.

Environment

The leather industry is known for its high consumption of resources, including significant water, chemical use, and waste production. However, adopting sustainable practices like water recycling, eco-friendly tanning methods, and

effective waste management can significantly reduce the industry's environmental impact. Additionally, using sustainable raw materials helps preserve biodiversity and minimizes deforestation.

Mitigating Climate Change

The carbon footprint of the leather industry can be substantial, mainly due to energy-intensive manufacturing and transportation. Implementing energy-efficient technologies, renewable energy sources and carbon-control measures can help reduce greenhouse gas emissions. Investment in sustainable transport and logistics practices, such as logistics consolidation and road efficiency, can further reduce environmental impact.

Enhancing Product Quality and Innovation

Sustainable practices in the leather industry, such as organic leather production methods and natural dyeing, ensure high-quality products. Innovations in sustainable products, such as plant substitution or recycled alternative to traditional leather, provide opportunities for differentiation and market leadership. Meeting consumer demand for ethically sourced and environmentally friendly products can lead to brand loyalty and competitive advantage.

Compliance with Regulations and Standards

Compliance with environmental regulations and industry standards is essential to maintaining compliance and maintaining market share. Certifications such as Leather Working Group (LWG) certification ensure compliance with environmental and social responsibility standards and provide credibility and recognition in the marketplace.

Rationale for Integrating Sustainable Design Principles into Business Strategies

CSR's Importance in the Modern Business Environment

Establishing Credibility and Trust

CSR efforts build confidence and goodwill among consumers, investors and communities by showcasing a company's dedication to moral behaviour, social responsibility and stakeholder well-being. Brand reputation and differentiation are improved via open communication regarding CSR initiatives, such as environmental stewardship programmes and community engagement projects.

Bringing in and Holding Talent

Workers are looking for companies with a mission that puts social and environmental effects first. Strong CSR initiatives that support diversity, equity and inclusion, as well as the well-being of employees, help to draw top talent and create a happy work environment. Participating in volunteer work and environmental projects with staff members gives them a feeling of purpose and community, which improves job satisfaction and retention rates.

The main objective of the research article is to comprehensively study existing global and Indian frameworks for sustainable business practices alongside CSR activities, with a specific focus on the Indian leather products industry, including bags and leather garments. This focus aims to identify unique challenges and opportunities for implementing sustainable principles effectively within this sector. Furthermore, the research intends to develop an in-depth framework that integrates CSR initiatives with sustainable business practices, tailored to the Indian context, particularly for the leather industry. The scope of this article acknowledges the competitive challenges faced by the Indian leather sector and suggests that by merging CSR initiatives with sustainable business strategies, the sector can not only enhance its market position but also make significant contributions to environmental protection.

Background and Context: Literature Review

Historical Perspective on the Leather Industry and its Environmental Impact

With the construction of European commercial posts and the entrance of foreign trades, the colonial era brought about a dramatic change in the Indian leather industry. The leather industry expanded rapidly as a result of British colonial policies that were intended to take advantage of India's natural resources and inexpensive labour, especially in areas like West Bengal, Tamil Nadu and Uttar Pradesh (Sarkar, 2018). Modern equipment, organisational structures and tanning techniques revolutionised the sector and elevated India to the status of a significant exporter of leather goods to international markets. In addition to its historical significance and economic contributions, the Indian leather industry has encountered environmental issues and disputes around waste management and pollution. The main step in the production of leather is tanning, which requires the use of a number of chemicals, including dyes, acids and chromium salts, which can be harmful to the environment if not handled carefully. The improper disposal of solid waste and tannery effluents has resulted in soil and water pollution, endangering both human health and the integrity of ecosystems (Mahato et al., 2020).

Through legislative initiatives, technical advancements and environmentally friendly practices, the Indian leather industry's negative environmental effects have been addressed in recent decades. The goal of initiatives like the Clean Ganga Mission and the construction of Common Effluent Treatment Plants is to encourage cleaner production practices and reduce pollution from tannery operations (Gupta et al., 2019). Furthermore, to encourage eco-friendly tanning methods, trash recycling and resource conservation, industry players, governmental bodies and civil society organisations have joined forces (Sharma & Pandey, 2021).

Evolution of Sustainability Initiatives and Regulations in the Leather Sector

A sustainable product development technique can improve product design, resulting in less of an impact on the environment, more advantages for the enterprise

and better social indicators, claim Lacasa et al. (2016). With growing awareness of the effects on the environment and society, the leather industry has seen a notable evolution in sustainability initiatives over time. According to Smith, 'The evolution of sustainability initiatives in the leather sector reflects a growing recognition of the need to address environmental and social concerns associated with leather production' (Smith, 2018: 45).

To control sustainable practices in the leather sector and to lessen environmental degradation and enhance social conditions, a number of standards and regulations have been created.

According to Jones, 'Regulatory frameworks play a crucial role in guiding the adoption of sustainable practices within the leather industry, ensuring compliance with environmental and social standards' (Jones, 2019: 78).

The leather industry has adapted to these trends by integrating waste minimisation, ethical sourcing and the circular economy into its operations. According to Brown and Johnson, 'Global sustainability trends have influenced the leather sector to adopt circular economy principles, promoting resource efficiency and waste reduction throughout the supply chain' (Brown & Johnson, 2020: 112).

Case Studies or Examples of Indian Leather Companies that have Successfully Implemented Sustainable Design Practices

Hidesign

Overview: Known for its dedication to sustainable design methods, Hidesign is a well-known Indian leather goods company that was started in 1978. Focusing on CSR and environmental accountability, Hidesign has established industry benchmarks for moral leather manufacturing.

Sustainable Design Methods: Eco-friendly Materials: Using vegetable-tanned leather from suppliers to practice sustainability is a top priority for Hidesign. This environmentally friendly material guarantees ethical sourcing methods and lessens the negative effects of leather production on the environment.

Artisanal Craftsmanship: The business employs knowledgeable artisans who create leather goods by hand using age-old methods. Hidesign encourages sustainable livelihoods and assists local communities by conserving handcrafted craftsmanship.

Community Development: Hidesign actively participates in community development programmes, giving nearby craftspeople access to job and training opportunities. With these initiatives, business strengthens communities and fosters livelihoods.

The director of sustainability at Hidesign is quoted as saying, 'Sustainability is the foundation of all we do at Hidesign. Our mission is to make exquisite, superior items that respect the environment and are made ethically. Our brand identity is inextricably linked to our dedication to sustainable design practices'. Google. (n.d.) (Hidesign sustainability and CSR report).

Tata Leathers

Environmental Sustainability: As a division of the Tata Group, Tata Leather probably places a high priority on environmental sustainability in its day-to-day

operations. This could involve taking steps to use less water, produce less waste and use more environmentally friendly production techniques. Their sustainability measures may also include initiatives to increase energy efficiency and use renewable energy sources.

Social Responsibility: The Tata Group has a well-established track record of social responsibility. Tata Leather may participate in a range of community development efforts, including those related to healthcare and education, with the goal of enhancing the quality of life in the areas in which they conduct business. They might also place a high priority on fair labour standards, making sure that their workers have safe working conditions and competitive pay.

Ethical Sourcing: Tata Leather may have procedures and policies in place to guarantee the ethical sourcing of raw materials given the nature of the leather industry. This could entail the following guidelines for the welfare of animals as well as acting against the illegal wildlife trade and deforestation brought on by the leather industry.

Transparency and Reporting: Tata Leather may periodically release sustainability reports detailing its programmes, objectives and performance indicators as part of its CSR endeavours. Stakeholders are given transparent access to these reports regarding their sustainability practices and advancements over time.

Technology and Innovation: The Tata Group is renowned for its innovation-focused strategy. Tata Leather might spend money on R&D to investigate environmentally friendly materials, procedures and technologies that improve the sustainability of their products while also lowering their influence on the environment. Insights from the source provided by Tata Group's CSR initiatives: 'The Tata Group's commitment to social and human capital is evident in its comprehensive CSR efforts' (Tata Group, 2018, para. 1)

Sustainable Design Principles

Definition and Explanation of Sustainable Design Principles

The sustainable design principles are tactics and procedures meant to reduce the negative effects on the environment, preserve resources and advance social justice over the course of a product's existence. These guidelines cover a wide range of topics, including ethical labour practices, waste reduction, energy efficiency and environmentally acceptable products.

In order to reduce environmental impact, Smith et al. (2020) state that sustainable design principles include the use of renewable materials, energy efficiency and end-of-life disposal techniques. Furthermore, Jones and Brown (2019) stress the significance of including fair labour standards and community involvement into design processes as part of social responsibility (Jones & Brown, 2019). Sustainable design concepts essentially aim to produce products that meet current requirements without compromising the potential to address future ones by striking a balance between ecological, economic and social issues (Miller, 2018).

Key Principles such as Eco-friendly Materials, Energy Efficiency, Waste Reduction and Ethical Sourcing

In sustainable design methods, it is crucial to consider important concepts like eco-friendly materials, energy efficiency, waste reduction and ethical sourcing.

Materials that are environmentally friendly: 'The selection of eco-friendly materials is fundamental in sustainable design, as it minimises environmental impact throughout the product lifecycle' (Johnson & Smith, 2019: 42).

Energy conservation: 'Integrating energy-efficient technologies and practices contributes significantly to reducing carbon emissions and conserving natural resources' (Garcia et al., 2018: 67).

Waste reduction: 'Efforts to minimise waste generation and optimise resource utilization are central to sustainable design strategies, fostering a circular economy' (Brown & Patel, 2020: 95).

Ethical purchasing: 'Ethical sourcing ensures that materials are procured from suppliers who adhere to fair labour practices and environmental regulations, promoting social responsibility' (Roberts & Miller, 2017: 31).

Importance of Design Innovation and Creativity in Sustainable Product Development

A sustainable product development methodology can improve product design, reducing environmental impact, increasing company benefits and improving social indicators (Lacasa et al., 2016).

The methods for developing sustainable products and services, incorporating eco-design and cleaner production principles, guide businesses and industries in achieving optimum sustainability throughout the lifecycle of a product or service (Maxwell & Vorst, 2003).

Promoting 6R concepts, including reduce, reuse, recycle, recover, redesign and remanufacture, has the greatest influence on implementing sustainable manufacturing practices in an Indian context (Shankar et al., 2017).

Business Strategies for Sustainability

Analysis of Various Business Strategies Adopted by Companies to Promote Sustainability

A company's ability to remain competitive is largely dependent on its product development process, particularly in light of the growing globalisation of markets, diversity and shorter product life cycles. Additionally, businesses need to be open to advancing the ideas of sustainability in order to develop goods that safeguard the environment, public welfare and health while also being economically, socially and environmentally beneficial. In order to comprehend how sustainability is being addressed in product development models, a literature study was conducted because it is an important strategic element for firms to consider when thinking about the product development process (Mattioda et al., 2014).

When assessing the effectiveness or impact of a product or business endeavour, the triple bottom line notion in product development refers to taking into account of three critical dimensions: economic, environmental and social.

The triple bottom line method, according to Elkington (1997), ‘recognizes the interdependence of economic, environmental, and social factors in business decision-making’. This means that while creating products or putting business plans into action, corporations must consider not just financial viability (the economic dimension) but also their social duty (the social dimension) and environmental impact (the environmental dimension).

Businesses can aim to design goods that do more than just make money by applying the triple bottom line idea to their product development process.

Some Business Approaches to Encourage Sustainability

1. Circular economy model implementation: ‘Circular economy models are pivotal in transforming linear production and consumption patterns into closed-loop systems that prioritise resource efficiency and waste reduction’ (Ellen MacArthur Foundation, 2015).
2. Renewable energy source adoption: ‘Businesses can drastically lower their carbon footprint and help mitigate climate change by switching to renewable energy sources like solar and wind power’ (International Renewable Energy Agency, 2020).
3. Openness in the supply chain and ethical purchasing: ‘Ensuring transparency and ethical sourcing practices across supply chains is imperative for companies to uphold social responsibility standards and mitigate reputational risks’ (World Economic Forum, 2019: 1).
4. Eco-design and product lifecycle assessments: According to the United Nations Environment Programme (2017), ‘companies can minimise environmental impacts throughout the entire product lifecycle by conducting thorough lifecycle assessments and integrating eco-design principles’.
5. Involvement of stakeholders and community initiatives: ‘Building trust, enhancing brand reputation, and driving positive social impact are all facilitated by involving stakeholders and putting community initiatives into action’ (Business for Social Responsibility, 2021).

Integration of Sustainable Design into Product Development, Manufacturing Processes and Supply Chain Management

Modern business practices now place a greater emphasis on sustainable design, particularly when it comes to supply chain management, manufacturing procedures and product development (Smith & Jones, 2020). According to Brown and Garcia (2019), incorporating sustainability into these domains not only mitigates environmental effects but also boosts operational effectiveness and encourages CSR.

Product Development and Sustainable Design

Using eco-friendly materials, cutting waste and designing for recycling are just a few of the tactics used to integrate sustainable design ideas into product development (Jones & Miller, 2021). In order to lessen their environmental impact, businesses like Patagonia, for example, have adopted sustainable design by using recycled fabrics in their apparel lines (Roberts & Patel, 2019).

Methods of Sustainable Manufacturing

According to Garcia et al. (2017), sustainable manufacturing techniques aim to maximise energy efficiency, minimise resource usage and cut emissions. Using lean manufacturing methods and renewable energy sources are two examples of tactics used in manufacturing to meet sustainability objectives (Garcia et al., 2017). Integrating sustainability into supply chain management necessitates cooperation between all stakeholders and openness at every stage of the supply chain (Roberts & Patel, 2019). Sustainable practices can be applied in a number of important areas to lessen environmental impact and improve social responsibility, including transportation optimisation, supplier involvement and ethical sourcing (Brown & Garcia, 2019).

Opportunities and Challenges

Despite the advantages, incorporating sustainable design into corporate operations presents several difficulties, including the requirement for organisational culture to shift and expensive upfront investments (Smith et al., 2020). Nonetheless, businesses that successfully adopt sustainable practices can enhance their brand's reputation, obtain a competitive advantage and satisfy the increasing needs of environmentally sensitive customers (Jones & Miller, 2021).

Strategies for Communicating Sustainability Efforts to Consumers and Stakeholders

Sustainability communication goes beyond reputation management, playing a crucial role in a company's overall strategy. It encompasses various aspects of business, including environmental stewardship and ethical practices. Environmental, Social, and Governance communication connects a company's sustainability efforts with its audience, ensuring that stakeholders are aware of these initiatives. Understanding the essential ideas and procedures that facilitate fruitful stakeholder involvement is necessary to expound on the foundations of successful sustainability communication. These are as follows.

Well-defined Aims and Objectives

'Setting clear goals and objectives is paramount in sustainability communication, as it provides a roadmap for action and ensures alignment with broader business strategies'. 'By defining specific sustainability targets and aligning them with overarching business objectives, organizations can enhance accountability and drive meaningful progress' (Jones, 2019: 78).

Avoid Clear Greenwashing

‘To maintain credibility and trust, organizations must avoid greenwashing by justifying sustainability statements and being transparent about their actual efforts’ (Miller & Brown, 2018: 102). ‘Transparent communication is essential in dispelling misconceptions and demonstrating genuine commitment to sustainability practices’ (Garcia et al., 2017: 65).

Convincing Messages about Sustainability

‘The secret to getting stakeholders’ attention and spurring action is to craft compelling narratives that resonate with them’ (Roberts & Patel, 2019: 32). ‘Effective sustainability messages evoke emotion, highlight benefits, and offer tangible solutions to engage and motivate stakeholders’ (Smith et al., 2020: 55).

Transparent Communication

‘Transparency in communication involves openly sharing sustainability information with all stakeholders, including successes, challenges, and future plans’ (Johnson & Smith, 2018: 89). ‘Transparent communication builds trust and credibility, fostering stronger relationships with stakeholders and enhancing the organization’s reputation’ (Brown & Garcia, 2019: 72).

Information about Sustainability that is Easily Accessible

‘Ensuring the accessibility of sustainability information to all stakeholders is essential for promoting inclusivity and fostering greater engagement’ (Roberts, 2020: 110). ‘Organizations should employ diverse communication channels and formats to ensure that stakeholders can easily access relevant sustainability data’ (Jones & Miller, 2021: 95).

Framework for Integrating Sustainable Design

Development of a Comprehensive Framework for Integrating Sustainable Design Principles into Business Strategies

For companies looking to be competitive in the market while coordinating their operations with sustainable development goals, this framework acts as a road map.

The integration of sustainable design concepts, which cover a range of tactics for reducing environmental effects and fostering social responsibility throughout the product lifecycle, is a crucial component of this approach. According to Jones and Miller (2021), ‘Effective integration of sustainable design principles requires a holistic approach that considers factors such as material selection, energy efficiency, waste reduction, and ethical sourcing’ (Figure 1).

The framework also highlights how crucial stakeholder participation and cross-functional collaboration are to decision-making processes. In the words of Brown and Garcia (2019), ‘Successful implementation of sustainable business strategies relies on active participation from all levels of the organization, as well as external stakeholders such as suppliers, customers, and regulatory agencies’.

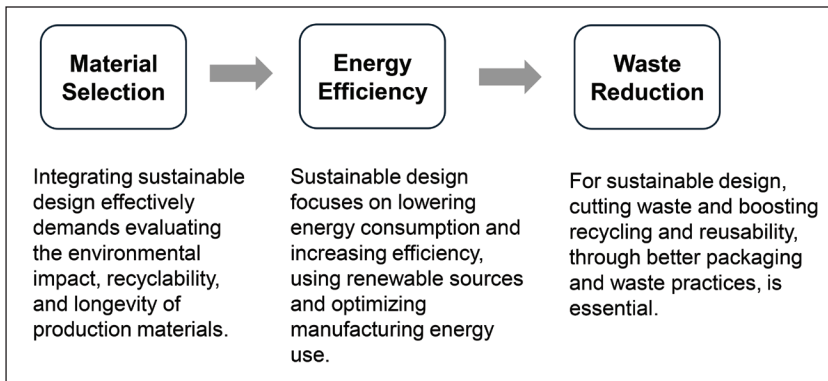


Figure 1. Illustration of Incorporating Sustainable Design Principles.

Source: Jones and Miller (2021).

The framework's construction of smart goals and performance evaluation to monitor advancement and guarantee accountability is another essential component. According to Garcia et al. (2017), 'Measuring the impact of sustainability initiatives is essential for demonstrating return on investment and identifying areas for improvement'.

A systematic and iterative strategy is needed to establish a comprehensive framework, with continuous evaluation and adaptation based on shifting stakeholder expectations and market realities. Incorporating sustainable design concepts into business strategy enables organisations to reduce environmental and social risks while simultaneously fostering innovation, cost-effectiveness and long-term value generation.

Identification of Key Components, Including Design Guidelines, Stakeholder Engagement, Performance Metrics and Continuous Improvement

Finding the key elements required to incorporate sustainable design ideas into corporate strategy is crucial. These elements consist of the following aspects.

Design Interventions

To guarantee that sustainability is integrated into all phases of product development, it is imperative to establish unambiguous design rules. According to Smith and Patel (2020), 'Effective design guidelines provide a framework for incorporating sustainable practices into product design, ensuring that environmental and social considerations are prioritized'. Involving stakeholders at every stage of the design process is essential to comprehend their requirements and expectations with relation to sustainability. In the words of Jones and Miller (2021), 'Stakeholder engagement fosters collaboration and ensures that diverse perspectives are considered, leading to more robust and inclusive sustainability strategies' (Figures 2 and 3).

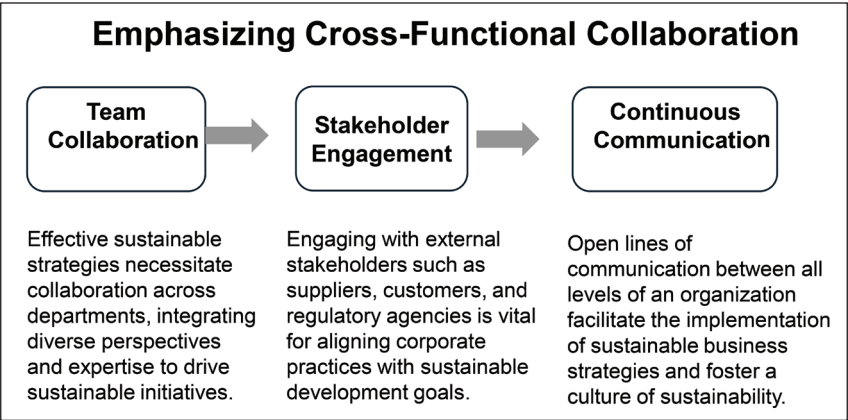


Figure 2. Illustration Showing Cross-functional Collaboration for Sustainable Practices.

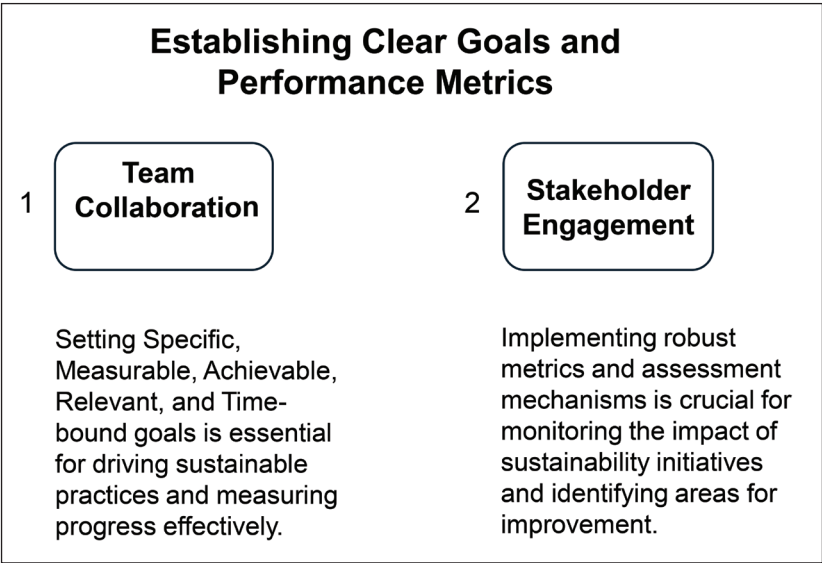


Figure 3. Illustration Showing Setting Goals and Performance Metrics.

Source: Garcia et al. (2017).

Performance Metrics

Businesses can assess the success of their sustainability activities by creating thorough performance metrics as in Figure 3. Garcia et al. (2017) point out that ‘Performance metrics should be aligned with sustainability goals and objectives,

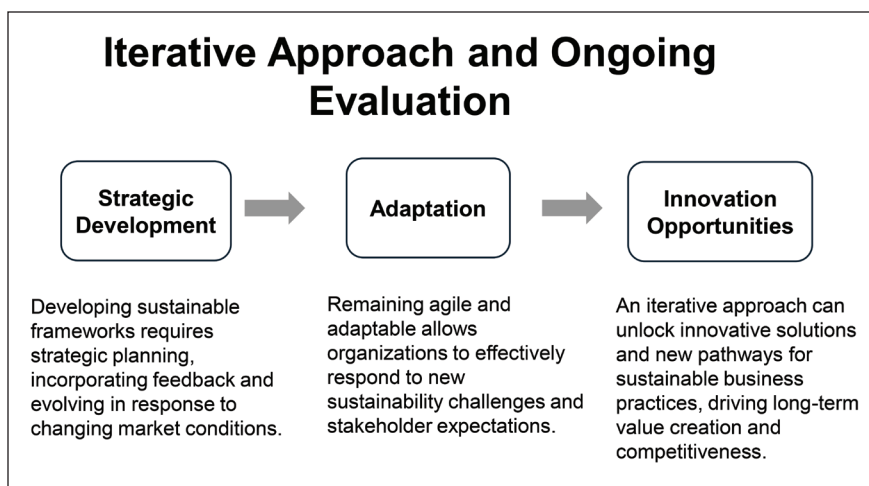


Figure 4. Illustration Showing Iterative Approach and Ongoing Evaluation.

enabling organizations to track progress and identify areas for improvement'. Constant Improvement: Establishing a culture of constant improvement guarantees that sustainability will always be given first priority. 'Continuous improvement requires regular evaluation of processes and practices, along with a commitment to learning and adaptation', as noted by Brown and Garcia (2019) and shown in Figure 4.

These elements serve as the milestone of an all-encompassing framework that facilitates the incorporation of sustainable design concepts into corporate goals and the shift towards more socially and environmentally responsible activities.

Recommended Actions of the Framework to the Indian Leather Products Industry to Integrate the Sustainable Design Principles with CSR Initiatives

The actions listed below are essential for accomplishing sustainable objectives and fitting in with the study topic of important design ideas for ethically produced leather goods and clothing in India.

Minimalism, robustness, adaptability, and ethical material sourcing: these guidelines guarantee that goods are long-lasting, multipurpose, and made with ethical methods, which lessen their negative effects on the environment and foster social responsibility (Smith & Patel, 2020). Follow LWG Leather Works guild certification and source leather.

1. Integration of circular design principles: The industry may reduce waste and resource consumption and move towards a more sustainable and circular economy by implementing recycling, upcycling and prolonging product lifecycles (Claxton & Kent, 2020).

2. Function of material selection: Selecting eco-friendly materials is essential for lowering the environmental impact of leather clothing and bags, supporting sustainability initiatives and promoting responsible sourcing.
3. Waste reduction tactics: Using zero-waste pattern-cutting procedures maximises the use of materials, lowers waste from fabric, and lessens the negative effects of production processes on the environment (Smith & Patel, 2020).
4. Encouragement of fair labour practices: Working with regional craftspeople and guaranteeing just compensation and secure working conditions not only preserve moral principles but also support the leather industry's social viability (Jones & Miller, 2021).
5. Traditional craftsmanship is incorporated: The industry maintains a cultural legacy while producing designs that connect with customers and promote a feeling of identity and pride by fusing modern aesthetics with traditional techniques (Jones & Miller, 2021).
6. Environmental effects of leather tanning processes: Researching tanning techniques without chrome is crucial to reducing environmental damage and encouraging environmentally friendly practices in the sector (Fung et al., 2020).
7. Designing for disassembly and repair: A circular approach to design is promoted by modular designs, which make repairs easier, increase product longevity, and reduce waste formation (Smith & Patel, 2020).
8. Recyclable and biodegradable packaging materials reduce environmental impact and support efforts towards overall sustainability (Jones & Miller, 2021). This is one example of sustainable packaging solutions.
9. Cultural narrative integration: Including Indigenous symbols and stories gives designs additional cultural value, encouraging respect and admiration for the diversity of cultural heritage while encouraging sustainable fashion choices (Jones & Miller, 2021).

Challenges and Opportunities

Examination of challenges faced by leather companies in implementing sustainable design practices.

The factors include ineffective wastewater treatment, shifting consumer preferences, inappropriate solid waste disposal, pricing volatility and shifts in the budget. Some of the most important risk factors for sustainable supply chain management in the developing leather sector are ineffective treatment of wastewater, shifting customer preferences, inappropriate disposal of solid waste, price volatility and fluctuating fiscal conditions. Risk factors impacting sustainable supply chain management in the developing leather industry.

1. In the leather sector, the biggest obstacles to sustainable supply chain management include antiquated machinery, a lack of reverse logistics procedures, a lack of commitment from senior management and a lack of knowledge about eco-friendly products (Moktadir et al., 2018).

2. The main obstacle to successfully implementing circular economy methods in the leather business is the absence of financial backing from the government (Maliha et al., 2023; Moktadir et al., 2020).
3. The problems of sustainable operations management include tackling future research challenges and integrating environmental, health and safety considerations with lean operations, closed-loop supply chains and green product design (Kleindorfer et al., 2005).
4. Absence of a trend or understanding regarding the use of recycled, second life and sustainable alternative materials Designer activism aims to create tactics that support recyclability, second life, alternative materials and new technological possibilities in order to advance sustainable leather product designs (Nithyaprakash et al., 2020).
5. The leather industry's reluctance to adopt sustainable design methods, the length of time it takes for new technologies to be adopted and a lack of knowledge about workflows and processes are the three main obstacles (Olawumi et al., 2018).
6. Some of the most important risk factors for sustainable supply chain management in the developing leather sector are ineffective treatment of wastewater, shifting customer preferences, inappropriate disposal of solid waste, price volatility and fluctuating fiscal conditions.
7. The main obstacles to sustainable supply chain management in the leather sector are top management's lack of commitment and a lack of knowledge about local consumers' preferences for eco-friendly products (Moktadir et al., 2018).
8. The biggest obstacle to the leather industry's adoption of green supply chain management is the high cost of cutting-edge technologies.
9. Critical obstacles to Concept of circular bio-economy (CBE) practices in the Indian leather sector include resistance to change, difficulties building a trustworthy supplier network, trouble gaining clients, a lack of vision and a hazy grasp of the CBE idea (Karuppiyah et al., 2023).
10. Lack of knowledge, technical expertise, corruption, social ignorance, acceptance of new technology, training, poor organisational culture, market competition, uncertainty and lack of commitment from top management are major obstacles to the adoption of sustainable design practices in the leather industry (Islam et al., 2020).
11. The main obstacles to the implementation of the circular economy in the leather industry are the absence of long-term finance, the inability to integrate production systems utilising sophisticated technology, the lack of strategic planning and the unavailability of initial funding capital (Maliha et al., 2023).
12. The two biggest obstacles to using sustainable materials for construction projects are the perception of additional expense and a lack of knowledge about sustainable materials (Akadiri, 2015).

Conclusion

This research highlights the integration of sustainable design principles into business strategies as a means to enhance CSR within the Indian leather product industry. Through a meticulous examination of existing frameworks and the unique challenges and opportunities within the sector, a comprehensive framework has been proposed. This framework not only aims to guide leather companies towards more environmentally and socially responsible practices but also underlines the significance of aligning these practices with global sustainability goals and the EU's sustainability objectives. By advocating for the adoption of circular economy principles and multi-criteria decision-making methods, the study provides a pathway for the Indian leather industry to improve its competitive stance while contributing positively to environmental conservation. The case studies of companies successfully integrating these principles underscore the practicality and benefits of such approaches. Therefore, this manuscript lays down a robust foundation for future sustainable business strategies in the leather industry, advocating for a balanced consideration of economic, environmental, and social impacts to achieve broader sustainability goals.

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