INTERNATIONAL JOURNAL FOR INNOVATIVE RESEARCH IN MULTIDISCIPLINARY FIELD
ISSN(O): 2455-0620 [Impact Factor: 9.47]
Monthly, Peer-Reviewed, Refereed, Indexed Journal with IC Value : 86.87
Volume - 12, Issue - 1, January - 2026

DOIs:10.2015/IJIRMF/202601010 --:-- Research Paper / Article / Review

Ethical Design Approaches in Handloom and Textile Design: Integrating Tradition, Ethics, and Circularity

Anil Kumar
Assistant Professor, Department of Textile,
Dada Lakhmi Chand State University of Performing & Visual Arts Rohtak (HR), India
Email - anilvns143@gmail.com

Abstract: *Handloom and textile design play a vital role in cultural heritage, artisanal livelihoods, and sustainable development. In response to environmental degradation and the challenges posed by fast fashion, this study examines sustainable design strategies for handloom and textile designers that strike a balance between aesthetics, functionality, and sustainability. The research highlights eco-conscious material selection, ethical production practices, and circular design approaches, including the use of natural fibres, low-impact dyeing, energy-efficient weaving, and waste reduction. Emphasis is also placed on fair labour practices, community collaboration, and consumer awareness. By integrating traditional knowledge with contemporary sustainability goals, the study proposes a framework that supports environmental responsibility and artisan empowerment, contributing to a slow and regenerative textile economy aligned with key Sustainable Development Goals.*

Key Words: *Handloom, Textile design, Sustainable design strategies, Eco-conscious materials, Ethical production practices, Circular design, Fast fashion, Artisan livelihoods, Traditional knowledge, Sustainable Development Goals (SDGs).*

1. INTRODUCTION:

The textile industry is one of the most resource-intensive sectors, contributing significantly to various types of pollution, including water, noise, and carbon emissions (Ellen MacArthur Foundation, 2017). In contrast to the handloom industry of India, Bangladesh, and some parts of Southeast Asia, which offers a more sustainable alternative rooted in low-energy production, natural materials, and cultural heritage (Mukherjee, 2020). However, even traditional crafts are under pressure from fast fashion, unsustainable supply chains, and a lack of innovation in design processes. To ensure the long-term viability of handloom practices, there is a growing need to develop and implement sustainable design strategies that integrate environmental responsibility, ethical labour practices, and economic viability. Sustainability in textile design involves considering the life cycle of a product from raw material sourcing and production to use, reuse, and end-of-life disposal (Fletcher, 2014). For handloom designers, which means balancing creativity with ecological and social concerns, often within the constraints of traditional practices and rural economies. This challenge also presents an opportunity: the inherently low-carbon and artisanal nature of handloom weaving aligns well with many principles of sustainable design, such as slow production, circularity, and community-centred development (Khodabandelou, 2018).

Despite this alignment, sustainable design remains underutilised in many handloom contexts due to limited access to resources, design education, market infrastructure and sustainable Design awareness. Designers play a critical role in bridging this gap by adopting strategies such as the use of natural or recycled fibres, plant-based dyes, zero-waste weaving techniques, and collaborative development with artisans (Gwilt, 2011). Additionally, transparent communication and storytelling can add value to handloom products, helping consumers understand their environmental and cultural significance.

2. SUSTAINABLE TEXTILE DESIGN:

Design is the creation of a systematic plan or methods for the construction of a two or three-dimensional objects, system, or measurable human interaction (as in architectural blueprints, engineering drawings, business processes, circuit diagrams, and sewing patterns).

A designer is a person who designs objects. In practice, anyone who creates tangible or intangible objects, products, processes, laws, games, graphics, services, and experiences is referred to as a designer. Designers, as primary decision-makers in the early stages of textile development, play a critical role in embedding sustainability into their creative and technical processes.

Sustainability in the textile and fashion industry has evolved significantly in recent decades, driven by increasing awareness of environmental degradation, ethical concerns, and resource scarcity. The handloom/Textile designer emphasised sustainable alternatives to mass production and fast fashion. Within this broader framework, handloom and traditional textile production emerge as inherently sustainable practices that offer valuable insights and pathways for rethinking modern design strategies.

Sustainable textile design is grounded in the principles of reducing environmental impact across a product's life cycle—from fibre sourcing and production to consumption and disposal (Fletcher, 2014). It emphasizes material efficiency, ethical labor, water and energy conservation, and the use of biodegradable or recyclable materials (Gwilt, 2011). There are various components of design that make it good for the end user like aesthetic, functional, economic, and social and political, all of which need to be study properly for making sustainable design strategies for handloom and Textile products.

3. DESIGN STAGES:

- **Pre-production design:**

- A design brief is an early statement that defines the goals and direction of the design.
- Analysis involves examining and evaluating the current design goals.
- Research is an in-depth investigation of design solutions related to the selected field or topic.
- The specification provides detailed information about the design that is intended for reproduction.
- Problem-solving focuses on conceptualising and documenting effective design solutions.
- Presentation involves clearly communicating and showcasing the proposed design solutions.

- **Design Production Process:**

The design phase continues actively into the production process, where conceptual ideas are translated into tangible outcomes. This stage ensures that the designed solution is not only aesthetically and functionally sound but also feasible, efficient, and sustainable within real production conditions.

- **Development:**

Development involves the continuation and systematic improvement of the proposed design solution. During this phase, refinements are made based on material availability, production techniques, and sustainability considerations. For handloom and textile design, this may include adjusting weave structures, optimising material use, or refining colour applications to reduce waste and energy consumption while maintaining design integrity.

- **Testing:**

Testing is conducted through in situ or real-world application of the designed solution. This stage evaluates performance, durability, user comfort, and environmental impact under actual production and usage conditions. Feedback from artisans, producers, and users plays a crucial role in identifying practical challenges and ensuring that the design meets functional, cultural, and sustainability requirements.

- **Post-Production Design Feedback:**

Post-production feedback is an essential stage that assesses the effectiveness of the design after implementation. It supports continuous improvement and reinforces a circular and reflective design approach.

- **Implementation:**

Implementation refers to the introduction of the finalised design solution into its intended environment, such as the market, community, or production system. In the handloom and textile sector, this stage often involves collaboration with artisans, integration into existing production practices, and alignment with market demands while preserving ethical and sustainable values.

- **Evaluation and Conclusion:**

Evaluation involves a comprehensive review of the entire design process and its outcomes. This includes assessing environmental performance, user satisfaction, production efficiency, and social impact. Constructive criticism is encouraged to identify strengths, limitations, and opportunities for enhancement. The conclusions drawn provide insights into the effectiveness of the design strategy and its contribution to sustainability goals.

- **Redesign:**

Redesign is an iterative process in which any or all stages of the design process may be revisited and modified. Corrections and improvements can be made before, during, or after production based on evaluation findings or changing

contextual needs. This flexible approach supports innovation, adaptability, and long-term sustainability in textile design practice.

4. PROBLEMS WITH THE SUSTAINABILITY OF THE HANDLOOM:

- **Environmental Impact**

The textile industry is the world's most polluted, as it consumes large amounts of water, energy, and chemicals, while generating hazardous waste and contributing to greenhouse gas emissions.

Key Issues:

- Water Pollution: Textile dyeing is the second-largest polluter of water globally (Kant, 2012). Untreated wastewater from dyeing processes pollutes rivers and ecosystems.
- **Overuse of Resources**: Producing one cotton shirt requires approximately 2,700 litres of water (WWF, 2013).
- **Synthetic Materials:** Synthetic materials used during multiple stage of production like polyester, release microplastics during washing, which are polluting oceans and harming marine life (Napper & Thompson, 2016).

- **Over production and Waste**

Fast fashion encourages mass production and consumption, leading to high volumes of textile waste.

Key Issues:

- Clothing production doubled between 2000 and 2015, while garment use lifespan decreased (Ellen MacArthur Foundation, 2017).
- Millions of tons of textile waste are sent to landfills or incinerated each year, contributing to pollution and loss of resources.

- **Social Injustice and Labour Exploitation**

Sustainability also includes social equity, which the industry often overlooks.

Key Issues:

- Garment workers in developing countries often face poor working conditions, low wages, and exploitation (Clean Clothes Campaign, 2020).
- Lack of transparency in supply chains makes it difficult to enforce labour rights and ethical standards.

- **Barriers to Sustainable Change**

Despite innovations and awareness, sustainable practices face challenges in widespread adoption.

Key Issues:

- Higher costs of sustainable materials and ethical labor practices deter many brands.
- Lack of consumer awareness or willingness to pay for sustainable alternatives.
- Fragmented and opaque global supply chains make monitoring and regulation difficult (Niinimäki et al., 2020).

- **Fast Fashion**

Fast fashion has revolutionised the global clothing market, but at a high environmental and human cost. As evidence of its negative impact grows, the need for sustainable practices becomes more urgent. Both industry and consumers must transition toward ethical and environmentally conscious models of fashion production and consumption.

5. SUSTAINABLE APPROACHES IN HANDLOOM:

- **Handloom as a Sustainable Alternative:**

The handloom sector, particularly in countries such as India, Nepal, and Bangladesh, is often recognised as a low-carbon, low-impact textile system. Handloom weaving uses minimal electricity, relies on manual skills, and typically employs natural fibers like cotton, silk, and wool (Mukherjee, 2020). It also preserves cultural heritage and provides livelihoods in rural and marginalised communities. According to Das (2019), handloom practices align closely with the ideals of "slow fashion," promoting thoughtful consumption and local production.

However, despite its sustainable potential, the handloom sector faces challenges such as poor market access, design stagnation, and the lack of structured sustainability strategies (Chakraborty & Basu, 2018). Many artisan communities operate within traditional models that do not always align with contemporary sustainability frameworks or market expectations.

- **Designer's Role in Sustainable Transformation**

Designers are increasingly being viewed as change agents in driving sustainability within the textile value chain. According to Gwilt (2014), design decisions account for up to 80% of a product's environmental impact, making the designer's role central to sustainability efforts. This includes choices related to fibre selection, dyeing processes, weaving techniques, and product end-of-life considerations.

In the context of handloom, designers who work collaboratively with artisans can introduce innovations such as zero-waste patterns, modular designs, and natural dye applications while preserving the authenticity of traditional weaving

(Sharma & Jain, 2021). Furthermore, the concept of "design for circularity" is gaining traction, wherein designers are encouraged to envision products with extended lifespans, reusability, and recyclability (Ellen MacArthur Foundation, 2017).

- **Eco-Materials and Traditional Knowledge**

The choice of materials is a crucial aspect of sustainable textile design. Studies highlight the importance of sourcing organic and local fibres, as well as using low-impact or natural dyeing techniques to reduce environmental harm (Fletcher & Tham, 2019). Additionally, the integration of indigenous knowledge systems—such as traditional plant-based dyeing, weaving patterns, and fibre processing—can contribute to both ecological sustainability and cultural resilience (Khodabandelou, 2018). However, there is a need to modernise certain aspects of these practices to meet global sustainability standards without diluting their traditional essence. As Prasad and Ray (2020) argue, sustainable innovation in traditional crafts must be both inclusive and adaptive, balancing market viability with artisanal integrity.

6. CONCLUSION :

Sustainable design in the handloom and textile sector is not just a trend but a necessity in addressing the environmental, cultural, and social challenges facing the industry today. By integrating eco-friendly materials, traditional craftsmanship, low-impact production techniques, and circular design principles, designers can create textiles that are both responsible and resilient. Handloom and textile designers hold a unique position to bridge heritage with innovation, preserving artisanal skills while embracing sustainable practices. Moving forward, collaboration with local communities, consumer education, and transparent supply chains will be essential to building a textile ecosystem that supports both people and the planet. Ultimately, sustainability in textile design is a holistic approach—one that values longevity, ethical responsibility, and the deep connection between craft and nature.

7. FUNDING SOURCES: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

REFERENCES:

1. Ellen MacArthur Foundation. (2017). A new textiles economy: Redesigning fashion's future. https://ellenmacarthurfoundation.org
2. Fletcher, K. (2014). Sustainable fashion and textiles: Design journeys (2nd ed.). Routledge.
3. Gwilt, A. (2011). A practical guide to sustainable fashion. Fairchild Books.
4. Mukherjee, S. (2020). Handloom industry in India: Prospects and challenges in the era of sustainability. *Journal of Textile and Apparel, Technology and Management, 11(4), 1–12.*
5. Chakraborty, S., & Basu, S. (2018). Challenges and opportunities in the Indian handloom industry. *Journal of Textile Science & Engineering, 8(4), 1–5.* https://doi.org/10.4172/2165-8064.1000364
6. Das, A. (2019). Reviving handloom: Sustainability and tradition in contemporary design. *Textile Value Chain Journal, 10(2), 26–30.*
7. Fletcher, K., & Tham, M. (2019). Earth logic: Fashion action research plan. The JJF.
8. Gwilt, A. (2011). A practical guide to sustainable fashion. Fairchild Books.
9. Gwilt, A. (2014). A practical guide to sustainable fashion (2nd ed.). Bloomsbury Publishing.
10. Khodabandelou, R. (2018). Cultural sustainability through textile crafts: Reviving heritage handlooms. *International Journal of Heritage Studies, 24(7), 733–748.* https://doi.org/10.1080/13527258.2018.1431411
11. Prasad, B., & Ray, R. (2020). Innovation and sustainability in traditional crafts: A design approach. International *Journal of Sustainable Development & World Ecology, 27(3), 230–240.*
12. Sharma, N., & Jain, A. (2021). Sustainable design strategies in Indian textile crafts: The designer's role. *Design and Culture, 13(1), 78–95.* https://doi.org/10.1080/17547075.2021.1879605
13. Clean Clothes Campaign. (2020). *Tailored Wages 2020: The state of pay in the global garment industry*. https://cleanclothes.org
14. Ellen MacArthur Foundation. (2017). *A new textiles economy: Redesigning fashion's future*. https://ellenmacarthurfoundation.org
15. Kant, R. (2012). Textile dyeing industry: An environmental hazard. *Natural Science, 4(1), 22–26.* https://doi.org/10.4236/ns.2012.41004
16. Napper, I. E., & Thompson, R. C. (2016). Release of synthetic microplastic fibres from domestic washing machines: Effects of fabric type and washing conditions. *Marine Pollution Bulletin*, 112(1-2), 39–45.https://doi.org/10.1016/j.marpolbul.2016.09.025
17. Niinimäki, K., Peters, G. M., Dahlbo, H., Perry, P., Rissanen, T., & Gwilt, A. (2020). The environmental price of fast fashion. *Nature Reviews Earth & Environment*, 1(4), 189–200. https://doi.org/10.1038/s43017-020-0039-9
18. WWF. (2013). *The Impact of a Cotton T-shirt*. https://www.worldwildlife.org