Integrating Circular Economy Practices to Enhance Sustainability in the Textile Industry: A Systematic Literature Review

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The textile and apparel industry is a central pillar of the global economy, employing over 60 million people worldwide. It is also among the most environmentally intensive sectors, responsible for approximately 8–10% of global greenhouse gas emissions. This impact is largely driven by a linear "take–make–dispose" model, marked by short production cycles, high resource consumption, and accelerated garment disposal. Circular economy (CE) strategies are gaining traction, yet recent research highlights eco-design as the most effective approach to reduce the sector's environmental footprint. Eco-design involves integrating durability, repairability, disassembly, recyclability, and low-impact materials at the design stage. Life-cycle assessments (LCA) indicate that doubling a garment's lifespan can cut its climate impact by up to 44%, and reusing one kilogram of clothing may prevent roughly 25 kilograms of CO_2-equivalent emissions. Policy is beginning to reflect this evidence. The European Union's proposed Ecodesign for Sustainable Products Regulation would require durability and recyclability for all textiles placed on the single market, signalling a shift toward design-led circularity. However, despite increasing interest, comprehensive analyses of eco-design implementation remain limited. Much of the literature focuses on individual materials or product types, rarely addressing systemic barriers, enabling conditions, or broader sustainability outcomes. To address this gap, this study conducts a systematic review of literature published between 2021 and 2025. The review draws exclusively from peer-reviewed journal articles indexed in Scopus and Web of Science. The SPAR-4-SLR framework ensures a rigorous, transparent, and replicable methodology for study identification, selection, and analysis. The review is guided by the following research question: Through which mechanisms are eco-design principles integrated into circular economy practices in the textile sector, and which organizational, technological, and regulatory factors influence implementation success?