

## **Exploring Closed-Loop Business Systems Which Eliminates Solid Waste in the Textile and Fashion Industry: A Systematic Literature Review Covering the Developments Occurred in the Last Decade**

**Authors :** Bukra Kalayci, Geraldine Brennan

**Abstract :** Introduction: Over the last decade, a proliferation of literature related to textile and fashion business in the context of sustainable production and consumption has emerged. However, the economic and environmental benefits of solid waste recovery have not been comprehensively searched. Therefore at the end-of-life or end-of-use textile waste management remains a gap. Solid textile waste reuse and recycling principles of the circular economy need to be developed to close the disposal stage of the textile supply chain. The environmental problems associated with the over-production and -consumption of textile products arise. Together with growing population and fast fashion culture the share of solid textile waste in municipal waste is increasing. Focusing on post-consumer textile waste literature, this research explores the opportunities, obstacles and enablers or success factors associated with closed-loop textile business systems. Methodology: A systematic literature review was conducted in order to identify best practices and gaps from the existing body of knowledge related to closed-loop post-consumer textile waste initiatives over the last decade. Selected keywords namely: 'cradle-to-cradle ', 'circular\* economy\* ', 'closed-loop\* ', 'end-of-life\* ', 'reverse\* logistic\* ', 'take-back\* ', 'remanufacture\* ', 'upcycle\* ' with the combination of (and) 'fashion\* ', 'garment\* ', 'textile\* ', 'apparel\* ', 'clothing\* ' were used and the time frame of the review was set between 2005 to 2017. In order to obtain a broad coverage, Web of Knowledge and Science Direct databases were used, and peer-reviewed journal articles were chosen. The keyword search identified 299 number of papers which was further refined into 54 relevant papers that form the basis of the in-depth thematic analysis. Preliminary findings: A key finding was that the existing literature is predominantly conceptual rather than applied or empirical work. Moreover, the enablers or success factors, obstacles and opportunities to implement closed-loop systems in the textile industry were not clearly articulated and the following considerations were also largely overlooked in the literature. While the circular economy suggests multiple cycles of discarded products, components or materials, most research has to date tended to focus on a single cycle. Thus the calculations of environmental and economic benefits of closed-loop systems are limited to one cycle which does not adequately explore the feasibility or potential benefits of multiple cycles. Additionally, the time period textile products spend between point of sale, and end-of-use/end-of-life return is a crucial factor. Despite past efforts to study closed-loop textile systems a clear gap in the literature is the lack of a clear evaluation framework which enables manufacturers to clarify the reusability potential of textile products through consideration of indicators related too: quality, design, lifetime, length of time between manufacture and product return, volume of collected disposed products, material properties, and brand segment considerations (e.g. fast fashion versus luxury brands).

**Keywords :** circular fashion, closed loop business, product service systems, solid textile waste elimination

**Conference Title :** ICSFDC 2017 : International Conference on Sustainable Fashion Design and Clothing

**Conference Location :** Istanbul, Türkiye

**Conference Dates :** July 27-28, 2017