Chapter 3
Waste Management and Recovery Practices in the Apparel Sector Through a Sustainable Approach

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ABSTRACT

The apparel sector, a key driver of global economic growth, confronts pressing challenges related to environmental sustainability. In view of that the current study explores into waste management and recovery practices within the industry, stressing arrangement with Sustainable Development Goal No. 17 viz. Partnerships for the Goals, aiming to address the ecological impact of apparel operations and promote the circular economy. The problem of waste generation in the apparel industry has been significant and requires a thorough investigation, considering the sustainable practices. Circular design principles, including lean manufacturing and the use of recyclable materials, are explored as strategies to minimize waste during production. The forefront of sustainable development in the apparel sector lies in waste recovery initiatives. The study also appraises the effectiveness of existing programs like take-back schemes and closed-loop recycling systems in escapist textile waste from landfills. Through case studies, successful models and strategies aligned with SDG 17.

1. INTRODUCTION

The textiles and apparel industry stands as a vital cornerstone of Bangladesh's economy, serving as a major contributor to export revenues and offering gainful employment to millions. However, this trajectory of growth has been accompanied by a concerning consequence: the escalation of material waste generation. This chapter serves as a foundational exploration into the extent of material waste within Bangladesh's textiles and apparel industry, aiming to analyze its multifaceted implications and devise strategies for effective waste mitigation and sustainable management. Globally, the textiles and apparel

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industry significantly influences trade flows, particularly in transitional economy countries where clothing comprises a substantial portion of total exports. Sri Lanka, for instance, has witnessed the integral role of the textile and apparel industry in its economic landscape, emerging as the largest net foreign exchange earner since 1992. With a robust upward development trend, the sector contributed six percent to Sri Lanka's GDP in 2020 and accounted for 40 percent of the country's total exports. However, this remarkable growth trajectory has been accompanied by a proportional increase in pre-consumer waste generation, leading to heightened concerns regarding environmental pollution.

Indeed, the textile and apparel industry's development has engendered environmental challenges, compounded by the inefficiencies in waste management. Sri Lanka grapples with various challenges in waste management, including deficiencies in recycling infrastructure and inadequate waste disposal mechanisms. Local authorities, in particular, have struggled to cope with the burgeoning problem of solid waste management, necessitating a concerted effort to develop robust and cost-effective waste management strategies.

The textile and apparel (T&A) sector, being pivotal for economic growth, especially in nations heavily reliant on it, poses significant environmental challenges. In Sri Lanka, the T & A industry's substantial contribution to the GDP and total exports underscores its economic significance. However, this sector's operations also entail negative environmental consequences, including resource depletion, greenhouse gas emissions, and environmental pollution. Notably, the sector is notorious for its high resource consumption and extensive chemical usage, particularly in dyeing and finishing processes, exacerbating pollution and waste generation issues throughout the manufacturing process. Efficient control and management of industrial waste are imperative for natural resource conservation, environmental protection, and safeguarding public health. However, inadequate waste management practices can lead to various problems for both humans and the environment. Therefore, comprehensive planning, research, and effective waste management strategies are essential to mitigate these challenges. In light of the scarcity of accurate information on waste generation and management practices within Sri Lanka's textile and apparel sector, this study aims to fill this gap by identifying waste generation patterns, characteristics, and management practices through a comprehensive case study approach. As the textile and apparel industry grapples with sustainability, product quality, efficiency, and regulatory compliance, there is a growing imperative for innovative solutions and eco-friendly practices. Embracing a circular economy approach and implementing advanced waste management techniques can enhance the industry's sustainability and resilience. By examining various sources of textile and apparel waste and exploring sustainable management solutions, this article seeks to promote a more sustainable and environmentally conscious approach to waste management in the textile and apparel industry (Fletcher et al., 2019).

The Indian textile and apparel industry, similarly one of the largest and oldest sectors, faces challenges related to waste management amid rapid economic and social transformations. As the industry continues to grow, the generation of textile and apparel waste escalates, necessitating effective waste prevention and management strategies. Designing appropriate waste management techniques plays a crucial role in minimizing waste production and disposal, aligning with global sustainability objectives.

2. WASTE GENERATION FROM TEXTILE AND APPAREL INDUSTRIES

The textile and apparel industries are significant contributors to global material waste generation, with production processes spanning from fiber production to garment manufacturing. In Bangladesh, Sri Lanka,