

A Three-Dimensional Assessment Approach on Sustainable Development Process of Sportswear Products

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Abstract : The life cycle assessment (LCA) is widely applied in the study of the sustainable fashion industry. Through the LCA, the social, environmental, and economic performances of the fashion industry can be assessed, which helps sustainable product developers (designers, retailers, and manufacturers) to address problems in product development. In prior studies, environmental impact, economic performance, and social responsibility are commonly considered separately. Inter-relations between dimensions of sustainability and LCA are rarely reported. The development process of sustainable sportswear products is complicated. Changes in the product components (e.g., materials, manufacturing methods, and product design) of sportswear will correspondingly influence supply chain activities and meanwhile affect environmental, economic, and social performances. In this study, the interrelations between different LCAs and how the interrelated LCAs can help product developers to strike a balance among environmental, economic, and social performances are explored. Based on the findings, a three-dimensional assessment framework on the sustainability life cycle is introduced. To examine the applicability of the developed framework, proof-of-concept sportswear leggings products were developed. The developed sportswear leggings products were assessed in terms of the interrelated dimensions of environmental, economic, and social performances. The results demonstrate the effects of shifting in design details and product functions on the environmental, social, and economic performances of sportswear products. The outcome of this study provides insights on the approach to balance sustainability and the development of cost-effective and sustainable sportswear products for sportswear developers.

Keywords : sustainable development, sports fashion, life cycle assessment, indicators for sustainability, sustainability impacts

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