# Chapter 13
# Bibliometric Analysis of Life Cycle Assessment and Sustainable Design Literature Using Vosviewer

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## ABSTRACT

*This study presents a comprehensive bibliometric analysis of the literature on Life Cycle Assessment (LCA) and sustainable design. As a result of a search of the Web of Science database, 655 articles were analysed and through these articles, the evolution, interaction and changes in the academic impact of the field were revealed. The increase in the number of publications and citations, especially since the 2010s, shows that the importance of this field in the academic world has increased. The fact that the majority of the articles are original researches shows that scientific activities in this field are carried out in depth. In addition, it has been determined that key concepts such as life cycle assessment and sustainable design are intensively included in the literature. The study also provides important findings on the most active authors, journals and articles in the field, emphasising the need for a multidisciplinary approach for future research.*

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## 1. INTRODUCTION

The fact that the world's resources are limited and rapidly depletable increases the awareness of sustainability in the building sector. In this context, designers, architects, landscape architects and material manufacturers aim to minimise the environmental impacts in the design, production, use, dismantling and demolition processes of buildings. Methods such as life cycle assessment (LCA), carbon footprint analysis and eco-labelling have been developed to determine these impacts. In particular, LCA stands out as a method that evaluates products and processes throughout their entire life cycles and reveals environmental impacts in a scientific and measurable way.

Approaches such as cleaner production, waste minimisation, industrial symbiosis, green engineering and design for environment (DfE) should be adopted to ensure environmental sustainability (Cüce, 2018). In this context, one of the most widely used methods, Life Cycle Assessment (LCA), is a comprehensive approach that assesses the environmental impacts of a product or process throughout its entire life cycle (Dassisti et al., 2016; Salihoğlu et al., 2019)

Life Cycle Assessment (LCA) is a comprehensive technique that assesses the environmental impacts of all stages in the life cycle of a product - raw material extraction, material processing, production, distribution, use, repair, maintenance, disposal and recycling. This method analyses a variety of environmental impacts such as depletion of abiotic resources, photochemical oxidant formation, global warming, acidification, eutrophication, ozone depletion and human toxicity. LCA addresses environmental impacts in a systematic and holistic approach at every stage from raw material extraction to disposal. Due to these features, it is widely preferred for environmental sustainability in sectors such as construction, food, tourism and raw material production (Asdrubali et al., 2013; Guo, 2012). The life cycle process is shown in Figure 1.