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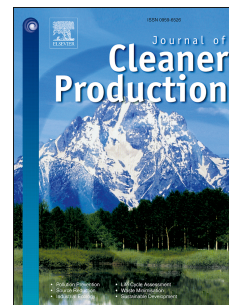
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Midpoint and Endpoint Impact Categories in Green Building Rating Systems

Walaa S.E. Ismaeel*

Lecturer at the British University in Egypt (BUE), Faculty of Engineering, Architectural Engineering Department, El Sherouk City - Cairo-Suez Desert Road, Postal No. 11837 - P.O. Box 43

*Corresponding author: Walaa.Salah@bue.edu.eg

Abstract

Green building rating systems (GBRSs) address a variety of areas of protection to solve current environmental problems. This is more relevant to decision making but not as scientifically reliable as following the midpoint and endpoint approaches. The purpose of this paper is to pinpoint the lack of a standard base for carrying environmental assessment and show the interrelations between eleven most widely used GBRSs in these terms through a descriptive statistical analysis. The study adopts a qualitative and quantitative methodology through credits' classification method, quantitative assessment and comparison on the level of midpoint and endpoint impact categories. The first step requires expanding the discussion to include different methods and levels of incorporating Life Cycle Assessment (LCA) to support credits' requirements. For other non-LCA based credits, a quantification index is used to express the contribution of each credit to the respective quantifiable inventory of midpoint impact categories. The analysis shows that the total weighted sum of midpoint and endpoint scores differ from one GBRS to another. Nevertheless, the correlation matrix indicates interrelations of some GBRSs which adopt similar approaches to address environmental problems. The study concludes that existing GBRSs although they have similar targets, they exhibit discrepancies in the base of their environmental assessment. This does not provide a robust base for comparing the outcome results and indicates the need for restructuring credits according to the midpoint and endpoint approaches. This investigation adds to the existing body of literature to demonstrate with evidence the need for using both approaches in a consistent framework for modelling environmental assessment. This allows optimum use of the benefits and overcomes existing gaps and limitations of both of them. This can assist GBRSs plan for future development in correspondence with national targets and international environmental initiatives.

Keywords; Environmental assessment; Green building rating systems; Life Cycle Assessment; Midpoint and endpoint impact categories

1. Introduction

Environmental building assessment should follow a universally accepted method for the benefit of the private and public sectors. This shall facilitate the use and application of environmental certification systems and integrates with national targets (Howard, 2005; Saunders, 2008). On one hand, using the Life Cycle Assessment (LCA) Approach suggests that this should start with defining the elementary flows, followed by a classification step into midpoint categories and assorted into endpoint categories, and this shall eventually yield reliable results (ISO, 2006). On the other hand, Green building rating systems (GBRSs) aim at providing a comprehensive account of buildings' impact according to a set of predefined areas of protection which is more relevant to the decision-making process (Doan et al., 2017; Miller et al., 2015). These two approaches represent a current debate for the outcome results as shown in Fig (1), and calls for the need of bridging the gaps between them.

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