Multi-Criteria Group Decision-Making Method for Optimal Selection of Sustainable Industrial Building Options Focused on Petrochemical Projects

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Abstract

Over the past three decades, sustainable development (SD) has gained wide recognition among decision makers and politicians. Today, this concept aims to provide a healthier environment, more-improved society, and developed economy in both developed and developing world communities. Thus, to achieve a sustainable community, one needs to first better understand the underlying indicators and adopt appropriate sustainable policies in different sections and sectors of the community. As a vital component, the construction industry plays a key role in SD, which has drawn the attention of decision makers to find sustainable solutions worldwide for such an active industry. Industrial buildings, as a large segment of the construction industry, consume vast amounts of energy and financial resources and have a major role in job creation and improving the quality of life in a society. Therefore, this paper focuses on social, economic, and environmental aspects of SD of industrial buildings to evaluate the sustainable indicators and to develop a combinatory multi-criteria group decision-making framework for optimal selection of sustainable options of industrial buildings. The developed framework considers uncertainty alongside various preference orders and risk attitudes of decision makers -using utility functions.
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