Evaluation of Life Cycle Assessment in Furniture Manufacturing by Analytical Hierarchy Process

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Abstract : Environmental issues in the furniture industry are of great importance due to the use of natural materials such as wood and chemical substances like adhesives and paints. These issues encompass environmental conservation and managing pollution and waste generated. Improper use of wood resources, along with the use of chemicals and their release, leads to the depletion of natural resources, damage to forests, and the emission of greenhouse gases. Therefore, identifying influential indicators in the life cycle assessment of classic furniture and proposing solutions to reduce environmental impacts becomes crucial. In this study, the life cycle of classic furniture was evaluated using a hierarchical analytical process from cradle to grave. The life cycle assessment was employed to assess the environmental impacts of the furniture industry, ranging from raw material extraction to waste disposal and recycling. The most significant indicators in the furniture industry's production chain were also identified. The results indicated that the wood quality indicator is the most essential factor in the life cycle of classic furniture. Furthermore, the relative contribution of each type of traditional furniture was proposed concerning impact categories in the life cycle assessment. The results showed that among the three proposed types, the design and production of furniture with prefabricated parts had the most negligible impact in categories such as global warming potential and ozone layer depletion compared to furniture design with solid wood and furniture design with recycled components. Among the three suggested types of furniture to reduce environmental impacts, producing furniture with solid wood or other woods was chosen as the most crucial solution.

Keywords : life cycle assessment, analytic hierarchy process, environmental issues, furniture
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