

Advantages of Integrating Circular Economy Concepts in Promoting Sustainable Construction

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Abstract

Greenhouse gas emissions, trash production, and resource use are all heavily influenced by the building sector. Ecosystem degradation and increased demand for natural resources are driven by the conventional linear "take-make-dispose" approach. As a result, incorporating Circular Economy (CE) principles provides a sustainable substitute that prioritizes material reduction, resource efficiency, reuse, recycling, and the extension of material lifecycles. With a particular focus on the environmental, economic, and social dimensions of the Sri Lankan construction industry, this study investigates the benefits of implementing CE principles for promoting sustainable construction. To get information on this integration, a questionnaire survey was given to professionals in the field, such as contractors, consultants, quantity surveyors, engineers, architects, project managers, and other stakeholders. A total of 111 valid responses were obtained from a total of 120 surveys. The Relative Importance Index (RII) was used to rank the benefits of adopting Circular Economy practices, which were found to have significant positive effects on the environment, the economy, and society. In terms of the environment, cutting greenhouse gas emissions associated with transportation, manufacturing, and material extraction had the highest RII value of 0.782. With an RII rating of 0.764, maximizing resource efficiency for cost reduction was ranked highest economically. The greatest social benefit was found to be the encouragement of fair access to resources and careful resource management. The results show that by reducing environmental effects, maximizing resources and economic efficiency, and promoting social sustainability, Circular Economy principles greatly improve sustainable construction. Raising awareness, working together, and putting these ideas into practice are crucial to helping Sri Lanka's construction sector shift to a more sustainable and resource-efficient model.

Keywords: *circular economy; construction industry; energy efficiency; material reuse; sustainability; waste minimization*