

Adopting a Circular Economy Model for Sustainable Construction and Demolition Waste Management

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Abstract:

Urban regeneration projects are complex processes that aim to achieve physical, environmental, social, and economic sustainability. However, current practices predominantly focus on physical renewal, neglecting the significant environmental impacts of construction, demolition, and household waste. This failure to integrate waste management processes results in low recycling rates, resource wastage, and increased pollution. A substantial portion of waste from urban transformation is inadequately recycled and sent to landfills, leading to economic losses and environmental damage. This issue is exacerbated by finite landfill capacity, resource depletion, and carbon emissions. The prevailing linear supply chain model (“buy, make, throw”) hinders sustainable outcomes. This research examines the implementation of a circular economy model to manage urban transformation waste effectively. It aims to analyze current waste management practices to identify gaps, establish a framework for integrating circular principles, and explore innovative methods and technologies to enhance waste recovery. The economic benefits, environmental impacts, and social acceptability of these applications are also assessed. The study concludes that a shift to a circular model is not only feasible but essential, offering a strategic framework to minimize waste, maximize resource efficiency, and create a more sustainable and economically viable urban regeneration process.

Keywords:

Urban regeneration, circular economy, construction and demolition waste, sustainable waste management, resource efficiency.