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Informing Building Concept Design with Circular Economy Principles: State-of-the-Art

Maria Beatrice Andreucci*[1], Marianna Marchesi[2], Marco Delli Paoli[1], Selin Karagözler[3]

[1] Sapienza University of Rome, Department of Planning, Design, Technology of Architecture, Via Flaminia, 72, 00196, Rome, Italy
[2] Cardiff University, Welsh School of Architecture, Bute Building King Edward VII Avenue, Cardiff CF10 3NB, United Kingdom
[3] Yaşar University, Faculty of Architecture, Department of Interior Architecture and Environmental Design, 35100, İzmir, Turkey

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ABSTRACT

SDG 12 Responsible Consumption and Production calls for the adoption of sustainable production and consumption patterns as a critical pathway to sustain the livelihood of current and future generations. If the design, building and construction industry is determined to contribute to the achievement of this important goal, practitioners and decision-makers need to change the current approach to building design, based on the linear take-make-dispose model, shifting design thinking and practice in favour of the circular economy (CE).
A circular building is conceived, designed, developed, used, and reused without unnecessary resource depletion, environmental pollution, and ecosystem degradation. It is constructed in an economically responsible way and contributes to the long-lasting well-being of people and the biosphere.
An effective transition to a sustainable built environment implies informing design thinking and supporting decision-making with CE principles from the early stage, as the most impactful phase of the whole design process, vis-à-vis desired functionality, performance, cost, time, aesthetics, and overall sustainability outcomes.
Despite promising advancements characterising the contemporary sustainable design scenario, evidence shows that practitioners still lack integrated frameworks and tools supporting circularity, especially in early-stage decision-making and concept design.
The proposed contribution will illustrate the state-of-the-art of approaches, frameworks, methods and tools supporting circular building design, focusing on the early stage of the process. The authors, targeting a variety of audiences including but not limited to researchers and practitioners, will present the results of a systematic review on the subject, currently being finalised. The goal is to highlight latest advancements for circularity informed decision-making as well as barriers and research gaps in order to facilitate effective design processes, and ultimately mainstream CE strategies and solutions at the building scale.

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* Corresponding author: mbeatrice.andreucci@uniroma1.it