

Special Issue

Research on Bio-Alternative Building Materials in Sustainable Construction

Message from the Guest Editors

The construction industry consumes vast natural resources and emits significant greenhouse gases. As pressure grows to decarbonize the built environment, bio-alternative materials from agricultural by-products, plant biomass, and renewable sources offer a promising path to sustainable construction. These materials reduce carbon footprints, support circular economy principles, and provide local alternatives to energy-intensive conventional materials like cement and synthetic insulation. This Special Issue invites original research and reviews advancing knowledge of bio-alternative building materials for sustainable construction. Topics include mechanical, physical, thermal, social, and durability performance of bio-based materials; agricultural waste valorization; biomass-derived supplementary cementitious materials; bio-composite boards and insulation systems; and integration into low-carbon building design. Contributions on material characterization, standardization, policy, perception, supply chain, lifecycle assessment, and real-world applications—especially in tropical and developing regions—are strongly encouraged. We look forward to your contributions.

Guest Editors

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About the Journal

Message from the Editor-in-Chief

Current urban environments are home to multi-modal transit systems, extensive energy grids, a building stock, and integrated services. Sprawling neighborhoods are composed of buildings that accommodate living and working quarters. However, it is expected that the cities and communities of the future will face complex and enormous challenges, including maintenance, interconnectivity, resilience, energy efficiency, and sustainability issues, to name but a few. A smart city uses advanced technologies and a digital infrastructure to improve the outcomes in every aspect of a city's operations. A smart building optimizes the experience of occupants, staff, and management by using a modern and connected environment. Innovations in technology that can bring dramatic improvements to design, planning, and policy are critical in developing the cities and buildings of the future.

Editor-in-Chief

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