Chapter 1

A Study on Emerging Trends in Mitigating Unsustainable Practices in the Construction Process: Innovations, Regulations, and Strategic Pathways

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ABSTRACT

This chapter explores emerging trends for addressing unsustainable practices in the construction process through the use of modern approaches to technology, regulations, and management. It offers an assessment of how digital technology, development and promotion of sustainable materials, and emphasis on the circular economy of industry practices limits (or seeks to mitigate) environmental and socio-economic impacts of the built environment. The role of regulations, government policies, international sustainability standards, and the capacity of all construction stakeholders to adopt sustainable practices are critically assessed. After identifying pathways toward action and key constraints to sustainable change, this research provides direction on how the construction sector address the opportunities and challenges of global sustainability in association with "smart" development and industry projects characterized by resilient practices that are more efficient and ecologically sound.

INTRODUCTION

The construction sector is a widely accepted economic powerhouse driving economic development, infrastructure development, resource users and waste producers. The construction industry is not only a key driver of economic development, but it is also resource-intensive and has a significant environmental impact. Globally, the construction industry accounts for a significant share of total energy consumption, natural resource use, greenhouse gas emissions and waste production. The United Nations Environment Program states that the construction and building sector accounts for approximately 37% of global CO_2 emissions (El-Hakim & AbouZeid, 2024). Technology and advocacy policies cannot seem to overcome the unsustainable practices in terms of inefficiencies in material use, energy use, poor waste disposal practices, and harm to the ecology present in the various phases in the construction life cycle. As the call for sustainable development grows louder in the context of climate change, resource depletion and social inequality, the trends that are advocating for a more sustainable building process must be examined.

The idea of sustainability in construction is not new, however, the ways in which it is addressed have changed dramatically in recent years. Responsiveness to unsustainability may look like: compliance with rules and regulations, environmental assessment; these types of responses are no longer enough on their own in isolation. The sector is progressing into more systemic and proactive strategies like lifecycle thinking, digitalization, decarbonization and circularity. The recently emerging trends where unsustainable practice is being mitigated, demonstrate this