Chapter 15
Utilization of Biodegradable Sustainable Materials in Modern Construction Processes

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ABSTRACT

This chapter explores how modern construction uses biodegradable sustainable materials to cut carbon footprints and boost sustainability. It looks at the hurdles and progress in using these materials. Biodegradable materials are causing a revolution in building methods boosting energy savings, and cutting waste even with issues like scaling up and following rules. The chapter talks about successful uses in homes, businesses, and public buildings around the world. These materials help the environment by cutting greenhouse gases using less energy, being easier to recycle, and making indoor air cleaner, all of which support green building. The chapter shows how scientists, makers, architects, and rule-makers work together to speed up the use of biodegradable sustainable materials in building and to protect the environment.

INTRODUCTION

In order to lessen its influence on the environment, the construction sector is realizing the importance of sustainable methods. This chapter examines the varieties, advantages, difficulties, and consequences of biodegradable materials for sustainable development in contemporary building. It presents a viable route for cutting carbon footprints and encouraging environmental care. When compared to conventional building materials like concrete and steel, biodegradable materials—such as natural fibers derived from renewable resources, and bio-based composites—offer a reduced environmental effect. Their construction is guaranteed to be sustainable due to their utilization of renewable resources, which is in line with the circular economy's goals of minimizing waste and optimizing resource efficiency (Orhon & Altin, 2020).

Construction is using more and more biodegradable materials, such as bamboo and bioplastics, since they can lower greenhouse gas emissions both during manufacturing and use. Bamboo is a substance that absorbs carbon dioxide and grows quickly, making it carbon-negative. The carbon footprint of production is decreased by using bioplastics made from plants rather than petroleum-based substitutes, which release less greenhouse gases. Because they take less energy to produce than traditional materials like steel or aluminum, biodegradable materials provide energy efficiency and lower total energy consumption in the building industry. This increases the viability of using these materials on a broader scale from an economic standpoint as well as supporting sustainability aims (Maraveas, 2020).

Unlike conventional building materials, biodegradable materials have inherent qualities that promote healthier interior environments. Since they don't release any toxic compounds over time, this is becoming more and more appreciated in con-