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COMMODITIES AT A GLANCE Special issue on bamboo

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COMMODITIES AT A GLANCE Special issue on bamboo

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NOTE

The term "tons" refers to metric tons.

Unless otherwise stated, all prices in this report are in nominal terms.

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CHAPTER I

Introduction

This report discusses the general uses of bamboo and explores its potential as a modern building material. It also highlights the benefits developing countries could derive from developing bamboo sector through its use in downstream industries.

Bamboo is a woody perennial evergreen plant in the grass family (Poaceae). Many of the large species look like trees with culms that can reach up to 30 metres in height and 30 centimetres in diameter.¹ For centuries, in Asia, South America and Africa, bamboo has been an integral part of the lives of inhabitants who live close to bamboo forests for food, cottage industries and construction. The use of bamboo has expanded over the last few decades, with applications in industries such as textiles, paper and modern construction, spurred in part by substitution effects of wood-based materials and efforts to reduce greenhouse gas emissions. This has contributed to increased trade in bamboo-based products and has underscored the economic importance of establishing downstream industries with growth potential, one of which is construction. More information is needed on the properties of bamboo and the innovative products manufactured from culms that provide viable options for substituting traditional building materials in order to drive this growth.

A major component of this report is a comparative analysis of the physical and mechanical properties of bamboo relative to traditional building materials. The construction industry uses man-made building materials such as cement, concrete, steel, bricks and concrete blocks, as well as a wide range of natural building materials such as timber, bamboo and clay. Selecting the material to use for a specific application depends on several factors, including strength (ability to withstand different external loadings), availability, durability, affordability, cost-effectiveness and aesthetics.

Timber, steel and concrete are the conventional building materials used in construction, largely because their mechanical properties are known and their codes of practice for designing and building are available to assist and guide engineers and architects. However, using these materials increasingly presents challenges in terms of sustainability. The manufacture of steel and concrete requires energy-intensive processes in extraction, leading to high greenhouse gas emissions. According to the International Energy Agency (IEA), the iron and steel sector is the largest emitter of carbon dioxide emissions among heavy industries, accounting directly for 2.6 gigatons of carbon dioxide annually (IEA 2020). The cement industry is the third-largest industrial energy consumer and the second-largest industrial emitter of carbon dioxide (CO2) worldwide. It has also been estimated that production of one ton of CO2 emissions (UNCC 2017), and that the production of one ton of steel releases about 1.85 tons of CO2 into the atmosphere (Hoffman et al. 2020). Hence steel and cement contribute to making the construction industry one of the worst emitters of greenhouse gases. Timber production also raises environmental concerns

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