

Preface

Humans for many centuries have harnessed the multifaceted applications of bamboo, including those in the structural and engineering fields and for food and medicinal purposes mainly in Asia and Africa. However, the practical applications for bamboo in the areas of composite materials, textiles, and structural engineering have seen tremendous growth and research interest over the past decade.

The existing literature on bamboo often assumes a very narrow dimension. The literature on bamboo can be grouped into four main categories. These include biological, architectural, structural engineering, and the socio-economical contexts. Farrelly (1984), in “The Book of Bamboo: A comprehensive guide to this remarkable plant, its uses, and its history”, focused on the biological components such as taxonomy, anatomy, and cultivation and harvesting. However, Janssen (2000) mainly dealt with the fundamental dimension of bamboo.

Bamboo is a multifunctional plant, and this book is structured to present a holistic perspective on bamboo by tackling all its relevant facets. It is however written from the perspective of the engineer. Bamboo used as a potential alternative to fossil fuels, forest firewood, and charcoal in the African context is discussed. This book will further present a thorough review of the research and literature, the current experimental characterisation techniques, and the role of finite element analysis in improving the properties of bamboo products. A comprehensive assessment of bamboo as an engineering and known engineering material is made. This book is intended for use by specialists, experts, and multidisciplinary research and development researchers working in fields related to bamboo. It would serve as a multidisciplinary research manual on bamboo taxonomy, properties, and, in particular, on bamboo characterisations and its industrial applications. More specifically, the authors’ unique contributions to this book are in bamboo characterisation and the identification of different applications of bamboo as a sustainable engineering material, which has not previously been fully investigated and reported.

To the best of the authors’ knowledge, no such book exists that presents a total view and also an African perspective on the subject. The African literature is critical because bamboo will assume a much greater role as the world gravitates towards sustainable resource utilisation. This book has been long overdue and would appeal

to a wide demography due to its in-depth and broad spectrum while bridging the multidisciplinary divide to provide a holistic resource on the subject.

We would furthermore like to acknowledge the support of technical reviewers, as well as language and graphical editors, who have all contributed to this process. We value the system of scholarly peer-review and the approach that the same adds to producing a research text that adds to the body of scientific knowledge.

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Esther Titilayo Akinlabi
Kwame Anane-Fenin
Damenortey Richard Akwada

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Bamboo

The Multipurpose Plant

Akinlabi, E.T.; Anane-Fenin, K.; Akwada, D.R.

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