Sugarcane Fiber-Reinforced Bricks as a Sustainable Construction Material

Christian Bock-Hyeng
North Carolina Agricultural & Technical State University
cbhyeng@ncat.edu

Andrea N. Ofori-Boadu
North Carolina Agricultural & Technical State University
andreao@ncat.edu

Emmanuel Yamb-Bell
The University of Bamenda
yamb_bell@yahoo.fr

Musibau Shofoluwe
North Carolina Agricultural & Technical State University
musibaus@ncat.edu

Abstract

Housing crisis is a crucial issue as one billion people are either homeless or live in very poor housing, particularly due to high costs associated with conventional building materials such as steel and concrete. There is an urgent need to develop and promote cheaper building materials with minimal impact on the environment. A return to natural and earthen construction materials seems to be one of the most sustainable options for building materials. Adobe brick or sun-dried brick construction presents good insulation, fire resistance, and energy saving properties. However these bricks are not without defects. In spite of all the many advantages, adobe bricks have low physical and mechanical properties. There is a critical need for studies to improve the properties of adobe bricks.

The main purpose of this research study was to improve the performance of earth bricks by stabilizing these bricks with sugarcane fiber waste. Laboratory experiments were conducted using sugarcane fiber waste stabilized adobe brick specimens with fiber proportions of 0%, 0.3%, 0.6%, 1.2%, 2% and 3% by weight. The results are promising and support the hypothesis that sugarcane fiber wastes can be used to improve the mechanical properties of earth bricks. The use of abandoned sugarcane fiber waste in adobe bricks will contribute to the development of stronger and more durable adobe brick structures, while reducing the environmental and economic challenges associated with the disposal of sugarcane waste.

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Biographies

CHRISTIAN BOCK-HYENG is currently an assistant professor with the Department of Built Environment at North Carolina Agricultural and Technical State University. His area of expertise are in Strength of Materials, Thin Shells Construction, Bridge Construction and Transportation. Dr. Bock-Hyeng may be reached at cbhyeng@ncat.edu

ANDREA N. OFORI-BOADU is currently an assistant professor with the Department of Built Environment at North Carolina Agricultural and Technical State University. Her area of expertise are in Sustainable Construction, Cost Engineering and Quality Management. Dr. Ofori-Boadu may be reached at andreao@ncat.edu

EMMANUEL YAMB-BELL is currently a professor with the Department of Civil Engineering and Forestry Techniques at the University of Bamenda, Cameroun. His areas of expertise are in Strength of Materials and Thin-Shells Construction. Dr. Yamb-Bell may be reached at yamb_bell@yahoo.fr

MUSIBAU SHOFOLUWE is currently a professor with the Department of Built Environment at North Carolina Agricultural and Technical State University. His area of expertise are in Sustainable Construction, Quality Management, Safety and Housing. Dr. Shofoluwe may be reached at musibaus@ncat.edu