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## **Identification of factors on the possibility of bamboo as scaffolding and a formwork material in Ethiopia**

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In several countries trend bamboo has been used as a scaffolding material in building projects. Nonetheless, Ethiopia is known for the high population of bamboo vegetation such utilization of the material remained untapped. The purpose of this paper is to identify factors that influence bamboo's structural suitability as a temporary material and to create a conceptual map for using it as an alternative structural material. Following the identification of important applications influencing parameters via literature analysis, both qualitative and quantitative approaches were used to identify significant factors. The paper also used a series of protocols; at first, several documents were selected based on criteria to provide an overview of bamboo-based construction systems. Following that, four major categories for SWOT analysis were chosen to examine the Ethiopian construction industry's stance on the use of bamboo as a scaffolding material. Finally, a scoring model was employed as a quantitative analysis protocol to calculate the weight of factors (safety, procedure and implementation, time, and cost) through expert opinions. The investigation revealed that the use of bamboo has a cost and time savings advantage, while an increase in trash in acute and intermittent areas was one of the challenges. Furthermore, one of the challenges in creating bamboo formwork is a lack of complementary joinery techniques. Besides that, it is expected that the bamboo content will fall short of technical requirements. On the Brightside, every single respondent stated unequivocally that bamboo-made formwork meets a

low-cost requirement.

### **Recent publications**

1. Leule M. Hailemariam, Ermias A. Amede, Ezra K. Hailemariam & Denamo A. Nuramo (2022) Philosophies of bamboo structural design and key parameters for developing the philosophies, *Cogent Engineering*, 9:1, 2122155,
2. Ermias Amede (2022) A relationship between productivity and significant controlling factors of highway construction earthwork, *Cogent Engineering*, 9:1, 2114203,
3. Hailemariam, E.K., Hailemariam, L.M., Amede, E.A. and Nuramo, D.A. (2022), "Identification of barriers, benefits and opportunities of using bamboo materials for structural purposes", *Engineering, Construction and Architectural Management*, Vol. ahead-of-print No. ahead-of-print.

### **Biography**

Ermias A. Amede is currently working as a lecturer in the Ethiopian Institute of Architecture, building construction and city development, Addis Ababa and Ethiopian Defense Engineering College. He received his MSc degree in Construction Management from EiABC (Ethiopian Institute of Architecture, Building construction and City development), AAU (Addis Ababa University), Addis Ababa, Ethiopia and a BSc degree in Construction Technology and Management from the same university. His research interest includes project management, prediction modeling, sustainable construction, cost-efficient construction systems, and materials.

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