

Ezema, I. C., **Opoko, A. P.** and Alagbe, O. A. (2016).

Mitigating the environmental impact of residential buildings through the use of alternative building materials: A review.

Architects' Colloquium Held April 25 - 28, 2016 2016

At Shehu Musa Yar'adua Centre Abuja.

Abstract

Buildings in general and residential buildings in particular impact on the environment through the energy and carbon embodied in the production and use of building materials. A number of studies have identified portland cement, portland cement cement-based products and steel reinforcement as major contributors to the embodied impact of residential buildings. Incidentally, these high impact materials constitute the bulk of the materials used in urban residential building construction in Nigeria. Also, there is considerable literature on alternative building materials which can be used to substitute high impact materials in Nigeria. Using the literature review approach, this paper examines the alternative materials that can be used to substitute the prevalent high impact materials with a view to making the buildings more sustainable by reducing their embodied energy. Relevant journal articles published between 2000 and 2015 and sourced from several databases were selected and studied. The materials were examined under the following headings: cement substitutes, mortar substitutes, concrete substitutes, steel reinforcement substitutes and substitutes for external and internal walls. The study found that in as much as substitutes exist for some high impact materials, there is the need to undertake further research especially for the purpose of codifying the materials for unhindered use in the building construction industry. In addition, adequate research-industry partnership is necessary for speedy adaptation, dissemination and use of research findings on alternative building materials.

Keywords: building materials, environmental impact, material substitution, Nigeria, residential buildings