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Examining the Practice of Using Bamboo for Construction, Indoor and Outdoor Decoration

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ABSTRACT

With the rise in the cost of building materials all over the world, there is a need to resort to low-cost building materials or building materials that are not capital-intensive. One of such low-cost building material that suits the purpose of the study is bamboo. This paper attempted to present the use of bamboo in the building industry. The paper made use of the survey method in data gathering and discussion. It was found out that bamboos are formidable in building and interiors, as the innovation has been globally accepted to be quite reliable as a housing decoration tool, especially in developing countries of the world. The study recommended that bamboo should be harnessed as a cost-effective material besides being a preferred option that has gained wide acceptance for both indoor and outdoor decorations.

Key Words: Cost-effective, Bamboo, indoor decoration, outdoor decorations, bamboo varieties, use of bamboo.

INTRODUCTION

Bamboo (Bambusa) is a genus of between 1000 to 1,400 species of clump-forming evergreen bamboos that occur in forests and woodland in tropical and sub-tropical Africa, Asia, Central and South America (Auwulu and Dickson, 2019; Montaigne, 2017). Bamboos are woody members of the grass family that vary in height from a few centimeters to 40 meters (Sakaray et al., 2012). Bamboos are of the family of Poaceae which is further divided into sub-families, tribes, sub-tribes, and then genera. The sub-family *Bambusoideae* represents the woody and herbaceous bamboo.

Bamboo often grows in dense, impenetrable clumps in the tropics while some, such as Arundinaria alpine grow on mountain sides and can withstand cold conditions (Salzer et al., 2016; Paglione, 2003). Because of their abundance, strength and unusual stem structure (woody and hollow with solid, stiffening cross joints) bamboo are used for many purposes, including the building of houses, making furniture, indoor and outdoor decorations. According to Steiner (2020); RMRDC (2014), it takes about a year for a bamboo stalk to grow to maturity and then from one to six years for it to become useful as a building material.

Theoretically, all bamboo materials are renewable (Christopher, 2023), however unlike trees that are renewed within human time span and harvested only once, bamboo regenerated like grass after it.

The paper aims at identifying the various uses of bamboo. The objectives include, identifying the variety of bamboo for construction purposes; indoor and outdoor use of bamboo, and the importance of bamboo in the building industry, these are considered the study variables the paper tends to unravel.

This paper although limited to critical analysis of research documentation on Bamboo, is generic in nature, i.e. without focus on a particular region or country, as it can be applied to any region of the world to obtain amazing outcomes. The paper is considered significant in view of the high cost of building and construction materials in the tools and building material markets.

The study is further limited to residential buildings in terms of pre-construction and post-construction stages. Its usefulness notwithstanding, the common inherent limitation is that bamboos are prone to insect and fungi attacks, and shrinks faster than timers.

The usefulness of this study is expressed now that bamboo are particularly needed to assuage the effects of the rising cost of building materials like steel, rods, nails and binding wires, which keep skyrocketing disproportionately.

MATERIALS AND METHODS

The study adopted a survey research method for data analysis. Materials were sourced from primary and secondary sources, although secondary sources were

fundamental. The study as well made use of both quantitative and qualitative research design approaches. Quantitative in the sense that site appraisals were made before conducting a massive literature review, which is considered qualitative in nature. This implies tests or reviews of bamboo samples and visits to sites/locations where bamboo are used in building constructions.
The simple technique in the use of bamboo is in selecting the suitable specie from the wide range or class of bamboo available. Some are good as load bearing, sturdy, eco-friendly, naturally resistant to water and are therefore suitable for building construction while others are preferred for styling and decoration because of their color and size/ easy to clean, resistant to tear and wear (Johnston and Nary, 2020).

SUITABILITY OF BAMBOO AS BUILDING A MATERIAL

The suitability of bamboo finds expression in its being a sustainable material for construction, and most environmentally friendly, affordable, flexible in usage and durable (Auwalu and Dickson, 2019).
Bamboo possesses all these characteristics, thus making it one of the suitable building materials. Bamboo is a renewable and lightweight material with high tensile strength. The durability and lifespan of bamboo can be further enhanced with the use of chemical and non-chemical preservatives to prevent it from insects and fungi attacks.
However, any preservative technique adopted should be done in its green or wet state because of the impermeability of its outer and inner membrane to liquid when dry.
In addition, bamboo emerges as one of the sustainable materials for building construction since it grows rapidly, is easily adaptable to most climatic conditions and easy to assemble.
Bamboo has impressive pre-fabrication qualities, lightweight, easier to be transported to the site, possesses no health hazards, is very cost-effective and easy to use.
The findings of the study will facilitate the use of local materials and reduce the quest for expanded metals, rods and other foreign building materials commonly used, vastly, in the building industry in many developing nations of the world. These are considered very exorbitant and out of reach of the common man, thus deterring him from possible ownership of a house especially in his father's abode as tradition demands.

RESULTS AND DISCUSSION

Varieties of Bamboo for Construction

Most botanists recognize more than 1200 species of bamboo or as many as 2000 cultivars (Madan et al., 2018). Obviously, each variety of bamboo is special and amazing in its own form, but only a handful are ideal for building construction.
From thousands of these available varieties of bamboo to choose from, the perfect species for any occasion can be truly found. Despite buildings, bamboo can be put to other uses like the making of fishing poles beautiful accents for gardens, hedges, excellent bamboo for eating and plenty of other available varieties that have multiple uses.
The best bamboo building typically belongs to one of these four genera. *Guadua, Dendrocalamus, Bambusa, and Phyllostachys* (Chung et al., 2022). Some of these bamboos grow over 30 meters tall and up to 200-300mm in diameter (Andrea, 2015). However, these species are very uncommon because they are based on ideal growing conditions. To order and shipping these species could be pretty expensive if not locally. But those bamboo species of between 9m – 12m tall and 75-100mm diameter can be sourced locally and of course, are less expensive. Other features to be considered are the hollow in the centre and the best variety for building should be those bamboos with the thickest of walls. But some types of Bamboo like Dendrocalamus strictus and most species of chusquea are actually solid. These could also be desirable for building depending on how it is put to use. However, they are generally, an excellent source of bamboo lumber.

Bamboo for Decorative Purposes

In the selection of bamboo for decorative purposes, the colour of bamboo is considered paramount and of utmost importance, in addition to the skill required to project a careful display of a wide variety of Bamboo specie.
Bamboo from the species of Phyllostachys *Nigra* is very dark, almost black and looks beautiful when dried. It looks good for decorative accents but does not possess ideal properties for building purposes. It is good to know that most bamboo as dark green when it grows but turns yellow once it dries like the species found locally in South East Nigeria. Practical and durable bamboo is resistant to shrinking and swelling. Because it can withstand extreme changes and humidity and temperature bamboo is a great choice for bathroom and kitchen decoration.

Bamboo as Eco-Friendly Material

Bamboo being eco-friendly does not contribute negatively to environmental disorder, but, rather promoted harmony by being user-friendly. The largest plant in the grass family possesses strong properties, 100% bio-degradable, is easily regenerated and is an eco-friendly material making it a highly preferred option by designers. Being a lightweight material when dried is resistant to both tear and wear makes it acceptable for indoor and outdoor decoration (ABS, 2022). Bamboo is naturally resistant to moisture and is one of the very cost-effective construction materials.
Bamboo products remain eco-friendly as long as they have not been chemically processed meaning that they have not been dab or impregnated with harmful chemicals. Bamboo in its natural state provides formidable resistance to natural hazards, and hence resists corrodibility to external aggression, hence

Figure 1: Use of Bamboo for bedroom beautification.

Figure 2: Use of Bamboo for wall textures.

suitable for human health and relaxation. Their strength can however be reduced when exposed to chemicals meant for preservation.

Importance of Interior Decoration

Interior decoration helps to uplift the spirits of an occupant, effectively optimizes the interior space and puts the available space in our home to best use. Interior decoration plays a very life-changing role in our residents by improving their lifestyle, making it modern and stylish. Because bamboo is strong, resistant to damage inviting and comforting, bamboo becomes the best option for designers whose mission is to offer sturdy, affordable, impressive and quality textured interiors.

Bamboo for Indoor Decoration

The following are the indoor use of bamboo.

Bamboo for Bedroom Decorations

Bamboo can be chosen and used in bedrooms where elegance and cool look are required. The bamboo styling shown in Figure 1 satisfies this desire and presents a sturdy and affordable home.

Bamboo for Wall Texture Design

To create an affordable and impressive textured wall design in the living room, bamboo of the same size can be used by cutting them into the same length, polish them properly with linseed oil, raffia woven ropes at both ends and glued together across in square, triangle or square shape as desire (Figure 2).

Bamboo can be used from floor to ceiling as a unique divider between two rooms. For a moisture-resistant and low-maintenance panel bamboo cane could be embedded in a protective resin.

Eco-Friendly Blinds

With the use of strong bamboo logs, the necessary privacy for building terraces or windows could be achieved with a delicate appearance. Bamboo is maintenance-free, easy to clear and available in various styles.

Figure 3: Bamboo for wall art and journal holding.

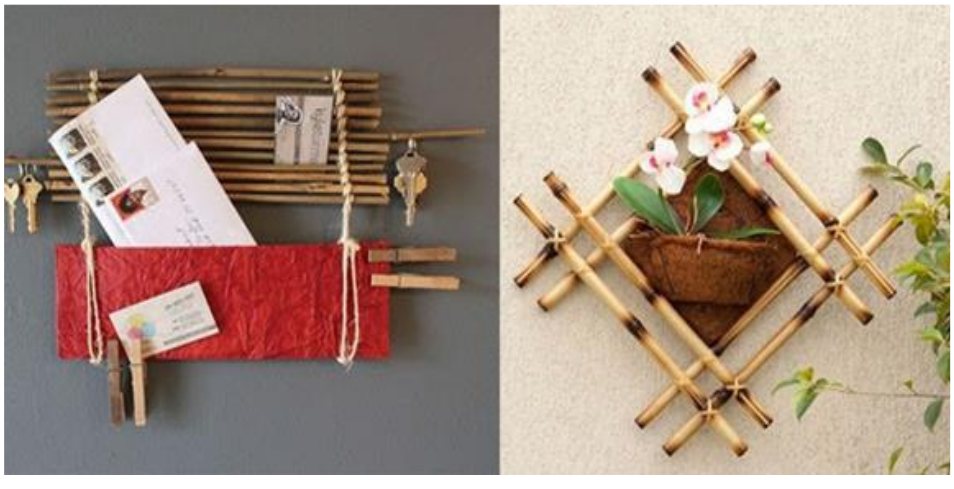

Figure 4: Bamboo for letter holding and wall decorations.

Bamboo Wall Arts and Journal Holders

Indoors aesthetic value will be incomplete without the use of bamboo frames complimenting colours and fabric to add value to wall surfaces (Figure 3).
Amazing bamboo well pieces and journal/magazine holders can be created by cutting the same size of bamboo into the same length and arranging them with woven ropes made out of raffia materials as shown in Figure 4.

Bar Decoration With Bamboo

Another unique way of decorating the interior is the use of bamboo material to add creativity to personal bars (Figure 5).

Kids' Exciting Double Bunk Bed

Strong and affordable double bunk that could withstand the excises of children can be crafted from Bamboo. This will be pleasing to twins and siblings of almost the same age grade (Figure 6).

Creative Bamboo Dinning Seat And Centre Table

Dining is the most important part of a house and requires aesthetically pleasing furniture pieces to complete relaxation (Figure 7).

Bamboo Sofa

Bamboo sofa sets can be used to add natural elements to the decoration of the living room, ante-rooms or porch (Figure 8).
The aptness of using bamboo for sofa is the suitability in not playing host to rodents and reptiles. In addition to its aesthetics (combination of various bamboo species during the construction phase of project developments) and durability.
It is very useful in human comfort, especially in seating

Figure 5: Bamboo for Bar decoration.

Figure 6: Bamboo for Bed Rest Profiling.

Figure 7: Bamboo for dining set.

position and can provide a level ground for a smooth flow of discussion and cross-fertilization of ideas.

BAMBOO FOR OUTDOOR DECORATION

Woven Bamboo Fence

Fence are the most common among numerous ways to use bamboo for outdoor decoration. Bamboo fence panels are lightweight, making them easy to manipulate. One method as shown in Figure 9a is to start by drilling holes at the top and bottom of two vertical support bamboo pieces. Run two other horizontal lengths of medium-width of bamboo between them (at the top and bottom of the vertical bamboo) by inserting them into the holes and securing them with super glue to form a

Figure 8: Bamboos for seaters and sofas.

Figure 9a: Bamboo for perimeter fence work.

Figure 9b. Bamboo for barricading entrances from public domain.

rectangular or both square frame. Drill holes at 150mm intervals on horizontal supports. Cut bamboo of the same size into liners of adequate lengths and insert them to fill the holes of the horizontal bamboo support at the top and bottom. Lace them together with twins where they are interested. To strengthen and fix the rigid into positions liners are run horizontally and at reasonable intervals.

Another method is shown in Figure 9b where bamboo is cut into desired fence heights and fastened with raffia rope or any available locally sourced ropes to maintain the natural value.

Creative Garden Seats

The best place to relax with a touch of nature is the garden Bamboo sets in a garden displaying a reasonable feeling of artistic and creative expression.

The narrow bamboo relaxation seat (Figure 10) is a fun useful accent, socially discreet, unique and suitable for

Figure 10. Garden Bamboo.

Figure 11: Garden Illumination using Broad Bamboo.

any garden space. It adds aesthetics to garden scene, as well as having added value to the overall recreational environment. Its composition makes it apt for the maintenance of body temperature while having a cooling effect on the human body system. Garden bamboo can be blended with flower gardens to produce a healthy and acceptable relaxation for man's growth and well-being.

LIGHTING UP GARDEN WITH BAMBOO FENCE

This is a unique idea to craft lights inside the bamboo. Lighting may be used for illumination (Figure 11), decoration and to indicate direction according to the positions in which the source of light is placed. Three main factors should be taken into account when considering the provision of outdoor lighting. These are; the purpose it is intended to serve, the quality of installation required and the local character and aesthetic requirements.
Figure 11 shows the arrangement of lighting points into broad bamboo in a fence to add style and an aesthetically pleasing night environment. In addition to lighting the night environment, it can be useful in stimulating night-life activities as recreationists find psychological pleasure in recreating around the lighted scenes.

BAMBOO FOR STAIR CONSTRUCTION

An interior design with a bamboo staircase gives the room an elegant, cozy, impressive and warm interior.
Figure 12 justifies this bamboo staircase decoration idea which presents an affordable cool interior.

BAMBOO ACCESSORIES

A creative and functional piece of bamboo spacers can be crafted to serve as mobile phone holders and also serve as speakers to enhance the sound quality of cell phones; Figure 13 explains the use and method of placement.
Other accessories that could be crafted out of bamboo include pen holders for office table tops, paper holders, notice boards, and picture frames.

BAMBOO RUGS

Although Bamboo rugs are not completely fireproof they are more resistant to fire than most materials because of their natural oils and structure making them a great choice. Bamboo fibers according to Christopher (2023) are durable and come in a wide variety of patterns, colours and sizes. Bamboo rugs are woven using strips

Figure 12: Bamboo Staircase Decoration.

Figure 13: Bamboo Speakers.

of bamboo bound with cotton, jute or other materials. They are cool, comfortable and soft as well.

According to Mitchell (2021), the many varieties of bamboo rug include dried bamboo floor soft mat, Pillowtex, Bamboo mat, oriental furniture bamboo rug, bamboomn6x green, bamboo rolling mat set, making and Bath mat for luxury Shower (nonslip).

Bath Mat for luxury shower-non-slip bamboo is a sturdy waterproof bathroom carpet for indoor or outdoor use.

CONCLUSION

Bamboo can be used to achieve a wide variety of construction and decoration ideas. Bamboo is quite good to give a twist to modern furnishings in homes when attractive interiors are needed.

Most of all, bamboo is a cost-effective material making it a preferred option and acceptable for indoor and outdoor decoration.

The limitations to the use of bamboo, however, can be overcome by treating bamboo organically or inorganically against insects and fungus, before usage.

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