Abstract

Building accounts for 40% of the world's emissions from CO_2 and oil. In addition to thermal insulation and demand for electricity, building stability and energy efficiency are generally assessed based on critical criteria, CO_2 reductions, and environmental features of the materials used. Therefore, it is essential to maximize the use of ecological materials to make buildings as sustainable as possible. This work studied Bamboo and sheep wool's potential to be used as helpful material in other industries other than its traditional use. The purpose of this study is to explore the possibility of substitute renewable, natural materials with better ecological and highest energy values for modern building consuming resources with commonly used energy.

Introduction

Sustainability is among the most commonly used words; however, less understood. The core importance is most often distorted by different definitions, which are worsened by a propensity to deal with the topic by smart, “environment vaguely,” or “green” terminological expressions. Nevertheless, sustainable development takes the climate and its long-term effect as a challenge for persons in private and public sectors who consider it a severe problem. Significant development issues are just as important in sustainable development in the efficient use of capital

in the circulatory system and social justice promotion through equal income distribution. The engineering sector has a significant role in this, particularly given the large volume of resources needed to produce and conserve the built environment for materials and energy, not to mention the amount of pollution and waste created during structures. Considering the current global urbanization rate and the speed of growth of the planet, what is developed needs to perform in all categories, economically, socially, and environmentally. The objective of this study is (i) to review the utilization of sheep wool fibre in construction industry; (ii) to review the sustainability of SWF & bamboo as construction material in the form of insulation & energy efficiency.

Section snippets

Sustainable future development

Sustainable construction is intended to meet today's accommodation, work conditions, and infrastructure demands without undermining future generations' capacity to fulfil their shelter, working space, and service requirements. Sustainable building, in other words, can be environmentally friendly in meeting these needs now and over time by cutting its overall environmental footprint while still being also creative in responding to the rising residential and commercial construction space. Given

Sustainability in the construction industry

Ecologically sustainable development (ESD) is an excellent use of capital to fulfil current and potential production needs while reducing the natural environment's adverse effects [12]. To minimize environmental impact and achieve sustainable growth, it is important to use sustainable construction materials to protect the construction sector's environment. The goal is to achieve sustainable architecture, not restrict the overall building size, nevertheless, paymore extraordinarythoughtfulness

Potentials of Bamboo as a sustainable construction material

Due to its low high tensile strength and lightweight, Bamboo has been helpful in the construction industry in many parts of the world for centuries [20]. Compared to trees such as oak and pine, Bamboo quickly grows, making construction more straightforward and less intense.

Most aspects in building design are based on local practices, where Bamboo might not have been the preferred end but may also be used for invisible elements behind walls and below flooring. Bamboo, light and heavy, are ideal

Wool (sheep wool fiber)

Nature offers a solution in wool that has for some time shielded animals from the elements. Wool insulation from herds can be used for isolation of flooring, and the millions of tiny air pockets formed by wool fiber crimped form are a thermal barrier. It doesn't burn, moisture controls, and noise isolates.Fig. 4 In other building materials, attempts were made to make use of the natural benefits of wool. In the year 2010, Spanish and Scottish scientists developed wool-made bricks using clay,

Selection criteria for sustainable construction materials

Although many studies are designed to tackle this issue, the definition of 'sustainable construction goods' is not universal. [20], [22] It is stressed that sustainable building materials are resource and energy-efficient manufacturing goods and must not have detrimental effects on safety or pollution. [18] It has built an assessment matrix to allow policymakers to balance environmental, economic, and social variables, taking the social, economic, and environmental dimensions into account while

Conclusions

This survey indicates how the SWF can be utilized in the construction industry as a powerful natural resource which justifies our objective (i). Natural resources such as bamboo and sheep wool fiber materials are provided as sustainable alternatives to most modern architectural necessities as suitable insulation materials and energy efficiency in buildings which justifies our objective (ii). The review thermal insulation of sheep wool can have comparable convectional materials and even better

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

The authors acknowledge and appreciate their colleagues.