International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 04 | Apr 2019 www.irjet.net p-ISSN: 2395-0072

GREEN BUILDING MATERIALS – An Approach Regarding Green Construction

Tarun Parihar[1], Priya U. Mahato[2], Tejas Dilip Patil[3]

[1]MITCOM, MIT Art, Design & Technology University, Pune, Maharashtra

---

Abstract -*In India, different colossal ecological issue is ascending in the development industry because of driving urbanization. Increment sought after of houses which prompt devours more vitality, assets and crude materials which are in charge of the ascent in carbon content in air and which are unsafe to condition and human wellbeing. These days we are confronting different ecological effects because of which we must work with more manageable materials which will prompt diminishment of effects on condition. In urban areas as we are now seeing the adjustment in climate designs, more blazing summers, shorter winters, lacking storms. Engineers need to discover better, more economical strategies for outlining their structures with a specific end goal to lessen their negative natural effect. In this way it is need of an hour to utilize more economical materials and locally accessible materials which are eco-accommodating and a lead for better tomorrow. Green buildings are truly ageless. In this paper, we will discuss various green building materials that will help in the reduction of carbon footprint and make the building sustainable.*

***Key Words*: sustainable, green building**

1.INTRODUCTION

Structures are really in charge of most extreme asset utilization in this manner green building is just answered for the display pattern of development. Green building is portrayed as individuals with solid, agreeable and safe living, working furthermore, exercises of the space, while the building full life cycle (material generation, development arranging, outline, development, task, and upkeep) procedure to accomplish productive utilization of assets (vitality, handicaps, the water, materials) with least effect on nature of structures, otherwise called reasonable building envelope.

Scientists from across the world have implored the natives of planet earth to make it our mission to work in the betterment of our environment and the place we live in. Today the fossil fuels are been exhausted at an alarming rate our environment is polluted by all the toxic gases emitted by the burning of these fuels. This is not a future that we should be giving to our coming generations. The environmental advantages of building a green building using Green Building Materials will ultimately lead to less waste flowing into rivers and oceans, less energy consumption and saving our assets.

Green structures will also help in reducing the construction costs since they use reusable and recycled materials which are naturally available and are utilized without harming the environment which improves indoor air quality, also improves the living quality of tenants.

2. METHODOLOGY

This paper is aimed at study and development of the green building materials in order to save our planet from pollution and global temperature rise. Also, it aims at spreading awareness among people all over the world, about the advantages and the long-term cost savings from using green building construction.

Further, the auxiliary philosophy is organized as underneath:

1. Introduction
2. Literature Review
3. Study of the research topic in detail
4. To study the research papers, articles, and magazines related to the topic of study.
5. Collection of information with the help of web surveys.

3. BENEFITS OF GREEN BUILDING MATERIALS

The Green Building materials with providing structural benefit meet the accompanying criteria:

Low or non-harmful: Materials which do not emit cancer-causing radiations or gases, harmful toxins, or aggravations as exhibited by the manufacturer through proper testing of materials.

Harmful substance discharges: Products that have negligible outflows of Volatile Organic Compounds (VOCs). Items that additionally amplify asset and vitality productivity while lessening synthetic outflows.

Low-VOC gets together: Materials which have zero or negligible VOC-delivering mixes, or no-VOC mechanical connection techniques and insignificant perils.

Damp proof: Materials that do not let dampness affect the structure or prevent dampening of the structure.

Non-Polluting Cleaning: Materials, parts, formwork that require just basic, non-harmful and low-VOC methods for cleaning.

4. GREEN BUILDING MATERIALS

After long research and review of many research paper, we have discussed a few of the Green Building Materials that can prove to be beneficiary for the environment and for the people.

i. Bamboo: Bamboo is a lightweight renewable material with high tensile strength has been used traditionally and also in modern days. Bamboo can be sought as an alternative to concrete a heavy and costly imported material in rebar and can be used in difficult to reach areas.

ii. Straw Bales: Straw bales are mainly used indoors mainly on walls, which tends to replace other costly building materials such as concrete, wood, gypsum, plaster, fiberglass, or stone. They also provide insulation from both scrounging heat and chilly colds if properly insulated as they are naturally available thus it makes them not only affordable but also sustainable as straw is also a renewable resource.

iii. Ferrock: French scientists have researched a building material that uses salvaged materials such as waste steel dust from steel industries to create a building material like concrete and tests have found that it is stronger than concrete. This extraordinary materials tarp and absorbs CO2 as a part of its drying and hardening process- making it not only less CO2 intensive and making it carbon neutral.

iv. AshCrete: Ashcerete is an alternative to concrete as it uses fly ash instead of cement. We can replace 97% of concrete components by using fly ash which is obtained as a by-product from burning coal.

v. HempCrete: HempCrete is a concrete-like material obtained from inner fibers of wood of the Hemp plant. The fibers of the hemp plant are bounded with lime to give to make concrete-like blocks which are strong and light. Hemp blocks are very light weighed so reducing the transportation at a dramatic rate and it is fast growing and renewable which add to its suitability.

vi. Green Facades: These are structures covered by vegetation in form of vines or just mesh wires covered by vegetation. These green facades act as a thermal screen and also work as a shade in sunny conditions. Green facades are used in houses to reduce overall building temperature.

vii. Clay Board: The essential part of this board is clay, frequently bound together with reed and hessian. It offers an immediate contrasting option to gypsum-based drywall. Mud board is heavier and thicker than drywall and is the best cut utilizing a saw or jigsaw

viii. Ozone Coated Materials: Green materials can also be used indoors as a major contributor to ozone removal. Eg: Perlite based tiles, UV coated sunflower, UV coated Wheat have found application in furniture, wall covering, and flooring.

5. CONCLUSIONS

Through this paper, we can understand the importance of green building materials for a sustainable and clean environment. These materials not only help in reducing carbon footprint but also help in reducing the temperature by 4-6 Celsius. Green building materials not only help in reducing the construction cost but are also provide strength and resistivity to the building. As we have studied a green building material should always be of Non-Volatile in nature should be made of naturally found materials and focusing on re-useable or recycled materials thus reducing the waste and not affecting the ecological balance.

Green building materials are today widely researched and new green building materials are found in our day to day waste items such as rubber tire, fly ash, bagasse from sugarcane, bamboo, glass and etc. Counting so many benefits of these green building materials people are still reluctant to use conventional cement, concrete in their houses or Industries. Through this paper, we want to spread awareness among people that green building materials are the future of buildings.

REFERENCES

1) Chi P. Hoang, Kerry A. Kinney, Richard L. Corsi ;Ozone removal by green building materials; Building and Environment journal (www.elsevier.com) 2008
2) Li-Jeng Hunag, Her-Yung Wang, Shi-Yang Wang ;A study of the durability of recycled green building materials in lightweight aggregate concrete; Construction and Building Materials journal (www.elsevier.com) 2015
3) Yuan-Hsiou Chang ,Po-Hsien Huang, Bing-Yu Wu, Shang-Wen Chang; A study on the color change benefits of sustainable green building materials; Construction and Building Materials journal (www.elsevier.com) 2015
4) Giuliano Vox, Ileana Blanco, Evelia Schettini; Green façades to control wall surface temperature in buildings; Building and Environment journal (www.elsevier.com) 2017

5) Mr. Apoorva V.Kotkar , Prof. Hemant Salunkhe; A Review Paper On Green Building Research; International Conference On Emerging Trends In Engineering And Management Research (www.conferenceworld.in) 2017
6) Geeta Mehta, Amit Mehta, Bidhan Sharma; Selection of Materials for Green Construction: A Review; IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) (www.iosrjournals.org) 2014.
7) Pulseli RM, Sioncini E, and Pulslli FM, Bastiaoni S. Energy analysis of building manufacturing, maintenance and use: building indices to evaluate housing sustainability. Energy and Buildings 2007; 39(5):620–8.
8) Wang W, Zmureanua R, Rivard H. Applying multi-objective genetic algorithms in green building optimization. Building and Environment 2005; 40(11):1512–25.
9) Yudeson J. The green building revolution. Washington, D.C.: Islnd Press; 2009.
10) Venkatrama Reddy BV, Jaadish KS. Embodied energy of common and alternative building materials and technologies. Energy and Buildings 2003; 35(2):129–7.
11) Ries R, Bilec M, Gokhan NM, Needy KL. The economic benefits of green buildings: a comprehensive case study. The Engineering Economist 2 006; 51(3):259–95.