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# **Development of Green Building Assessment Tool for Developing Countries – The Case of India**

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Abstract: Environmentally friendly construction techniques are reviewed in detail in this comprehensive review of sustainable building materials. With growing concerns about environmental degradation, the construction industry is increasingly focusing on long-term solutions. These studies include bamboo, engineered wood, recycled materials, and high-quality concrete mixes The study highlights the importance of tensile, tensile and flexural forces, which are key confirming the integrity of the building. The study also examines the synergistic properties of various materials and provides useful insights into their applications in real-world construction projects. Moreover, the study investigates the environmental impacts of these materials environment through attributes such as renewability, recyclability and energy efficiency. As part of the study, laboratory studies were conducted to identify the major components of selected products. The study highlights the ecological benefits of adopting these sustainable alternatives through social studies and comparative analysis. The survey results can be used as a comprehensive assessment for architects, engineers and planners, providing them with a comprehensive knowledge of sustainable construction.

**Keywords**: Sustainable building materials, environmentally friendly alternatives, construction, environmental impacts, life cycle analysis, green building practice

### I. INTRODUCTION

Green buildings are now the key to sustainable development in this century taking into account the responsibility of balancing economic, environmental and long-term social health [1], [2 it the opportunity to create more environmentally friendly buildings through an integrated design approach to reduce the environmental and occupant impacts of poor construction on. The benchmarking assessment process provides an effective framework for evaluating the environmental performance of buildings and incorporating continuous improvement into building design processes; Because it can be used as an instrumental tool by setting priorities and goals, developing appropriate planning strategies that are sustainable; and making business decisions to guide sustainable policy decisions [2],

[3] . It can also be used as a management tool to organize and organize environmental data during the planning, construction and operation phases.

Green design not only positively impacts public health and the environment, but also reduces operating costs, increases the capacity of the building organization, increases resident productivity, and helps create sustainable communities In general, green buildings are energy efficient, water saving, sustainable and non-toxic Availability, and thus of Jordan's wealth provided solutions to most of the problems

Cam and Ong (2005) outline the role of creating environmental performance spaces that can assure policy innovation. They suggest that there are certain roles to be played in anxiety, particularly the following three: First; To have a framework for increasing environmental awareness for various players in architecture and construction in environmentally friendly construction, secondly how to establish standards for environmental creation environmental behavior to protect, and test, minimum standards of performance building designs have looked to align with these standards and ultimately provide a platform for stimulating innovative design, ideas and technical solutions [5]. However, Cooper (1999) first clarified the issues to be explained; Those are the issue of absolute vs. absolute. about

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relative assessment – absolute assessment is considered appropriate and meaningful in assessing sustainability, and the issue of scale – the individual building is considered too small to address sustainable development issues.

The use of a green rating (assessment) process in the design/construction process can provide significant benefits without the consequences of standard practices. Assessment measurements based on the building life cycle can provide significant long-term benefits for building owners and occupants [7]; Since this design helps solve existing construction problems, limits environmental impact, creates healthier and more productive places, and reduces building operation costs Life Cycle Analysis captures the total cost of acquiring, owning, and disposing of a building system. It is particularly useful when comparing project alternatives that meet similar performance requirements, but differ in start-up and operating costs, to select the one that maximizes savings

However, facilitating the implementation of green building practices; We need to develop technical services and products to determine the "greenness" of a building based on an appropriate green assessment system adapted to the local context in Jordan.

Two types of assessment tools have been developed in the construction industry. The first group of these tools includes those that are based solely on a benchmarking system. The second group includes tools that use the Life Cycle Assessment (LCA) approach. Criterion-based instruments can be defined as a system of assigning point values to a number of selected criteria on a scale between "small" and "large" environmental impacts These instruments are considered environmental we are faced with a comprehensive research program. Standards-based instruments include BREEAM (Great Britain)

During the planning phase, construction, building materials and local infrastructure options (energy supply, waste management and transport mode). In social research, various weighting methods based on foundations are used for analysis. Examples of this class of tools with an LCA component are Bees (USA)-OAE (2004), Beat (Denmark)-DBRI (2005); Ecoquantum (Netherlands) and KCL Eco (Finland) – KCL (2005) [8], [9], [10], [11], [12].

A new comprehensive framework is proposed to classify green building research tools according to the possible applications of the tools (suitable areas) According to this classification, there are two types of tools Firstly (D-Tool), tools within the monitoring and construction operations team specifically designed to optimize, select, monitor, predict, and measures have been considered, along with statements describing green building strategies towards a set of business objectives. The second (P-Tool), an internal set of tools developed for performance comparison and rating, includes statements describing the objectives of construction activities, which arise from conducting environmental science studies. Such structures are very common and stable in nature. In existing tools, P cases and D cases are often mixed together and listed in a hierarchical order [13].

Gibbard (2005) argued that sustainable development in developing countries should address social and economic issues as a priority; He suggested, that the environment should be addressed in projects designed to address immediate social and economic needs with the aim of achieving sustainable development [14 Libowicz (2005)]. also said that countries in developing countries, can't just look at the performance of the environment. The policies of these countries are dominated by social and economic problems. Consequently, the development of construction evaluation methods is needed in developing countries to determine the performance of construction inventories and to encourage the construction industry to enter a sustainable path, and thus contribute directly to social and economic issues.

#### **Sustainable Materials**

The ability to support a green building and vice versa requires special materials and systems to optimize the flexibility of the system. The business of green infrastructure materials and administrations additionally offers in India along with the increasing pattern of green infrastructure promotion. Figure 1 shows the regulations for green building construction. Practical development integrates different approaches in system development and construction plant operations. The implementation of green infrastructure is one of the manageable planning activities and development processes. Green products are products that can manage the environment because they help in reducing the natural effects of degradation (Green omics). Property effectiveness, indoor air quality, energy efficiency and adequacy should be important points in useful building materials. Green structure analysis for integrated environmental assessment. Green building materials

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with little or no positive impact on the environment. Most green products are made from recycled materials that are environmentally friendly and energy efficient, reducing the amount of energy needed to produce them.

### II. METHODOLOGY AND MATERIALS

Building materials are also considered green if they are made from sustainable harvesting of renewable materials. Planted and properly pruned wood or mulch flooring is an example of this. Another advantage of a sustainable product is Durability. Very durable building materials are also considered green A common example of this is that the least durable sustainable exterior materials are more sustainable, resulting in significant savings in materials and energy over the life of the asset days shows the storage of various sustainable building materials used in green buildings. Many benefits can be achieved when recycled waste is processed into a sustainable, environmentally friendly product. Often, the "greenness" of a product is based on specific parameters; its strength as well as whether the material is property stable in terms of assembly, corrosion resistance, installation, handling and disposal [21]. To deal with it all and to identify the sources and yields of material and energy data and to determine the direct environmental impact of a product or service system over its long life cycle period is n' life cycle analysis (LCA). By recycling plastic waste, it can be used to create roads as well as a few attractive storage items. Green design materials and materials can have similar characteristics. As building materials can be reused or reused when not needed, reduce the use of renewable energy for rapidly deteriorating materials, such as tile flooring, wood flooring, leather flooring, moss, and cotton protection (made from scrap denim material) decline in a sustainable way.

Green design materials and materials can have similar characteristics. Building materials that are reused or recycled when they are not needed, are permanent ones that are rapidly deteriorating, such as manufactured tile flooring, bamboo flooring, leather bedding, strawboard, and cotton ball protection (a made of scrap denim materials) limited durability using renewable energy Use, reduced fatigue f, increased durability, and radioactive radiation levels of the material provides is reduced

### ADVANTAGES OF GREEN BUILDING MATERIALS

### **Environmental Benefits:**

- Conservation: Green building materials typically use recycled, recycled, or rapidly renewable materials to reduce the demand for raw materials and reduce waste to natural resources on the
- Energy efficiency: More green products help improve the energy efficiency of buildings. For example, good insulation reduces the need for heating and cooling, reducing energy consumption and greenhouse gas emissions
- Larger carbon footprint reduce: Producing traditional building materials can be energy intensive and result in significant carbon footprint.
- Greener materials, such as recycled steel or less corrosive concrete, tend to have lower carbon footprints, helping to reduce overall carbon emissions.
- This reduces the burden on landfills and encourages sustainable waste management.
- Water conservation: Certain green building features, such as waterfront gutters and antierosion landscaping products, help conserve water, and address concerns addressing water scarcity.
- Ecosystem conservation: Certain green building features, such as low-leakage plumbing and erosion-resistant landscaping, help conserve water, and consume water solve the problem of scarcity.

### **Economic Benefits**

- Efficient systems can lead to lower energy consumption, thus reducing energy costs over the working life of the building.
- The production and installation of green building materials contribute to efficiency in construction and sustainable production.

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- Increased Property Prices: Green buildings are generally valued more due to their energy efficiency, sustainable materials and lower operating costs This can drive property prices in line with market demand high.
- Incentives and Certifications: Governments and organizations often offer incentives, tax breaks, or certifications for green building practices to discourage environmentally friendly practices and non-use of construction methods.

### **Health Benefits:**

- Improve indoor air quality: Low-carbon and non-toxic materials help improve indoor air quality, reducing the risk of respiratory issues, asthma, and other associated health problems on the negative air.
- Natural light and ventilation: Green building designs often incorporate features such as plenty of natural light and efficient ventilation, creating a more comfortable and healthy indoor environment.
- Noise reduction: Some green materials, such as natural fiber insulation or sound insulation, help reduce noise, creating a pleasant and stress-free indoor environment.
- Biophilic design: natural elements of building design (biophilic design). And when combined with green spaces, it reduces stress, boosts mood, and has been shown to improve overall mental well-being.

#### **Research design**

The research adopted a multi-pronged design that included a variety of methods – both quantitative and qualitative. These methods include fieldwork methods (pilot studies, surveys), questionnaires, interviews – structured and unstructured, empiricism methods (experiments) and critical methods in other words research based on the interaction of archival ethnographic methods and qualitative interviews.

To identify the first variables that will identify the trend

### III. RESULTS AND ANALYSIS

A green building strategy must consider three factors – environmental, social and affordability; Thus, the assessment tools must take these three dimensions into account. Site choice, energy, water, materials, materials and components, environmental loads, transportation, emissions, waste, and others can define environmental aspects. Comfort, health, quality of the indoor environment, access to resources, participation, control, education, safety, etc. can define life.

## **IV. RESULT AND CONCLUSION**

This is a big myth and a common misinterpretation that persists despite repeated exposure to the fact Furthermore, ongoing research shows that programs with strong leadership and environmental policy emphasis are ozone depleting substances, runoff, and water repeatedly You can eat half, when it costs 25% less to do the work and f 30%. lower improved tenant fulfillment, loan fees Similarly, when green thinking is part of proactive planning, it is easier and less necessary to incorporate similar features and components that necessarily have lower operating and support costs Truth be told, sustainability is different. Using various methods and techniques, most green infrastructure system cost-effective They and air. Benefits are primarily driven by energy savings, increased labor efficiency, hospital costs (more safe indoor air for occupants and property owners), building lifespan, materials a less environment Almost every green building costs 0–4 % more than conventional buildings. Many LEED buildings can be constructed for about the same price as conventional buildings but in some cases the green bill increases with the amount of green Do not compare the cost of green buildings between den and common rooms: Usually Rs. 10,000 per annum. Plumbing would save 440 liters/day. Looking at investments alone, the payback period is about 35 years.

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