Chapter 2
Role of Renewable Energy Techniques to Design and Develop Sustainable Green Building

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ABSTRACT

This chapter presents the role of renewable energy techniques to design and develop a sustainable framework for green building. The first viewpoint is identified with the earlier structure and the low encapsulated energy building materials for the design and development of a framework for green building. The primary perspective is to manage energy protection using renewable energy techniques in the green building. Green building interchangeably can be used with the term's sustainable construction or green construction. So, durable construction means using environmentally responsible and resource-efficient procedures in development to be ensured of sustainability throughout the lifetime of the building. This chapter also presents the combination of renewable, energy-based technology for green building construction and sustainability with the economics of renewable energy.

INTRODUCTION

A green building refers to a structure which is developed, designed, built, operated, re-used or renovated in a resource efficient and ecological way that is also called as a sustainable building. Generally, in environmental terminology, a sustainable system can be described as a living system which continues as a result that the resources are not used up faster than what can be replenished naturally. A sustainable economic policy in terms of financial terminology can be defined as one in which the expenditures are less or at least equal to the income. A sustainable social system in terms of common terminology can be described as one in which empowerment of members is done to collect; as a result, a synergistic whole is created. It is progressively clear that decisions that are made on an individual level have an effect on

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the global scale and vice-versa. Through energy efficiency, energy preservation of the green building has gained important significance everywhere in the world. The four primary viewpoints for renewable energy production in a green building incorporate as a matter of first importance the about zero energy uninvolved building plan before genuine design and development, also the utilization of building materials that are of low energy amid its growth, and utilization of energy efficient types of gear for the low operational energy necessity and the ultimate mix of sustainable power source advances for different applications. These perspectives have been talked about alongside their financial matters and natural effects for future generation. During the current period, the habitat and dwelling and are linked invariably, making buildings as convenient and comfortable possible all across the world. By investing 30 to 40 percent of total essential resources of the world, the building sector is moving at an exponential pace. In the current period, after industry and agriculture, the most significant consumer of energy from fossil fuels is buildings. The European Commission has initiated the Asia-Link program to spread and promote the knowledge with the close approach of zero energy on a sustainable built environment. In this program of the sustainable built environment, there is the integration of the building for various applications such as cooling or heating, water heating and electricity production with the proven technologies of renewable energy. All over the world, in the building, the use of operational power insignificant. Hence, for sustainable development, all over the world, assessment of sustainability framework is required especially in the building sector. Reduction in depletion of resources that are critical such as water, raw materials, and energy is the main aims and targets of sustainable design; environmental degradation to be prevented which is caused by infrastructure and benefits in the whole life cycle; and develop environments are to be created that are effective, productive and safe utilization of the solar and water energy.

GREEN BUILDING

Two additional imperatives must be satisfied with the construction of a natural green building: the renewable of natural materials, alongside the measurable data and from the landscape to its adaptation of the architecture. According to original data the selection of the site must be made. Architectural forms must not use artificial color rather than take inspiration from nature. The material provided by the environment must be used in natural building techniques. The use of natural material is highly recommended as these materials replace synthetic products as their production consumes energy in huge quantity. The raw materials are covered under the term “natural materials” that can be used either accordingly to modern techniques or traditional craft methods. The construction standard refers to the expression “passive building” that can be accomplished using a different variety of materials used for construction. It can be interpreted as a green building construction which claims the climate of the interior is as comfortable as without the need for a conventional heating system in winter as it is summer. For obtaining low energy consumption, this is one of the conditions. The following requirements must be fulfilled to build a passive building: to capture passive solar energy building’s orientation; triple-glazed windows of high quality. Such as, by taking into consideration the direction of a structure and change its windows, to catch the passive solar heat, architects and promoters must keep in mind that energy consumption should be less than create their designs, enhance the aspect of sustainable development and daylight penetration improvement, which increases the productivity of employee without incurring additional cost of construction.