Chapter 6
LEED Certification and Sustainable Building Practices:
A Comprehensive Guide to Efficient and Sustainable Facilities

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ABSTRACT

This chapter delves into the principles of Environmental Architecture, focusing on the integration of sustainable design for efficient and sustainable building facilities. It explores how sustainable design optimizes building performance, minimizes negative environmental impacts, and balances cost, environmental, societal, and human benefits. The chapter highlights key strategies such as optimizing site potential, minimizing non-renewable energy consumption and waste, using environmentally preferable products, protecting and conserving water, improving indoor air quality, and enhancing operational and maintenance practices. It emphasizes the holistic approach of sustainable design, which positively impacts all phases of a building's life cycle, encouraging compromise and trade-offs for a more sustainable future.

INTRODUCTION TO ENVIRONMENTAL ARCHITECTURE

Environmental architecture is a design philosophy that emphasizes the integration of environmental considerations into the planning and construction of buildings. This approach aims to minimize the negative environmental impact of buildings,

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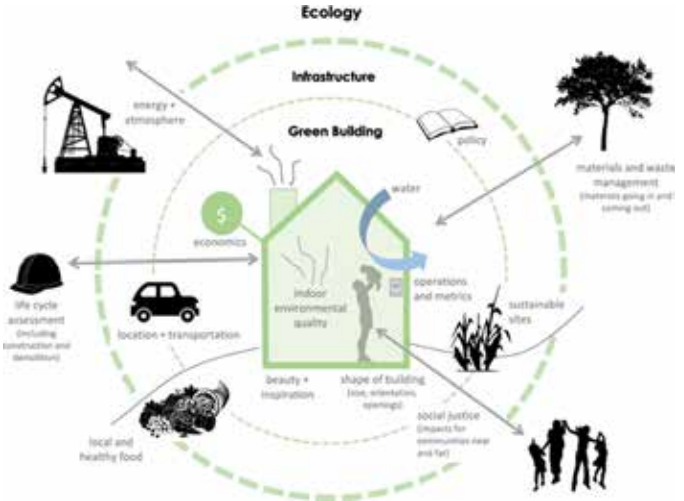
maximize their efficiency, and promote the well-being of their occupants. Environmental architecture's philosophy is rooted in the belief that buildings should be designed to be energy-efficient, use sustainable materials, and incorporate renewable energy systems. Moreover, other areas such as water conservation, natural light and ventilation, and the promotion of occupant health and well-being are considerations rooted within the environmental architecture (Wines, 2009). The importance of sustainable design principles in environmental architecture are multifaceted. It not only addresses the environmental impact of buildings but also considers the social and economic aspects of sustainability (Mohammed, 2021). Environmental architecture contributes to the reduction of carbon footprints and makes buildings more resilient to climate change. It also promotes the use of renewable energy sources, such as solar and wind power, which are crucial for a sustainable future making the transition to net zero more plausible (Mohammed, 2021).

Figure 1. Factual and conceptual green building knowledge, 2019



(available from: International Journal of STEM Education)

This diagram shows the many ways that green building themes can be connected to broader social and ecological systems.

Environmental architecture seeks a responsible use of building materials, including the use of recycled, reclaimed, or renewable materials that require less energy to manufacture (Hussein, 2023). These materials should be locally sourced and free from harmful chemicals, making them more sustainable and environmentally friendly. The design of buildings is carefully planned to ensure that they blend with