



## Design of Residential-Tourist Buildings According to the Environmental Conditions of Iran's Coral Islands; the case study on Hendourabi Island

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### Abstract

**Research Problem:** Sustainable development of coastal tourism in the coral reefs requires environmental considerations, cost reductions in energy supplies, and comfort for tourists. The expansion of coastal tourism in the coral islands without environmental considerations has caused coral reefs to be destroyed in the islands. Since the design of tourism buildings plays a pivotal role in the physical development of tourist beaches, providing appropriate solutions to assist this goal is essential. It is obvious that planning and design processes in coastal areas and islands - which are essentially facing functional and bio-indigenous complexities. This process is not like cities and regions without sensitive ecosystems but requires an integrated and environmentalist approach.

**Research Question:** How can effective steps such as form, location and location of the building, installation of awnings, the color of the building, material of the surrounding walls and how to zoning the interior spaces, an effective step in adapting to the environment, increase energy efficiency, and reduce inappropriate effects? Remove fossil fuels?

**Research Aims:** Because of the physical development of tourist beaches, buildings are the most energy consumed, as well as waste, sewage, and environmental pollutants, it is necessary to provide appropriate strategies for correcting consumption patterns and reducing pollution. In this research, by analyzing the ecosystem of the coral island of Honduran and considering its climatic and environmental parameters, an optimal model for designing residential and public buildings with an approach to reducing energy consumption and pollutants has been presented.

**Research Method:** The research methodology was based on bioclimatic and energy analysis on the relationship between building and environment through field study and simulation. Construction components, architectural form, and landscaping have been interfering variables in this research. By using the Design-Builder, modeling software, and registered release in non-dynamic conditions, the number of energy needs was evaluated internally and externally.

**The Most Important Results and Conclusion:** The result of this study showed that passive methods can reduce an important part of the amount of energy required by interacting with the supply medium or its amounts. Also, using vertical and horizontal combination shaders, creating ventilation shutters, porches continuously, lightweight, homogeneous and polymeric insulators, utilizing the atrium, and rotation to the coastal winds can reduce the cost of generating energy by up to 75 KWh/ym<sup>2</sup> and the cooling load significantly to be reduced. In the results of the research, the implementation of the proposed strategies indirectly leads to a reduction of greenhouse gas emissions of up to 126 tons per year for the simulated sample. In the end, by presenting an integrated design model for tourism collections through the adaptability table that is the resultant and inseparable inference of the three layers of human information, environmental factors, and environmental factors, designers will be able to maximize coordination in All significant and significant areas to achieve the necessary results for the best physical and functional conditions,

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taking into account human needs, adaptation to environmental conditions in terms of aesthetics, and reducing energy consumption and environmental pollution with a reduction in pollutants.

**Keywords:** Tourism, Climatic Design, Hendourabi Island, Energy, Comfort, Cost, Modeling

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