

Towards Low Energy Buildings through a Prototype of Desert Rural House in Alwadii Algadid in Egypt

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Abstract:

Desert Vernacular architecture is one of the maximum important factors for the retrofit of the desert rural house. Vernacular architecture primarily based totally on increase thermal comfort and reducing energy consumption to improve indoor air quality inside the spaces. Alwadi Algadid (New Valley) Governorate establishes 46% of Egypt area. So, we should obtain profit of this greater zone to decrease the pressure over the Nile valley. In addition, this research aims to categorize the influence of desert vernacular architecture of desert rural house. Design/methodology/approach – The architecture of Alwadi Algadid contains the particular architectural form of a warm zone, which previously had an operational tradition aimed to a sustainable architecture and improvement through cultural, economic, geographical, and climatic criteria, to use the local materials, treatments within the basic principles of sustainability, at the lowest possible cost to minimize utilities running cost of these communities. The prototype house was designed by Design-Builder simulation software depend on an awareness of desert vernacular architecture. Findings – In conclusion, the simulation findings of the prototype building models were evaluated with the base case building with more than 50% reduction in energy consumption. The results gained in this research could supply valuable ideas for the desert rural house design of residential buildings. Practical implications – Applied of using local materials, local technique and local treatment to confirm district suitability of the desert vernacular house outcome. Originality/value – The value of this research is to design guidelines for future vernacular settlement of desert rural house and establishments with respect to old ones.

Keywords:

Vernacular architecture, Prototype building models, Energy consumption

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