The Environmental Concept of the House in Hassan Fathy Architecture

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Abstract:
The growing interest in the importance of rooting the concept of environmental architecture in the design of modern buildings with the adoption of environmental sustainability methods based on ecological aspects and the application of modern technological technologies poses a new challenge to the field of interior design in how to deal with design data and hypotheses of overlapping dimensions aimed at putting environmental considerations in its most important priorities in order to achieve the material and spiritual needs of the user. Despite the novelty of thought in the production of outstanding architectural works in their designs that mimic the surrounding ecosystems, they missed in many elements of their interior designs to embody internal spaces that take into account not only the application of environmental determinants from a physical perspective based on the use of natural materials and the attempt to maintain thermal performance within the building but also lacked to achieve psychological comfort and achieve organic communication between its internal spaces and components. The interior designer should consider integration and inclusiveness in developing principles for adapting to environmental conditions based on the function of vacuum and its preparation for integration with the external environment. These principles should not rely entirely on technological solutions or what raw materials science research has produced, as such applications are not available to all specialists besides the high cost of implementation methods, hence design processes interested in simulating the ecosystem must address different alternatives to solutions through which the designer can create a kind of integration according to the possibilities available and also in accordance with the nature of the site and the environmental conditions surrounding it while not ignoring social and cultural determinants. The design of the interior space according to the ecosystem must take into account from the outset the structural method, the structural elements of the building, the energy system to be available and how the physiological and psychological impact on the comfort of users, and the identification of the method of construction and the quality of the ore used besides mass formation in order to achieve good management of energy consumption in the interior is considered one of the foundations affecting the formulation of the internal space and the definition of its limitations. The research aims to try to reach an actual simulation of the energy system to achieve adaptation and compatibility of the internal space and its elements with the surrounding environment and to consider the economic dimension before the implementation process. Research Problem: - How to achieve organic integration between the interior and the surrounding environment? - How to find different alternatives to design solutions according to the possibilities available and in accordance with the surrounding environmental conditions? Research Goal: - Learn about the most important features of Hassan Fathy’s interior space design. - Try to identify the most important factors of environmental success of the dwelling in Hassan Fathy building through environmental analyses using digital software. Research Hypothesis: The research assumes that when simulating successful environmental models of the dwelling such as Hassan Fathy Building, it can be used to reach positive solutions in the environmental design of contemporary dwellings. Research Results: - The design of the interior space according to the ecosystem must take into account from the outset the structural method, structural building elements, the energy system to be available and how physiological and psychological impact on the comfort of users. - The presence of the building in a single place not surrounded by any other buildings around it leads it to exposure to the façade of the western building of the sun throughout the day and the decrease in the degree of radiation in the morning on the eastern façade with its height in the afternoon and its moderation in the afternoon to return to increase again in the sunset, and one of the most important reasons for the exposure of the building to solar radiation throughout the day is the presence of the building in a single place not surrounded by any other buildings around it. - When simulating the dwelling, it was observed to maintain the intensity of natural lighting very strong in the courtyard and service spaces and medium in the interior spaces and this is commensurate with the requirements of the function of each vacuum in the dwelling. - Materials are one of the
most important elements to be considered in the design where when using Hassan Fathy thick walls in the construction of the dwelling led to a reduction in the temperature inside compared to the surrounding environment with a hot climate. Through an analysis of the design alternatives to the building model to measure the rate of change of solar radiation present in the building compared to the solar radiation present in the surrounding environment, the following is clear: - Hassan Fathy’s construction method has a significant impact on improving the quality of the internal environment. - Domes are only an element of lighting, but their presence or not has no A noticeable effect in reducing the temperature within the inner space. - The height of the architectural openings is considered relative and proportional to the height of the building and the area of the architectural opening must be studied well when designing for its great impact on the ventilation path and therefore in the temperature as well as its role in determining the amount of lighting reaching the interior space. - Taking into account the most appropriate material with the climate of the region in which the design is located Leads to the quality of the internal environment. - The most important factors of the success of the buildings designed by Hassan Fathy is his consideration of the surrounding environment, both in terms of climatic factors, we find that the direction of solar radiation and its resulting temperature, ventilation and lighting through guidance and materials located in the environment, and from an aesthetic formality, mimic the forms of Islamic architecture in accordance with the Egyptian taste in the timing of its construction through internal vacuum treatments and find the courtyard in the house and the bar. - The design and elements of the interior space play an important role in improving the environmental performance of the building functionally and in giving a sensory dimension that reflects positively on the user.

**Keywords:**
- Environmental Modeling
- Energy Management
- Internal Environmental Quality
- Digital Technology

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