

**Ministry of Higher Education and Scientific Research
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College of Engineering**



The Technical Solutions in Achieving Sustainable Architecture in Hot Dry Climate

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IN THE NAME OF GOD MOST GRACIOUS MOST MERCIFUL

The technical solutions in achieve sustainable architecture in hot-dry climate
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Abstract:

The natural environment with its all recourses is the God's great gift to Man, which should be preserved and maintained for the present and future generations. The role of architecture is to provide a built environment, which is taken care for Man's safety, health and psychological and physical comfort. This built environment (The building) is a part of the natural environment, what happens in the part affects the whole, and it is in a constant reaction influencing and influenced in order to provide luxury and happiness. The Buildings and construction directly and indirectly cause most of the environmental problems ; they are a huge consumers of natural resources and waste producers that affect on the ecological system balance and causing from that environmental stress in the way of their consume energy and water this on one hand, and in the production of wastes on the other hand, and accordingly , all these will threaten the continuity and sustainability of the human and ecological settlements. Present human lives in a revolution in electronic and communication field. Despite what achieved in the past and what intended to be achieved in the future, we should be warned about the costs to be paid for luxury and progress, depicted in depleting natural resources and environment pollution which threat human present and future by causing big damages Hence, we find that the great challenge faced the human civilization is a technical one to turning towards the adoption of a new energy policy which demands the reduction of its consumption without causing changes in human's comfort and their luxury to find sustainable built environment. imposes on Man to development of new techniques that might essentially reduce the resulting buildings' pollution through the employment of clean and friendly environment energies like (solar energy, wind energy, geothermal energy), and can we test it by using the computer programs concerning testing and application to change the form of architecture by highlighting new aesthetic laws.. Today architecture contains clearer solutions to save energy and environmental problems over years through the use of the most intelligent techniques which highly respected the natural resources in harmony with the environment and their contribution in making use of the natural resources to generate power and thermal energy.

Hence, **the main problem** of the research has been embodied in the absence of knowledge concerning the role of technology and the ways and means of utilizing it to achieve a sustainable architecture and choosing the suitable in hot-dry climate, with determining **the special problem** in incompleteness of knowledge base with clean energy technologies and the ways of employing them in architecture. Thus, the **main research aim** was determined in providing the knowledge about the technology's role and the ways and means of utilizing them to achieve a sustainable architecture in a hot- dry climate. As to **the secondary aims**, they can be summarized in building the knowledge base of the clean energy technologies (solar energy, wind energy, geothermal energy) and the mechanisms of their application to provide a comfortable human environment that suits the hot-dry climate, as well as identifying the suitable alternatives and mechanisms in the light of technology and their potentialities concerning (operation and maintenance) and the range of their fitness hot-dry climate and which are responsible for changing the traditional kinds of energy generation for the thermal and electrical uses. Research has relied on the several hypotheses:

Main hypothesis: sustainability in architecture is achieved by using new forms of clean energy technologies and its integration with the building in hot-dry climate. This hypothesis depends on a group of **secondary hypotheses**, which can be listed as follow:

The integration of clean energy technologies with the building results in great economical benefits, furthermore the effectiveness of energy technologies increases with efficient energetic constraints design building envelop which required the research completion in four chapters:

Chapter one: deals with sustainability subject as the new environmental challenge, present, intellectual concepts, and studies about determining its concept and applying mechanism, and how to reverse this in architecture field. **Chapter two:** deals with the sustainable future as a new visible model, and determining the most prominent alternatives paths to achieve that by using renewable energy taking into consideration sustainable design. **Chapter three:** deals with technology as a

mechanism to achieve sustainable architecture and determine the important ways and the possible means in employing clean energy and its integration with architecture, with taking into consideration and discussing the possibility of applying this experiment in Iraq. **Chapter four:** reaching to a group of, general and special conclusions and recommendations that support the hypothesis of the research.