

Natural Cooling Systems in Sustainable Traditional Architecture of Iran



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Abstract:

This paper concentrates on the results of sustainability caused by natural cooling systems in Iranian traditional architecture of hot-arid regions.

Sustainability in architecture means conserving constructions for the future, in terms of physical durability planet protect conserving on energy resources.

In this case, it seems that sustainability would be based on the introduction productive models in which available materials and resources are used more efficiently, rather than being ignored. Nowadays, the knowledge of building ecology focuses on its capacity to integrate environmental and climatic parameters into design and thus enhances space qualities such as comfort ability.

In a vast country such as Iran, with different climatic zone, traditional builders have presented a series of logical solutions for human comfort. Traditional architecture of Iran is perceived sustainable for having sustainable features. It is able to response to environmental problems from a long period. Its features are based on climatic factors as well as local construction materials of hot-arid regions and natural cooling systems are one of these features.

There are various natural cooling systems in traditional architecture of Iran like: Shoadan, *Khishkhan*, *Shabestan*, *Hozkhaneh* and *Badgir* or wind tower.

Wind tower is an architectural element in traditional architecture of Iran. That is seen in hot climates, hot& dry and hot& humid. Wind towers are seen like vertical figure in sky line of residential quarter in ancient cities.

It is vertical shaft with vents on top to lead desired wind in interior spaces and provide thermal comfort. It profits by sustainable energy to merge architecture with its surrounding nature. It makes available auditable natural ventilation which is known as an important principle for conserving energy. Traditional building techniques are normally well adapted to the climate and we can use them with new technology.

This paper concludes that according to some factors it is possible to address Iranian traditional architecture. Iranian traditional architecture delicates effect of climatic forces on forming of habitable spaces and it explains climate was seen like environmental- constructional subject. It is undeniable importance use of sustainable and renewable source of energy such as wind structure and form of building. Result of this approach is harmony with nature.

In this research wind tower is considered in filed of function, structure, form, details, components, ornament.

The aim of this research is to demonstrate the rule of natural cooling systems in sustainability of traditional architecture in hot-arid climate of Iran.

Keywords: Sustainable architecture, Iranian traditional architecture, Natural cooling systems, Wind towers, hot-arid regions