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## Sustainability, architectural topology and green building evaluations of Kashan-Iran as a hot-arid region

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### Abstract

Although Green Building is one of the familiar subjects all over the world, it is a recently known field in Iran. This subject has been developed to expand the communications between domestic architecture and foresight in order to protect the environmental and climatic problems. This work generates a detailed comparison between modern and traditional housings by considering sustainability in energy and resource consumptions, architectural topology and green building evaluations in Kashan as a hot-arid region of Iran. The investigation shows results in several design-related methods which are suitable to contribute as efficient use of energy and domestic resources. Finally, this work puts forward a set of recommendation to enhance the sustainability of future Kashan buildings.

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### 1. Introduction

Green building (GB) is part of the concept of promoting sustainability [1]. It Should be understood: in the full life cycle of buildings, to maximize conservation of resources (energy, land, water and materials), protect the environment and reduce pollution, provide people with healthy, appropriate and efficient use the space, and natural harmony of the building [2]. The success of a GB depends on the quality and

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efficiency of the installed green systems. If the building lacks these essential features, it will neither accomplish the environmental goals nor generate the estimated benefits. Thus, the market requires a common way to differentiate GBs from traditional buildings through the use of standard, transparent, objective, and verifiable measures of green, which assure that the minimum green requirements have been reached. Because of a high level of economic growth and increasing population in developing countries such as Iran it is necessary to experience a substructure expansion with respect to traditional residential building style. Many years ago, although there was not enough technology in order to provide welfare for inhabitants as much as recent years, Iran had powerful architects who did not have academic education, and also effective architecture, especially in hot-arid regions. However, when compared to current buildings, although the location of the buildings is equal, but the designs are changed. Unfortunately, with regard to current buildings in Kashan the issue of energy and resources efficient throughout a building's life-cycle is not given serious consideration. In addition, Kashan is one of the driest regions in Iran and is facing serious problems relating to water demand. In order to achieve this goal, Iranian architects should make a building in which water and energy consumption are minimized and pay more attention to climate to make a sustainable and environmentally friendly design. The paper firstly provides an overview of traditional status of Kashan city and building in terms of sustainability. Next, depictions are given of methodology adopted in ancient sustainable houses, which were selected as a case study for the purpose of this research. And estimation of energy and water use within this building. Finally, recommendations to enhance the sustainability level within Kashan buildings are set given, see Fig 1

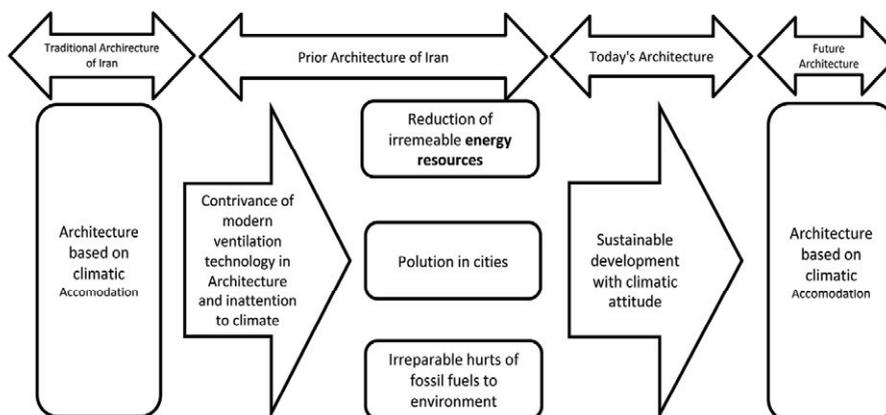


Fig. 1. Gradual process of energy consumption in Kashan Architecture.

## 2. sustainable statue in Iran-Kashan sector

A green building, also known as a sustainable building, is a structure that is designed, built, renovated, operated, or reused in an ecological and resource-efficient manner. Green buildings are designed to meet certain objectives such as protecting occupant health; improving employee productivity; using energy, water, and other resources more efficiently; and reducing the overall impact to the environment. According to the fact that, in recent years there are concern about environmental and energy resources, there is interest in planning and designing with respect to the concept of Green Building. Green design does not only make a positive impact on public health and the environment, it also reduces operating costs, enhances building and organizational marketability, increases occupant productivity, and helps create a

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