Reverse Analysis of Wind-Catchers of Ab-Anbars in Iran for Coming to Innovations in Sustainable Architecture

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Abstract:

Due to the specific climate and geographical conditions of Iran, Iranian architects have considered different factors, including economics, independence, etc., and have been able to save energy by applying functional principles and the principles of their local architecture and using natural energies like wind, water and solar energy, etc. Because of factors such as shortage of rivers and springs that are constantly full of water and low groundwater level, high temperature and dry environment of deserts, water has become quite valuable. by coming to a comprehensive understanding of the principles of local architecture, Iranian architects started to create water transfer systems with specific properties. Our ancestors have created a system for transferring underground water with specific hydraulic features. After transferring water to the place where was supposed to be consumed, they would store the drinking water in Ab-Anbars. One of the Cities that have numerous Ab-Anbars is Yazd. These Ab-Anbars are composed of different components, one of which is the wind-catcher. Ab-Anbars vary in terms of the number of wind-catchers they have. The arrangement of each of these Ab-Anbars has a certain order relative to the dome of the Ab-Anbars. In the present study, the aforementioned issue has been reviewed through a reverse analysis of Ab-Anbars and the primary hypotheses and it has been found out that architects in the past used this kind of arrangement to use sustainable wind power as best as possible (in a way that they used an artificial wind cycle for creating airflow) and to prevent water from becoming dirty and rotten. In the following sections, we will introduce an idea for a better usage of sustainable energies as a pattern.

Keywords: Wind-Catcher, Ab-Anbar, sustainable energy, innovation.