

## **A Study on Shavadoon Underground Living Space in Dezful and Shooshtar Cities, Southwest of Iran: As a Sample of Sustainable Vernacular Architecture**

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**Abstract :** Shavadoon is a type of underground living space, formerly used in urban residences of Dezful and Shooshtar cities in southwestern Iran. In spite of their high efficiency in creating cool spaces for hot summers of that area, Shavadoons were abandoned, like many other components of vernacular architecture, as a result of the modernism movement. However, Shavadoons were used by the local people as shelters during the 8-year Iran-Iraq war, and although several cases of bombardment happened during those years, no case of damage was reported in those two cities. On this basis, and regarding the high seismicity of Iran, the use of Shavadoons as post-disasters shelters can be considered as a good issue for research. This paper presents the results of a thorough study conducted on these spaces and their seismic behavior. First, the architectural aspects of Shavadoon and their construction technique are presented. Then, the results of seismic evaluation of a sample Shavadoon, conducted by a series of time history analyses, using Plaxis software and a set of selected earthquakes, are briefly explained. These results show that Shavadoons have good stability against seismic excitations. This stability is mainly because of the high strength of conglomerate materials inside which the Shavadoons have been excavated. On this basis, and considering other merits of this components of vernacular architecture in southwest of Iran, it is recommended that the revival of these components is seriously reconsidered by both architects and civil engineers.

**Keywords :** Shavadoon, Iran high seismicity, Conglomerate, Modeling in Plaxis, Vernacular sustainable architecture

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