

Author's Accepted Manuscript

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PII: S2352-7102(17)30518-1
DOI: <https://doi.org/10.1016/j.jobee.2017.12.014>
Reference: JOBE386

To appear in: *Journal of Building Engineering*

Received date: 26 August 2017
Revised date: 30 October 2017
Accepted date: 27 December 2017

Cite this article as: Amin Mohammadi, Mahmoud Reza Saghafi, Mansoureh Tahbaz and Farshad Nasrollahi, The Study of Climate-Responsive Solutions in Traditional dwellings of Bushehr City in Southern Iran, *Journal of Building Engineering*, <https://doi.org/10.1016/j.jobee.2017.12.014>

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The Study of Climate-Responsive Solutions in Traditional dwellings of Bushehr City in Southern Iran

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Abstract

The present study aims to identify climate-responsive solutions used in traditional dwellings of Bushehr, a city in south west of Iran, and analyze the effects of these solutions in thermal comfort and energy consumption of these buildings in comparison to the modern ones. After selection of the sample buildings and short-term field measurements from local climate throughout the year, the field data collected was used in simulation and comparison of the traditional and the contemporary sample buildings. All buildings were simulated with Design Builder software under natural ventilation conditions as a passive solution in moderate periods of the year while split air-conditioning systems were used during hot and humid periods. The findings show that shading, proper materials in exterior walls and natural ventilation in traditional dwellings are the primary factors in improving comfort conditions and reducing cooling loads; and accordingly, discomfort hours decreased by 12 to 34 percent and the cooling energy consumption was also reduced by 26 to 46 percent in these dwellings. Better thermal comfort and less energy consumption in traditional dwellings of Bushehr show that the integrated climate-responsive solutions used in these dwellings have well-responded to the local climate characteristics in this city and have contributed to the formation of climate-responsive buildings in the severe climate conditions of this region. Today it is possible to reuse these buildings as residential spaces with satisfactory thermal comfort conditions and less energy

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