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Seismic and Geotechnical Study of Land Subsidence and Vulnerability of Rural Buildings

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ABSTRACT

In recent years, the land subsidence due to different phenomena such as excessive withdrawal of groundwater resources has lead to significant damages to farmlands, residential buildings, roads and transmission lines. Inattention to the land subsidence results in the ruining of buildings which in turn causes the migration of people and imposes financial and social costs on the government. In this paper a case study is performed for Marvdasht plain and rural regions of Fars province, Iran. All affecting parameters and their related damages are considered in the study. The variation of groundwater level and the conditions of rainfall and drought processes in recent years are investigated. The effects of faults and the seismic vulnerability of the regions are also studied by seismic methods. Such factor as groundwater level drop, thickness of clay layers, variation in the thickness of layers at the hillsides and the coincidence of the direction of created cracks and fissures with direction of available faults in the studied area have been investigated as the main factors affecting the soil settlement. At the end of the research, appropriate solutions for the land subsidence prevention and consequently the reduction of the related damages are presented.

KEYWORDS

Land Subsidence; Fault; Surface Cracks and Fissures; Iran; Withdrawal of Groundwater

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