



Natural and induced collapse and caprock dolines hazard, Karapınar, Turkey

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Abstract

The number collapse and caprock dolines (locally known as obruk) has increased rapidly in recent years in the near of Karapınar, located in the semi-arid Konya Basin in the Central Anatolia. 19 dolines formed in the last 32 years (1977-2009), as a result of the collapse of conduit roofs in the Neogene lacustrine limestone in the Obruk Plateau and Karapınar Plain. Of these, 13 formed within the past 4 years (2006-2009). The Obruk Plateau takes its name from the presence of several hundred palaeo-dolines which formed as a result of natural process during the Quaternary. More recently, human activity has also induced the formation of new dolines, which present a risk to life and property. Changing agricultural patterns have led to the opening of thousands of wells in recent years, and increased water pumping currently exceeds the sustainable yield of the aquifer. Accordingly, the formation of dolines has triggered due to a combination of natural and human effect. The groundwater level has falling almost 24 m in the vicinity of Karapınar during the last 30 years. Legally-binding precautions must be taken to prevent further water table decline, in order to prevent potential dolines formations within the basin in coming years.