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Risk assessment of sinkhole hazard in Turkey

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Approximately one third of Turkey's total area comprises karstic terrain (carbonate and gypsum karst), and this contains several hundred sinkholes. Some part of the karstic terrain is increasingly facing serious sinkhole hazards in the recent years. The location and timing of sinkholes cannot generally be predicted and they usually occur abruptly. But Quantitative sinkhole hazard assessments in karst terrain allow estimation of the potential sinkhole risk areas in future. The estimation is critical for environmental management, planning, human life and property in the karst terrains. Therefore, an assessment of sinkhole hazard at a national scale is very important for local decision makers and local people. This paper introduces the analysis and assessment of sinkhole hazard using GIS technique and remote sensing. Factors of the risk assessment include types and thickness of carbonate and evaporate rocks, geomorphologic and structural settings, hydrologic and hydrogeologic conditions, sinkhole densities, population densities, human activities, and land use. The sinkholes are mapped and the risk areas are estimated. The assessment result is divided into four levels: high risk, medium risk, low risk, and very low risk. The high risk areas are mainly located Obruk Plateau limestone karst terrain and its surrounding in Konya Closed Basin and some parts of the Sivas gypsum karst terrain.