

Flash Flood in Gabes City (Tunisia): Hazard Mapping and Vulnerability Assessment

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Abstract : Flash floods are among the most serious natural hazards that have disastrous environmental and human impacts. They are associated with exceptional rain events, characterized by short durations, very high intensities, rapid flows and small spatial extent. Flash floods happen very suddenly and are difficult to forecast. They generally cause damage to agricultural crops and property, infrastructures, and may even result in the loss of human lives. The city of Gabes (South-eastern Tunisia) has been exposed to numerous damaging floods because of its mild topography, clay soil, high urbanization rate and erratic rainfall distribution. The risks associated with this situation are expected to increase further in the future because of climate change, deemed responsible for the increase of the frequency and the severity of this natural hazard. Recently, exceptional events hit Gabes City causing death and major property losses. A major flooding event hit the region on June 2nd, 2014, causing human deaths and major material losses. It resulted in the stagnation of storm water in the numerous low zones of the study area, endangering thereby human health and causing disastrous environmental impacts. The characterization of flood risk in Gabes Watershed (South-eastern Tunisia) is considered an important step for flood management. Analytical Hierarchy Process (AHP) method coupled with Monte Carlo simulation and geographic information system were applied to delineate and characterize flood areas. A spatial database was developed based on geological map, digital elevation model, land use, and rainfall data in order to evaluate the different factors susceptible to affect flood analysis. Results obtained were validated by remote sensing data for the zones that showed very high flood hazard during the extreme rainfall event of June 2014 that hit the study basin. Moreover, a survey was conducted from different areas of the city in order to understand and explore the different causes of this disaster, its extent and its consequences.

Keywords : analytical hierarchy process, flash floods, Gabes, remote sensing, Tunisia

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