Title: Development of an early warning system for flash floods in Wadi Watier – Sinai desert

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ABSTRACT

Flash floods can cause important economic damages in arid areas and even the loss of lives. The PhD research contributed to the development and implementation of an innovative early warning system for flash floods in Wadi Watier in the South Sinai desert (Egypt): the Flash Flood Manager (FlaFloM). FlaFloM aims to protect the city of Nuweiba from the flash-flood hazards and contributes to the wise use of floodwater.

An intensive hydrological analysis have been carried out using hydrometeorologic ground station data and satellite data for the study area, followed by the development of a custom-built rainfall-runoff hydrologic model to reflect the arid conditions of the study area using limited observation data. The research also includes a sensitivity and uncertainty analysis for the developed tools and the data used. The research work this contributed to the better understanding of the behaviour of flash floods in arid and semi-arid regions.

The FlaFloM system has been in operation since December 2009. It is used by the Crisis and Disaster Management Centre of the South Sinai governorate. The system resulted in extra time to spread warnings and take action for the competent authorities. As such, the system succeeded in providing a flood warning two days in advance in January 2010 and protected the city of Nuweiba.