



## The etiology of increasing flood losses in Africa: climate and population patterns

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The number of flood deaths in Africa has gone from fewer than 2,000 in 1950-1969 to more than 15,000 between 1990 and 2009. In addition, the number of lives affected and the amount of economic damage associated to these events have dramatically increased. What hides behind this trend? Is it a reflection of climatically-driven increases of the intensity of precipitation and magnitude of floods? Is it that there are more people in Africa potentially affected by floods? Or are there socio-economic patterns at work that have amplified flood risks?

To understand the reasons why flood risk has increased so dramatically in Africa, we investigated trends in annual maximum discharge using a large, consistent and quality-assured database from 79 gauging stations in Africa. This database provides a unique opportunity to analyze the changes in the frequency of hydro-meteorological extremes in the last decades. Also, given that African river basins remain largely undisturbed and are representative of diverse hydro-climatic conditions, changes in hydrological response of the African river basins may provide relevant information for detecting spatially and temporally averaged climatic conditions.

Furthermore, we also investigated the exposure to flood vulnerability. In fact, the African continent, as well as many other areas around the world, has undergone widespread and intensive urbanization. During the last 50 years, while the total population has increased by a factor of 4, the urban population in Africa has increased by one order of magnitude. The study of population dynamics at the continental scale showed that most of the recent deadly floods have happened where the population increases have been largest. At the local scale, we found numerous examples of increased human settlements in flood prone areas. The results of this study provide useful indications for planning appropriate and sustainable mitigation actions to counterattack the currently increasing flood risk.