EGU22-248, updated on 26 Sep 2022
https://doi.org/10.5194/egusphere-egu22-248
EGU General Assembly 2022

Multi return periods flood hazards and risks assessment in the Congo River Basin

Bola Bosongo Gode
University of Kinshasa, Centre de Recherche en Ressources en Eau du Basin du Congo, Hydrology, Congo, the Democratic Republic of the (gode.bola@gmail.com)

Gode Bola[1,4], Raphael M. Tshimanga[1], Jeff Neal[2], Laurence Hawker[2], Mark A. Trigg[3], Lukanda Mwamba[4], Paul Bates[2]

[1] *Congo Basin Water Resources Research Center (CRREBaC) & Department of Natural Resources Management, University of Kinshasa, DR Congo*

[2]*School of Geographical Sciences, University of Bristol, United Kingdom*

[3]*School of Civil Engineering, University of Leeds, United Kingdom*

[4]*General Commission of Atomic Energy, Regional Center for Nuclear Study, Kinshasa, DR Congo*

Flood disasters have always been reported in the Congo Basin with significant damages to human lives, food production systems and infrastructure. Losses incurred by these damages are huge and represent a major challenge for economic expansion in developing nations. In the Congo River Basin, where the availability of in-situ data is a significant challenge, new approaches are needed to investigate flood risks and enable effective management strategies. This study uses recently developed global flood prediction data in order to produce flood risk maps for the Congo River Basin, where flood information currently does not exist. Flood hazard maps that estimate fluvial flooding at a grid cell resolution of 3 arc-seconds (~ 90 m), gridded population density data of 1 arc-second (~ 30 m) spatial resolution, and a spatial layer of infrastructure dataset are used to address flood risk at the scale of the Congo Basin. The global flood data provide different return periods of exposure to flooding in the Congo Basin and identifies flood extents. The risk analysis results are presented in terms of the percentage of population and infrastructure at flood risk for six return periods (5, 10, 20, 50, 75 and 100 years). Of the 525 administrative territories, 374 are exposed to fluvial floods, and 38 (10 %) of them are categorised as risk hotspots. Analysis shows that the most exposed territories represent 1% of total exposure which is estimated at 2.65% of the basin's population. This study demonstrates the first and potentially most important stage in developing flood responses by determining the flood hazards areas and the population/infrastructures that would be exposed. The flood risk maps produced in this study provide information necessary to support policy decisions of flood disasters prevention, including prioritisation of interventions to

reduce flood risk in the CRB.

Keywords: Flood hazard, Risk assessment, Return period, Congo River Basin