

## **Hydrological modelling and possible climate change impacts in a wetland system: the case of the Okavango Delta, Botswana**

**B. F. ALEMAW**

*Department of Geology, University of Botswana, PO Box UB 00704, Gaborone, Botswana*  
[alemaw@mopipi.ub.bw](mailto:alemaw@mopipi.ub.bw); [bfalemaw@gmail.com](mailto:bfalemaw@gmail.com)

**Abstract** An attempt has been made to model the flooding patterns of the Okavango Delta, Botswana, with the objective of reproducing the historical flooding patterns as well as water resources situation, and then to study the impact of possible regional climate change on the flooding patterns and/or size of the delta. The study employed a spatially-distributed surface water-groundwater interaction model which was calibrated for the current climate and then coupled with global climate model (GCM)-based climate change scenarios. The HadCM2 and UKTR simulated changes in the 2050s in relation to the baseline climate, and resulted in reductions in precipitation of 5.6 and 2%, and increases in temperature of 2.5 and 1.7°C, respectively. The simulated average annual recharge of the delta for the baseline period (1961–1990) was found to be 6.3 mm/year, which is 12% of the mean annual rainfall of 485 mm, and also comparable with regional recharge values. The 2050s GCM simulations with HadCM2 and UKTR scenarios were found to result in recharge values of 6.2 and 5.8 mm/year, respectively.

**Key words** climate change impact; flooding pattern; Okavango Delta; wetland; GCM