Geophysical Research Abstracts,
Vol. 10, EGU2008-A-01324, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-01324
EGU General Assembly 2008
© Author(s) 2008

Long-term balance between domestic water demand and groundwater recharge of the crystalline basement aquifers in the Northern Volta river basin, West Africa

J.P. Sandwidi (1), N. van de Giesen(2), J.J. Bogardi (3) and P.L.G. Vlek(4)

(1) INERA, Ouagadougou, Burkina Faso, (2) TU Delft, Delft University of Technology, Delft, The Netherlands, (3) UNU-EHS, United Nations University, Bonn, Germany, (4) ZEF, University of Bonn, Bonn, Germany jpsandw@hotmail.com / Phone: +226 70261868

Abstract

Groundwater is the main source of household water for the rural population of the sahelian and savanna zones of the Volta river basin in West Africa. Groundwater supplies more than 90% of the population in Burkina Faso and more than 80% of the urban population in the northern part of Ghana. Groundwater is mainly found in, and extracted from crystalline rocks, which water storage capacity is mainly determined by their secondary porosity caused by fracturing and fissuring. The climate is characterized by a monomodal rainfall regime with three to five months of rain, combined with a high evaporation rate of about 80% of the annual rainfall. Groundwater studies in the Kompienga dam basin of Burkina Faso in the Center East of the Volta river basin showed that annual replenishment represents merely 5% of the annual rainfall in 2005. The water used by the population amounts to two percent of this annual groundwater recharge. The question is the groundwater supply will remain adequate in the long term when domestic water demand is likely to increase and aquifer recharge may decrease due to forecasted changing climatic conditions? This presentation evaluates aquifer recharge in the basin according to predicted climatic conditions and compares this to estimates of increasing domestic water demand caused by a growing population.

Keywords:

Domestic water demand, crystalline basement aquifers, groundwater recharge, long-term balance, Northern Volta river basin, West Africa