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Relationship between Climate and Groundwater Recharge in the Besseke Watershed (Douala – Cameroon)

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ABSTRACT

In Douala, economic capital of Cameroon, annual rainfall and temperature from its meteorological station (latitude: 4°00'N; longitude: 9°43'E; elevation: 5.0 m) were obtained and analysed to investigate the impact of climate variability on groundwater recharge. The climate shows a strong evidence of changes towards persistent weather conditions. The region is mainly characterized by a mean inter-annual temperature of 27.4°C and influenced by the mount Cameroon (4095 m in elevation). A recent decrease in mean annual rainfall occurred since 1982. The average annual rainfall which was 4200 mm with about 220 days of rainfall from 1917 to 1937 has moved to 4049 mm for the period 1937-1957, to 3826 mm for the period 1968-1988 and to 3619 mm for the period 1971-2001. Between, 1997 and 2007, the total number of days of rainfall has not exceeded 220 (193 days of rainfall in 1998 and 216 days of rainfall in 1999). By using Gauss law on 31 years (1971-2001) of annual rainfall, one note that the value 2850 mm has 20% of luck to be not observed and the value 4219 mm has 20% of luck to be exceeded. Douala already suffers from water shortage not because of decrease of rainfall but due to quality of underground water and salty taste of the main river caught for water supply. Moreover, precipitation is considered as the main replenishment source of all water resources in the study area (watershed of Besseke). The calculated interannual groundwater recharge rate (potential recharge, not necessarily real) is about 9% compared to the interannual total precipitation received by this area located closer the Atlantic Ocean (Gulf of Guinea). Groundwater discharge from the aquifer occurs between November and March.

KEYWORDS

Cameroon (Douala, Besseke), Climate Variability, Impact, Water Balance, Recharge

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