

Climatic Changes Observed in Boké Prefecture Since 1981: Study of Variations in Temperature, Relative Humidity, Precipitation and River Flow Rates

Moriba Kourouma^{*}, Mory Kourouma, Oumar Soumare

Institut Supérieur des Mines et Géologie de Boké, Guinea

^{*}Corresponding Author

ABSTRACT

Guinea is characterized by a mining potential whose richness in its subsoil in bauxite is estimated at 40 billion tons with 23 billion tons located in the Boké region (BSD, 2018). The bauxite deposits in this northwestern part of Guinea offer favorable deposit and operating conditions (stripping ratio less than unity, Al_2O_3 content $\geq 65\%$, SiO_2 content $\leq 1, 5\%$; $\text{Fe}_2\text{O}_3 \leq 4$; overburden < 25 cm) - CBG, 2022. The natural conditions of the bauxite deposits have aroused the interest of many multinational companies whose beginnings of operation go back a long time in the Boké region. Among the multinational companies we cite, the CBG (1963), the GAC (2004; 2013), the RUSSAL-COBAD (1975; 2014); SMB (2015). Annual crude ore production for CBG amounts to 18 million tonnes in (2021), SMB produces 36 million tonnes (2018). The mining activities that take place during the development of these resources cause disturbing changes in the hydrological and climatic regimes to the environment. This work that we are doing is situated in the second period of paroxysm of drought that West Africa has known and whose repercussions are felt in Boké. It is on the basis of a study, an analysis and an evaluation of the climatic variations, of the decades 1980, relating to the parameters of temperature, precipitations, relative humidity, flow of the river that we want to demonstrate the sensitivities of groundwater resource parameters in this northwestern part of Guinea. According to the results of the studies, the prefecture of Boké is experiencing flooding phenomena which in 2004 cause significant damage, global warming during all seasons (dry and rainy), the drastic drop in the level of the Tinguilinta River to the point of posing enormous difficulties of access to drinking water for industrialists and the population. To highlight climate change in the Boké area, it is established that in 1973 rainfall was down. The years 1998 and 2005 were remarkably hot. The rainfall deficit between 1961-1990 and 1981-2010 is estimated at 7.4%. The migration of isohyets towards the south is a reality and evolves from 2000 to 1400 mm. The annual, interannual and seasonal variability to which the climatic and hydrological parameters (temperature, precipitation, humidity, flows) are subject influence the hydrological balance.

Keywords: Boké, climate variation, Drought, Water balance, Guinea, global warming

