



## **Rainfall and Hydrological Instability Analysis Using Standardized Index on Oueme River Lower Basin in Benin (West Africa)**

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On the Oueme River lower basin within subequatorial climate zone in Benin, rains and flow are the primary sources of freshwater for domestic, fishery and agricultural purposes. But water availability depends on climate rhythm. This study aims to analyse hydroclimatic instability at monthly scale through the standardized index of rain and flow data in the Oueme River lower basin. Study data are precipitations of Bonou station and flow of Dome and Bonou sub basins over the period 1961-2010. Statistical methods of standardized rainfall and flow index, calculation of annual rainfall and flow variation rate and graphical representation help to highlight change on rains and flow regimes (very dry, dry, normal, wet and very wet). The study shows that lower basin of Oueme River experiences very dry, dry, normal, wet and very wet hydroclimatic conditions according to the years and various standardized index ranges. Indeed, annual total rainfall varies between -39.7% (very dry regime) and +59.4% (very wet regime) compared to normal climate context. Rainfall instability affects surface water availability by way of flow variation from -91.8% to +119.4% on the extreme hydrological regime leading to water scarcity (drought) or so more water (flood). This complicate fishery, crop production and related socio-economic activities on the Oueme River lower basin in Benin. This statistical approach of hydroclimatic instability analysis could help to elaborate sustainable water management tools in the West African River basin vulnerable to global change.

Keys words: Standardized index, hydroclimatic variability, water availability, Oueme River, Benin.