Hydro – Climatic Variability of the Hadejia – Jamare River Systems in the North Central Nigeria

By

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The study investigates the hydro-climatic variability and land use dynamics of the Hadejia Jamare basin in the north central Nigeria. It examines the attributed problems that inhibit sustainable agricultural developments in the basin. Trend analysis was adopted in identifying the flow pattern while Thornthwaite empirical model was used to determine the potential evapo-transpiration (PE) loss taken into cognisant the land use dynamics obtained from change detection using Landsat TM of 80s and 2006. The estimated PE index was used to compute the water balance for land surface fluxes. Using the results obtained from trend analysis and land use dynamics, multiplying factors were determined and future land surface fluxes computed for high and medium climate change (HCC; MCC) scenarios for 50 and 100 years. The results reveal that evaporation loss will increase at about 5% and 7% for 50 and 100 years HCC scenario due to increase in temperature and decrease in vegetal cover which currently is reducing at an average rate of $0.675 \times 10^6$ ha per annum. The flow regime is characterised by high level of variability and uncertainty (attributed to both natural and anthropogenic factors) with an increasing dry years. For sustainable year round agriculture developments of the region in the face of changing climate, a regulated release of water to ensure year round flow that is desirable for farmers, pastoralists and fishermen especially in the dry season is recommended.