

**Rainfall variability over West Africa from global and regional
models from seasonal to decadal timescales
with multi-model approaches**

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West African future climate constitutes a general concern because of the fact that population depends largely on agriculture and water resources. Therefore it is really necessary to have some realistical climate change predictions therefore the multi-model ensemble approach seems to be the most reliable way.

This work aims to assess CMIP5 simulations in terms of its ability to reproduce West African climate variability from seasonal to decadal timescale for the past-present (1861-2005) and futur (2006-2100) day with multi-model and multi-scenario approaches under RCPs scenario. Those simulations are analyzed along with output from five CORDEX RCMs models. The results show that the different GCMs models as well as the model ensemble point out some biases in simulating present day. Meanwhile the systematic errors are less important in the model ensemble based. Some little divergences of models agreement are noticed in simulating the precipitation with increasing greenhouse gases. However the GCMs models show a consistent negative trend in the seasonal precipitation from 2030s decade to 2080s for the West Africa. However the regional climate model can realisticaly simulate the monsoon rainfall over West Africa. The RCM's ensemble mean reproduces the diferent steps of the monsoon with a rainfall maximun over the Gulf of Guinea between May and july, the onset of Sahelian zone in July when rainfall maxima shift northward of 10N until September and a secondary coastal rainfall maximum in October.