

Modelling the impacts of reforestation on future climate in West AfricaBabatunde Abiodun[†];[†] University of Cape Town, South AfricaLeading author: babiodun@csag.uct.ac.za

This study investigates how reforestation in West Africa might alter the future climate over the region. The study analyzed series of multi-decadal simulations of past (1981-2000) and future (2031-2050) climate from a regional climate model (RegCM3), forced by results of global climate model (EHAM50). The future climate simulations used the IPCC A1B climate forcing. In the study, we evaluate the capability of the models in simulating the West African climate, project the future climate over West Africa, and then investigate how seven different reforestation patterns could alter the regional climate projection. Three of the reforestation scenarios used zonal reforestation over West Africa, while four used random reforestation over Nigeria. The results of study show that reforestation in West Africa could have both positive and negative impacts on the future climate over the region, depending on the location of the reforestation. The reforestation lower temperature and increase rainfall over the reforested area, but also slows down the northward progression of the monsoon system over the area. As a result, it increases temperature and reduce rainfall north and northeast of the reforestation area. Hence, the study suggests that reforestation in West Africa requires a mutual agreement among the West African nations, because the impacts of reforestation not limited to the reforestation area. The countries located north and northeast of the reforestation could experience a warmer and drier climate than without the reforestation.