

Climate change impacts on crop yield in Koutiala, Mali

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An integrated modelling framework is used to simulate crop productivity for current and future climate scenarios. Two crop models, Decision Support Systems for Agro-Technological Transfer (DSSAT) and the Agricultural Productions Systems sIMulator (APSIM), were calibrated and evaluated for the study site in Koutiala, Mali, simulating yields of maize, millet, and peanut for 123 households. These crop models are fed by weather data from baseline climate (1980-2009) from observed weather and future climate (2040-2069) from 5 Global Circulation Models (GCMs) were used as inputs to crop models. The models' results differ according to the crop considered. For maize, there is a decrease of grain yield across all GCMs and crop models. For sorghum, there is a slight decrease across GCMs with DSSAT, but the grain yield remains constant on average with APSIM. For peanut and millet, the results are more optimistic and grain yield increases across all cases. These outputs will then be linked to the economical the Trade-Off Analysis-Minimum Data model (TOA-MD) to assess impacts on farmer livelihoods. Further, adaptation strategies (e.g. drought and heat tolerant cultivars) will be simulated to assess their potential impact for the future.