
Climate change and agricultural output in the ECOWAS region

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Abstract: This study examined the impact of climate change on the output of the agricultural sector in Economic Community of West African States (ECOWAS) using 2002–2015 annual panel climatic dataset under the framework of a cross-country agricultural production model. The study accounted for climate change using variations in rainfall and temperature, while model estimation was based on both fixed effect and panel two-stage least-squares techniques. The results indicate that while variations in rainfall exert positive and significant influence on agricultural output in ECOWAS, the influence of temperature variations is negative and insignificant. Other non-negligible output drivers in the agricultural sector in the sub-region are capital and labour. The study concludes that the adoption of agricultural techniques that optimise water use through increased and improved irrigation systems will enhance the output of the sector in ECOWAS.

Keywords: climate change; agricultural output; panel-data model; ECOWAS.

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1 Introduction

Agriculture is one of the key components of the productive sector in the Economic Community of West African States (ECOWAS) region. Its contributions to domestic production, employment and foreign exchange earnings in the region cannot be overstressed. Indeed, it has been aptly described as the bedrock of most ECOWAS member states, contributing around 40% to their gross domestic product (GDP), employing more than half of their total labour force and providing the main source of livelihood for their poor people (Chijioke et al., 2011). Agriculture in the region is mostly rain-fed, which exposes agricultural production to high levels of seasonal variability in rainfall (Ayinde et al., 2011). In the case of Nigeria, for instance, the extant literature documents that agriculture is the main source of food and employer of labour, employing about 60% to 70% of the labour force. It is an important sector of the economy which provides raw materials for the processing industries and also earns foreign exchange for the overall economy (Mohammed-Lawal and Atte, 2006).

However, in spite of its economic importance, agriculture in the developing world has been widely acknowledged as one of the sectors extremely vulnerable to climate change,