

Assessing the Impact of Climate Change on Food Security in Ghana

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Abstract

Statement of the Problem: Globally, various climatic studies have estimated a reduction of crop yields due to changes in surface temperature and precipitation especially for the developing countries which is heavily dependent on agriculture and lacks resources to counter the negative effects of climate change (A.KikoyoJoelNobert, 2016). Agriculture is the most climate-dependent area of human life in most of sub-Saharan Africa as well as many developing countries in the world(Hanaan Dinko, 2017). It is expected that by 2050, the world's population will have increased by one-third, with the highest increase occurring in developing countries(IAEA, 2020), the population increase would surely drives higher demand for food. According to (IAEA, 2020), Climate change is a serious threat to global food security, sustainable development and poverty eradication. The blend of a warming Earth and growing human population would likely strain the world's food systems.

In Ghana agriculture plays a vital role in the socio-economic development of the district and the region at large, it contributes 10 percent to the national revenue. Food availability decline is an attribute of environmental and climatic tribulation like rainfall, atmospheric temperature, population and fluctuation in food price (Weldearegay & Tedla, 2018).

Methodology & Theoretical Orientation:

Historical yearly weather data, including total rainfall, average atmospheric temperatures for seventeen years period (2000-2017) were acquired from the Ghana Meteorological authorities in the three catchments districts were selected. To observe interaction between temperature and crop yields per hector, the catchment temperature data were based on average daily temperature recoding from the weather stations positioned at the catchment districts.

Crop cultivation statistics (harvested area, production and yield) of maize and cassava were acquired from the Ghana Statistical Office of the Ghana Ministry of Food and Agricultural (MoFA).

Statistical significance was defined on the 0.001, 0.01, 0.05 and 0.1 level of significance (Nasher & Uddin, 2015). This type of test are mostly done in field of environmental science

because of its simplicity and it has a cope for missing values and values below a detection limit (Libiseller, 2004). To investigate the correlations between climate variables and crop yields on a yearly basis, daily values temperatures and rainfall were converted to yearly values. Annual or yearly values from the crop's yields were also calculated. According to the investigated correlation between crop yield variables and climatic (rainfall and temperature) variables, influences of non-climatic factors such as improvements in crop genetics and technical factors are omitted. Furthermore, climatic influences are better detected.

Findings:

For all the three (3) catchment areas of the study; they is an indication that, rainfall has a significant impact on crop yield.

Cassava shows very strong adoptability to change in temperature and rainfall.

Conclusion & Significance:

The study concludes that, in Kwahu South district average temperature has a statistically significant relationship on crop yield (maize yield). Also, in Offinso North district, there is an indication that average temperature, average rainfall and area per hectare has a statistically significant relationship on crop yield (cassava yield). We also found that in Twifo Praso district area per hectare has a statistically significant relationship on crop yield (cassava yield).



Recent Publications

- 1 A.KikoyoJoelNobert, D. (2016). No TitleAssessment



of impact of climate change and adaptation strategies on maize production in Uganda. Elsevier ScienceDirect (SD), 93, 37–45.

2 Agricultural, G. M. of food and. (2019). No Title Twifo/Herman/Lower/Denkyira. Geraadpleegd 27 augustus 2019,

3 Antwi-Agyei, P., Fraser, E. D. G., Dougill, A. J., Stringer, L. C., & Simelton, E. (2012). Mapping the vulnerability of crop 44

4 production to drought in Ghana using rainfall, yield and socioeconomic data. Applied Geography, 32(2), 324–334.

5. Weldearegay, S. K., & Tedla, D. G. (2018). Impact of climate variability on household food availability in Tigray, Ethiopia. Agriculture and Food Security, 7(1), 1–9.

Biography:

Wisdom Osabutey is Ghanaian born researcher. He has published a lot of climate change related articles in top class journals like INTERNATIONAL JOURNAL OF SCIENCE AND RESEARCH (IJSR). He has been nominated to be a speaker at the 5th Global Food Security, Food Safety and Sustainability at Vancouver, Canada.

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