Available online at www.asric.org

ASRIC Journal on Water, Energy and Environment 1 (2020) 68-81

Performance Evaluation of Small Scale Irrigation Schemes By Using Process and Comparative Indicators: Case Study on Golina and Kokono Small Scale Irrigation Schemes, North Wollo Zone, Amhara Region, Ethiopia

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Received 31 October 2019; revised 3 August 2020; accepted 6 November 2020

Abstract

Meteorological factors that mostly influence food production of any Nation are rainfall and temperature. Their extremes are significant and observable indices of evidences of negative climate change scenarios and adequate knowledge of extreme events will help in policy making to save the nation of future losses due to their extremes. With the advent of climate change, rainfall and temperature patterns are potential threats to achieving the SDG's of zero hunger and poverty eradication, coupled with the ever growing world population and development.

This paper x-rays rainfall and temperature regimes of Northern Nigeria over a 47 years period and its trend within 13 states as it has affected farming activities and caused massive migration of herders to more favourable and conducive areas that usually lead to incessant herder- farmer's crisis in Nigeria.

Keywords: Climate change extreme events, Rainfall and temperature.

1. Introduction

Climate change impact on flora is receiving increasing attention around the world (Fuhrer, 2003). Climate change projections may result in reductions of average annual discharge (productivity) of up to 50%, which poses a great challenge to the whole socio-economic model that is based largely on water demanding activities: recreation, tourism and food production (Iglesias and Garrote, 2015). Rainfall and temperature are two very important climatic variables that determine the nature of any environment whether for crop production or human habitation and these are the defining variables for classifying any area as either temperate or tropical. They are also the two most important climatic variables directly affecting the growth and yield of plant and crop for both man and animal consumption and their high variability is a great threat to food security of any nation and the world in general.

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Heat waves or extreme temperature events are projected to become more intense, more frequent, and last longer than what has been currently observed in recent years (Meehl *et al*., 2007) While temperature showed a whopping 0.8, 0.7, 0.6, 0.5, and 0.3 increasing difference for Adamawa, Taraba-Borno-Kano-Katsina-Sokoto, Yobe-Zamfara, Bauchi-Kaduna-Kebbi-Niger and Plateau state respectively agreeing totally with (IPCC, 2007 and Meehl *et al.*, 2007) projections. Rainfall in with its unpredicted nature which is determined by a lot of factors had been increased in the last decade in most states of Northern Nigeria as seen in figures 4 to figure 16. Its spatial variability can also be seen in figure 17.

5. Conclusion

As seen from the results while rainfall amount was highly variable and unpredictable in Northern Nigeria from one location to another (figure. 17), maximum temperatures kept rising on a gradual note yet crop and plant requirements for optimum growth and yield remain constant. This had contributed to the incessant records of failure in food production and optimum crop yields over the years which remained the highest threat to food security in the world and Nigeria in particular.

Adequate knowledge of rainfall and temperature patterns is required for the fight against the imminent creeping danger of food insecurity since they are the basic climatic variable that will militate against the attainment of the SDGs if not given adequate consideration.

6. Acknowledgement

The author wishes to thank the organizers of the African Union Scientific Technical Research Commission for organisation of this conference that gave African Scientists an opportunity to meet at continental level. Also Prof. E. E. Oku is highly appreciated for his various advices to this author in relation to the conference and finally all gratitude goes to God Almighty for the Capital Grace He granted me amidst all schedules to find time to put this work together.

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