

## Chapter 30

# Issues of Climate Change, Impact, and Adaptation Strategies in Nigeria

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### ABSTRACT

*Climate change is a global problem affecting agricultural production, a good adaptation strategy for this phenomena should be sought for increase agricultural production. The study was conducted in Nigeria to assess the Impact of Climate Change on root and tuber crops production among farmers in Nigeria. Secondary data were used for the study, they were collected from NRCRI Umudike and other individual publications. The result shows that climate change had negative impact on root and tubers crops production including potato. Adaptation of Agriculture to climate change in the areas of crop and animal production, post harvest activities and capacity building, divers friction of livelihood sources through the use of different farming methods and improved agricultural practices will help to reduce the impact of climate change. Examples are establishment of forestry, generation of improved and disease resistance crop varieties addition of value into agricultural products and post harvest activities for climate change adaptation and sustainable development.*

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## **INTRODUCTION**

Climate commonly refers to the average weather conditions of a particular place/location/country/region of the world over a long period of time, usually thirty years or more with regard to climatic elements such as temperature, rainfall, air pressure, etc.(Obioha, 2002) while climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests)by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer (IPCC, 2014). In other words climate change means any systematic change in the long-term statistics of these climatic elements sustained over several decades or longer. Climate Change may result from factors such as changes in orbital elements (eccentricity, obliquity of the ecliptic, precession of equinoxes), natural internal processes of the climate system or anthropogenic forcing (for example, increasing concentration of carbon dioxide and other greenhouse gases) (Agbola & Ijeleye., 2007).

Gaseous emissions from human activities are substantially increasing the concentrations of atmospheric greenhouse gases like Carbon Dioxide, Methane, Chlorofluorocarbon and Nitrous Oxide and this global warming has significant impacts on agriculture through the interaction of these elements (Wikipedia, 2016). The earth's average surface temperature has increased by 1 degree Fahrenheit just over the last century as a result of greenhouse emissions (Fischer et al, 2002). However, the rising concentrations of greenhouse gases (GHGs) in the earth's atmosphere, resulting from both economic and demographic growth since the industrial revolution are overriding the equilibrium for natural variability, leading to potentially irreversible climate change making GHG's accounting for about 55% in the intensity of the greenhouse effect. Since the industrial revolution mid-1700s activities that increased the concentration of CO<sub>2</sub> in the atmosphere increased in scale and distribution. Natural ecosystems like forests & wetlands permanently hold up to 20 to 100 times more of CO<sub>2</sub> /unit area for very long periods (carbon sink) because agricultural crops are harvested and carbon released back into the atmosphere. Anaerobic conditions in paddy rice flooding, grazing animals and termites release Methane (CH<sub>4</sub>) to the environment as a result of herbaceous digestion. Also, gaseous emissions from human activities such as burning of fossil fuels, coal mines, gas and oil drilling through production, bush clearing including deforestation and animal rearing, result into emissions of GHG.

## **ANNUAL GREENHOUSE GAS EMISSIONS BY SECTORS**

Annual GHG emission by sectors is shown in Figure 1 (Wikipedia, 2016). Power stations (21.3%) and Industrial processes (16.8%) were the highest culprits while waste disposal and treatment was the least.

In the long run, as gleaned from various reports (Heagle et al. 1983; Ludlow & Smit, 1987; Smit et al 1988) climate change could affect crop production in three main ways

- Effect on crop yield by alteration of the crop's immediate growing environments.
- Effect on area and location of lands suitable for agricultural production.
- Effect on multiple agricultural activities and on the functioning of the agriculture food sector, including prices, trade pattern, and employment.

Climate Variability depicted in Figure 2 is any deviation in the long-term statistics of climate elements over a short period of time: diurnal, seasonal, year-to-year and decade-to-decade differences in

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