

ASSESSMENT OF TREND AND EFFECT OF CLIMATE CHANGE ON OUTPUT OF PALM OIL IN NIGERIA (1975–2018)

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ABSTRACT

The broad objective of this study was to analyze the impact of climatic change on palm oil output in Nigeria (1975–2018) and identify the trend and factors that influenced output performance of palm oil. The study covered 1975–2018 periods. Secondary data were used for the study. The data were analyzed by the use of econometric methods. Findings showed that climatic parameters of rainfall, temperature, radiation, relative humidity, and sunshine exhibited significant positive trends during the 1975–2018 periods; while palm oil output exhibited a significant negative trend during the 1975–2018 periods. Palm oil output had a compound rate of growth of -1.67% per annum; while the climatic parameters of temperature, rainfall, radiation, sunshine, and relative humidity had a compound rate of growth of 0.1%, 0.7%, 0.9%, 1.5%, and 0.8% per annum, respectively. Palm oil output decelerated in growth; rainfall, sunshine, radiation, and relative humidity accelerated in growth; while, temperature stagnated in growth during the period under study. There were no significant differences in the average rate of growth of palm oil and each pair of the selected climatic parameters considered. In the long run, palm oil output was influenced by current values of area harvested of palm oil, rainfall, temperature, sunshine, and time variable; while, in the short run, palm oil output was influenced by 1 year lag values of area harvested of oil palm, palm oil output, rainfall, sunshine, and temperature based on the specified model. There was a fast adjustment to long run equilibrium among the short run independent variables that estimated the response of palm oil output to climatic change. The conclusion of this study is that climatic change affected the production of palm oil in Nigeria within the periods under study. It is, therefore, recommended that farmers should be educated by government and other stake holders in Nigerian agriculture on possible strategies for mitigating the impact of climate change on cash crop production as well as supported financially to cope with the impact of climatic change.

Keywords: climate change, nigeria, palm oil

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INTRODUCTION

The discovery and exploitation of petroleum in Nigeria, the black gold led to the decline in the importance attached the major cash crop such as palm oil, nevertheless, palm oil a major export crop (Adegeye and Dittoh, 1985). Global food production and global food security are not directly linked, although there are more than 160 million people in Nigeria and 70% of these population engage in agricultural production which includes palm oil, only few percentage of these population enjoy perfect dividends from such cash crop product, others are in losses due to influence of adverse climatic condition.

Apart from providing foreign exchange to the exporting countries, palm oil is a means of conserving foreign exchange. This is achieved by producing palm oil based on products such as palm oil butter, palm oil soap, and so on locally instead of importing (Oyekale *et al.*, 2009).

In recent years, Nigeria population has been deduced to increase at an increasing rate, but the country has lost her leading role in exportation of palm oil, this was due to downward trend in palm oil production (Adegeye and Dittoh, 1985). The rural population most at risk from anticipated climate change impacts is those subsisting in arid and semi-arid zones of Nigeria who have few options for adapting to yet more water scarcity other than migration. Of all the climatic factors, the daily and inter-annual variation in precipitation and temperature regimes are most crucial for rain-fed, run-off, transpiration in the production of cash crop (IPCC, 2007).

The palm oil has been identified as a unique export agricultural product in Nigeria starting from the late 19th century (Oyekale *et al.*, 2009). Palm oil (*Elaeis guineensis*) is considered an indigenous crop of West Africa in Nigeria, where it is found mainly in areas

of secondary forest throughout South Nigeria and in parts of the derived savanna.

In Nigeria, it believes that the natural habitat of palm oil are sources and banks of water courses, most valleys, especially in the forest/savanna transition zones, banks of lakes, and swamps. As the palm oil does not appear to survive in primary forest, it must have spread from these natural habitats to man-made temporary and permanent clearings in the rain forest. The oil palms in secondary rain forest are found mainly in West Nigeria and Delta State, around Benin, oil palm occur at densities of 69 per hectare, but such densities are more likely to be attained in the southern parts of West Nigeria with the possibility of some thinning out toward the north and the forest/savanna transitional zone, with the exception of Southwest Ondo and parts of Benin province. The area is considered rather dry for optimum oil yield.

Oil palm bush has been observed in parts of Asaba and Warri Division of Delta State and Kabba and Igala Divisions of 50–125 per hectare. In the Kabba and Igala examples located in derived savanna, oil palm bush occurs not only along the water courses but also in the more densely populated areas with at least 1270 mm of rainfall a year.

It is evident that climate change will have a strong impact on Nigeria, particularly in the areas of agriculture (Apata *et al.*, 2009). Nigeria like all the countries of sub-Saharan Africa is highly vulnerable to the impact of climate change (IPCC, 2007, and Apata *et al.*, 2009). The previous studies in Nigeria on the impact of climate change on food crops have primarily examined the impact of some specific cash crops using statistical modeling. Among these are the works by Enete (2010), Nwajiuba *et al.* (2010), Sowami *et al.* (2011), Ikhatua (2010), Eze *et al.* (2011), Ajewole and Lynda (2010), etc., for example, Nwadinobi (2011) in his work, using the Granger Causality approach, showed that there is

