

Artificial Intelligence and Agricultural Productivity Nexus in Nigeria: A Time-Series Analysis

Oluwaniyi Fayinminu

Osun state University, Osogbo, Nigeria

Abstract

This paper examined the relationship between Artificial Intelligence and Agricultural productivity in Nigeria. The study adopted annual time series data for the period 1990-2025. The Internet penetration rate was used as a proxy to assess the adoption of AI, while indicators of agricultural productivity were used to assess the performance of the sector. The data were obtained from the World Development Indicators (WDI), National Bureau of Statistics (NBS), Food and Agriculture Organization (FAO) and Central Bank (CBN). Descriptive statistics, trend analysis, unit root tests and regression techniques were used to evaluate the relationship between AI adoption and Agricultural productivity. The findings show that AI positively affects agricultural productivity through improving farm efficiency, resource management, reducing production losses and increasing crop productivity. The study also revealed that high implementation cost, poor infrastructure, poor internet connectivity and inadequate technical knowledge are the major barriers to the adoption of AI by farmers. The research concluded that the adoption of AI technologies can boost the speed of productivity and food security in Nigeria. Hence, there is a need to invest more in digital infrastructure, access to credit and government policies to speed up the adoption of AI driven technologies in agriculture sector.

Keywords: Artificial Intelligence, Agricultural Productivity, Food Security