

Chapter 19

Plausibility of Precision Agriculture as a COVID–19–Compliant Digital Technology for Food Security and Agricultural Productivity in Nigeria

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ABSTRACT

The chapter discusses the plausibility of precision agriculture (PA) as a COVID-19-compliant digital technology to tackle the challenges of food insecurity and low agricultural productivity in Nigeria. In all the countries where PA has been adopted, it includes a wide array of disruptive technologies such as global positioning system (GPS), satellite imagery, monitoring control systems (MCS) using an intelligent sensor, artificial plant growing technique (APGT), soilless cultivation system (SCS), drones/unmanned aerial vehicles (UAVs), artificial intelligence (AI), internet of things (IoT), robotics, variable rate technology, GPS-based soil sampling, and telematics. Adopting the PA in commercial agriculture will improve food production, increase food exports, gross domestic products (GDPs), and strengthen the actualization of sustainable food security. Ultimately, this chapter concludes with policy suggestions for mitigating the rising trends in food insecurity, food inflation, and low agricultural productivity.

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INTRODUCTION

The devastating effects of the COVID-19 pandemic on different segments of entrepreneurship including agribusiness have been well documented and reported all over the world by researchers and policymakers. What has not been well articulated is how to ensure food security while living with the first and second waves of the COVID-19 pandemic including coping with the protocols and guidelines being enforced by the governments to avert further infections and deaths. Reliable data from the Food Agriculture Organization (FAO), the World Health Organization (WHO), and other institutional agencies affirmed that the pandemic has serious adverse effects on agricultural practices and the food supply chain, a situation that portends great danger for food security for the growing vulnerable population across the globe (Siche, 2020). Particularly, the pandemic negatively affected the various segments of agribusiness especially livestock, agriculture, tourism, transport, education, health, fishing, mining, industry, commerce (Siche, 2020).

From a strategic point of view, the governments of developed and developing countries adopted a number of stringent measures ranging from complete or partial lockdowns, fiscal stimulus packages, and other economic intervention to mitigate the spread of the pandemic and sustain the business operations (Chibueze et al., 2020). With specific reference to agriculture, the pandemic led to a serious decrease in agricultural production and at the same time precipitating a rise in demand for food products due to panic-buying (Nicola et al., 2020). Besides, the supply and demand of agricultural products and extension services were affected because of the restrictions on the mobility of labour in the agricultural systems, difficulties in accessing animal feeds, social isolation, the ban on exports/imports, and social distancing, but the supply side of agriculture has marginally improved, while the demand for agricultural products has worsened for two key reasons, viz: (a) panic buying by people that stockpile food items thereby fueling a shortage of agricultural products, and (b) the pass ability restrictions that affect the accessibility of food by the consumers (FAO, 2020a, Siche, 2020; Zhang, 2020). Another report indicated that demand for agricultural products decreased largely because of a chain of factors - lingering uncertainty in the economy and reduction of people's purchasing power/spending capacity caused by reduced income and unplanned job losses (FAO, 2020b).

In Nigeria however, the pandemic affected the national economy leading to disruption of the daily operations, cash flow, sales, customer patronages, profits, turnover, and value chain of many businesses including agribusiness. The oil Gross Domestic Product (GDP) contracted by 6.63% compared to an increase of 5.06% and 5.15% in the 1st and 2nd quarters of 2019. Comparatively, the non-oil GDP contracted by 6.05% from an increase of 1.55% in the 1st quarter of 2020 and 1.64% in the 2nd quarter of 2019. Similarly, the rate of inflation rose to almost 13% (Olawoyin, 2020). To cushion the adverse effects of the pandemic, the Federal government announced a number of relief measures and palliatives for the citizens and MSMEs under its Economic Sustainability Plan. Some of the Innovative Government-Backed Relief Policy Measures include: N500 billion COVID-19 Crisis Intervention Fund, N50 billion CBN intervention fund, N20,000 conditional cash transfer to the vulnerable, tax relief, rescheduling of debt repayment, debt cancelation, reduction in the price of fertilizers for agribusinesses and temporary fuel price reduction among others (Chibueze et al., 2020). Apart from the Federal Government-Backed Policy Measures, the management of Facebook provided a grant of N500 million (\$1.3 million) to support 781 small businesses in Nigeria out of its \$100 million Global Grants Programme planned for 30,000 small and medium scale businesses (SMBs) in over 30 countries (Eleanya, 2020).

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