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COVID-19, Agriculture and Food Security in Ghana; The Way Forward

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ABSTRACT

Food production, its availability, and accessibility will continue to be key contributors to human existence. The world was hit by the COVID-19 pandemic in the year 2020 and its effect trickled into reduced production of goods and services in many industries across the globe. Understanding the effects of the pandemic in Ghana necessitated the writeup of this paper. The study took the form of a desk review where current studies across the globe on the effect of the pandemic on agriculture and food security were reviewed, after which it was supported by data from self-placed questionnaire administration. Across the globe, agricultural production experienced a reduction that phased into food insecurity. This was not limited only to the extremely affected countries, but also, in countries where COVID-19 infections were low. One key limiting factor that spiked the challenge in the agricultural sector was a reduction in the availability of labour for production. In many leading food-producing countries, the challenge became acute when perishable food crops began to get damaged. In Ghana, the virus similarly led to restrictions in movements in and between epicenters. It was reported by the Ghana Statistical Service that, 77.4% of Ghanaians were negatively affected by the increased prices in food sold in the country. Without immediate and effective management as well as policy interventions from the Ghanaian government, it is highly possible for most farmers and agricultural businesses to completely collapse. This communication is to highlight some ongoing and disturbing effects of the pandemic to policymakers as well as individual and governmental strategies that have been put in place to curb adverse

effects on food production. This will help enhance Ghanaians' standards of living amidst economic challenges.

Keywords: *COVID-19, Agriculture, Food Security, Ghana, Lockdown, Food Pricing.*

INTRODUCTION

The coronavirus was first reported in Wuhan-China, in December 2019 (Bello and Ben-Hamadou, 2021). The virus was declared a global pandemic by the World Health Organization (WHO) in March 2020 (Bello and Ben-Hamadou, 2021). Nations through the WHO took drastic measures to contain the virus' spread (Ibukun and Adebayo, 2021). These measures included lockdowns and restrictions of movements by people within and between most countries of the world (Ma *et al.*, 2020; Malaiarasan, 2020; Laborde *et al*., 2020). The consequence of this was depriving people of their livelihoods, out-doing culture, and most importantly labour shortage for food production (Bello and Ben-Hamadou, 2021).

Agriculture is the largest employer in most African countries, employing about 70% of the workforce (Thow *et al*., 2019). This sector being the backbone of human survival was largely hit by the pandemic (Bilali, 2020; Ceyclan and Ozkan, 2020; Muyiramye 2020; Rozaki, 2020; Wang & Huang, 2021). This rendered the world handicapped economically. The availability, accessibility, stability, and utilization of food have therefore become a major concern (Laborde *et al*., 2020).

According to Mardones *et al.* (2020), Food security contributes positively to United Nations Sustainable Development Goals 1 (No Poverty) and 2 (Zero Hunger). Amidst the pandemic, other environmental stresses such as climate change, and drought also expounded the reduced availability, accessibility, and affordability of food (Mardones *et al.*, 2020). Restrictions from the covid pandemic led to food hoarding and hikes in food prices (Bairagi *et al*., 2022).

In Ghana, the first case of COVID-19 was recorded on 12th March 2020 (Ministry of Health, 2020). This triggered fear across the stretch of the country leading to panic buying of foodstuff in the expectancy of lockdown (Asante and Mills, 2020). Eventually, lockdown came into force and resulted in a series of livelihood opportunities lost across the country (Abedi and Mills, 2020). Many authors have evaluated the impact of the COVID-19 pandemic on agriculture and food security across the globe but little information has been reported from specifically, Ghana (Bello and Ben-Hamadou, 2021). This paper aims to highlight the impact of the COVID-19 pandemic on agriculture and food security in Ghana as well as identify the adopted strategies of overcoming its impact through individual strategies and governmental policies.

MATERIALS AND METHODS

By use of Science-Direct and Research Gate, relevant literature (2020-2022) relating to the subject was reviewed and the findings, reported. Keywords and phrases used in search for literature include; COVID-19, COVID-19 and Food Security, COVID-19 impact on agriculture, COVID-19 and Agriculture, Agriculture and lockdown, COVID-19 pandemic and Food security, Corona Virus, and agriculture. The output was narrowed to Africa and Ghana. To

support findings with empirical data, a total of 68 respondents were engaged. Respondents were self-placed individuals who had access to mobile phones, tablets or laptops, good internet connectivity and were educated, such that they could read and understand questions in English by use of electronic data collection tools.

Data Analysis

Data was analyzed by use of descriptive statistics and Relative Importance Index (RII). 5-point Likert scale questions were analyzed through RII, where 1 was 'strongly disagree (SD)', 2 was 'disagree (D)', 3 was 'neutral (N)', 4 was 'agree (A)' and 5 was 'strongly agree (SA)'. Mean statistics of Likert scale questions were interpreted as strongly disagree if mean is between 1-1.80, disagree if between 1.81-2.60, neutral if between 2.61-3.40, agree if between 3.41-4.20 and strongly agree if 4.21-5.00. Results were then represented in tables and figures.

RESULTS

COVID-19 and Agriculture

The impact of the covid pandemic on agriculture is unlimited (Ceyclan and Ozkan, 2020; Pu & Zhong, 2020; Wang & Huang, 2021). Fears of food shortage became a concern by the second quarter of 2020 as food supply chains were affected (Lin and Xhang, 2020). Abroquah (2020), reported that, approximately 60-70% of the food that was given to needy families in Ghana were imported instead of local fresh food. Local food production has already been severely reduced in Ghana through excessive deforestation (Nimo *et al.*, 2021; Afele *et al.*, 2022) and illegal gold mining (Osman *et al.*, 2022). Generally, the effect of the COVID-19 on agriculture has to be considered in the scope of supply and demand dimensions (Ceyclan and Ozkan, 2020). Although movements were restricted across many countries, the production of food and other operations in the agricultural value chain could not be completely stopped (Bilali, 2020; Rozaki, 2020; Ceyclan and Ozkan, 2020). Crops, mostly perishables, were still exported though at lower rates and quantities (Lin and Xhang, 2020). The pandemic first largely impacted the Mediterranean countries in Europe (Ceyclan and Ozkan, 2020). These economies mainly rely on agriculture as they have the capacity to produce in large quantities for exportation (Lin and Xhang, 2020).

Harvesting and Post-harvest losses:

In Ghana, Agriculture remains the major employer (Mordor Intelligence, 2021). The production, consumption and export analysis reported by Mordor Intelligence (2021) on crops such as cereals, fruits and vegetables indicated that during the thick of the pandemic, there was a drastic reduction in their production coupled with the closure of hotels, bars, restaurants and other major local buyers in the country. Also, most consumers were restricted in purchase of the produce hence leading to post-harvest losses. This was not different in the reports of AFAP Partnership (2021), where it was reported that, COVID-19 has negatively affected food production, access to farm inputs and its distribution, agro-processing companies and access to markets as well as market pricings in Ghana. Per reports of the Hodey *et al*. (2020), Twenty-two million Ghanaians experienced a reduction in salary, this largely affected farmers as they could not properly finance the production of their goods for sale. The closure of conventional urban sales outlets resulted in consumers failing to make purchases as planned (FAO, 2020). The obstacles in outflow channels pushed sales pressure back to the production sectors, resulting in large amounts of unmarketable agricultural products (FAO, 2020).

COVID 19 and food security

According to FAO (2008), food security occurs when all people at all times have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. The four domains of food security as reported by Peng and Berry (2019), are availability, accessibility, utilization and stability of the food. The inability to get all these four domains as stated by Nour *et al*. (2020), is termed food insecurity. Food insecurity involves the limited availability to access adequate and appropriate food and other resources. The impact of the pandemic on food security was no different from other factors.

Accessibility:

Accessibility to food around the globe by people is one of the four domain that is greatly affected by the COVID-19 pandemic (Sabine and Etienne, 2020). A study by Reardon *et al.* (2020), confirmed this by stating that, disruptions in food supply due to lockdown caused limited access to food. Again, through loss of income and assets, COVID-19 threatened most individuals' ability to access food (Laborde *et al.*, 2020). This decline in income led to poverty and caused the inadequacy of resources needed to purchase food in most countries.

Utilization:

This domain mainly deals with the required nutrients needed by individuals to live. Food utilization was similarly affected by the COVID-19 pandemic globally (Laborde *et al.*, 2020). Through movement restrictions, good and hygienic food that is needed for proper growth was limited (Laborde *et al.*, 2020). Malnutrition which induces weak immune system has been generally exacerbate in extremely poor countries across the globe as a result of COVID-19 (Laborde *et al.*, 2020).

Availability:

The ruptures in the production and commercialization chains of agriculture in the local environment have led to the reduction in the availability of food in the world (Pereira and Oliveira, 2020). The close down of open markets and low-budget restaurants coupled with high transportation cost of agricultural products enhanced food unavailability. In reports of Inegbedion (2020), the COVID-19 pandemic lockdown has adversely affected availability of food to many countries in the world.

Stability:

The pandemic has caused swift fluctuations in the production trends of major food crops due to the lockdown and issues with labour availability. In most countries, farm production is directly proportional to the use of high labour (Inegbedion, 2020), but due to restrictions on movement, the work force for production was limited and led to the heavy changes in food production trends (Inegbedion, 2020).

GRFC (2021), reported that, roughly 155 million people were estimated to be acutely food insecure which represented an increase in 20 million people as compared to 2019 due to COVID-19 pandemic. According to Mukiibi (2020), African countries, especially the developing nations like Ghana are shifting their focus from the pandemic to the threats it poses on their daily supply of food. Many African countries are net importers of food (Mukiibi, 2020). In a country like Ghana, lockdown directives led to the supply of low-quality food (Mukiibi, 2020). Ayanlade and Redeny (2020), reported that restriction imposed on movement by most African countries coincided with the planting periods for many staple crops, which has resulted in high levels of food insecurity on the continent.

COVID 19, hunger, food pricing and marketing

The restrictions imposed by major food producers globally led to increase in food prices (Omer & Hassen, 2020; Khan *et al.*, 2021). Before COVID-19, food prices were generally stable though there had been some minor increases due to Climate Change and insects' infestations across Africa and South America (Mouloudj *et al.*, 2020). The pandemic aggravated the challenges of the already crippling industry in many developing countries (Khan *et al.*, 2020). Labour sourced from cheap countries in the production of food faced out and accumulatively increased food prices (Fawzi *et al.*, 2020; Malaiarasan 2020; Mardones *et al.*, 2020).

The price of food items spiked in major cities across Ghana getting to the end of March, 2020. These prices however have remained fairly stable through to the end of the year. The food inflation margin of the country increased by 5.3% between March and July 2020. It was reported that high prices of food affected close to 77.4% of Ghanaians in a study by the Ghana Statistical Service. The Government in response to food scarcity and high food prices in the country during three-weeks lockdown, made available to the poor and homeless one hot meal per day (Nunoo, 2020). According to reports of Nunoo (2020) for the British Broadcasting Corporation, the Ghana government spent $9,383,487 (GH¢54.3 million) on cooked food during the lockdown period in major cities across the country. This figure was estimated to have fed 470,000 families within Greater Accra and Kumasi environs in the heat of the pandemic (Nunoo, 2020).

According to Hillen (2020), the pandemic led to the popular use of online grocery shops which also saw a major rise in its food prices. Similarly, Buchholz (2020), also reported that food prices globally went up in 2020 as a result of the corona virus pandemic. Data shows that the FAO global food price index ticked up from 102.5 to 107.5 between 2019 and 2020 (Buchholz, 2021).

Impact of the COVID-19 Pandemic on the Ghanaian agri-food systems.

The COVID-19 pandemic had unquestionable devastating implications for worldwide food systems, with the global south being no exception. Even before this pandemic, Ghana's agri-food systems had numerous challenges, including poor road networks, marketing, storage, and safety, insufficient machinery and farm supplies, and farmers lacking the capital to finance their farms seasonally, to name a few (Darkwah, 2021). Quarantines and restrictions were prioritized in most countries as part of the response to the virus' spread. These measures had a significant impact on food production, availability, supply chains, and consumer preferences for food commodities (Siche, 2020). The narrative was similar in Ghana, where border closures and import bans highlighted how fragile and vulnerable the country's food systems have been.

The country's agricultural production is characterized by a rain-fed system, with smallholder rural farmers totally reliant on farm machinery and inputs from nearby urban cities (Kwapong *et al.*,2021). Due to the pandemic's restrictions, these machinery and agricultural inputs operators who supply rural farmers were unable to travel between communities. This situation often delayed output, resulting in lower yields in most crops cultivated during the pandemic's peak (Agyei -Holmes *et al.*, 2021). Again, the supply chain was directly impacted, since restrictions necessitated the observance of social distancing standards, causing delays in transportation and logistics operations within the sector. Another troubling event was the ongoing food inflation of basic food commodity prices across the country,

resulting in nutrition failures and food insecurity at the household level.

COVID-19 and the Way Forward for The Ghanaian Agri-Food Systems.

Following pre-COVID-19 projections, by 2030, almost 9 out of 10 extremely poor individuals would be in Social Secuirty Administration (Bukari *et al.*, 2021). According to current projections, COVID-19 will stall global progress toward achieving zero poverty and hunger in SSA nations by three years by 2030 (Bukari *et al.*, 2021), including Ghana, making it difficult to reach zero hunger.

Research by Agyei-Holmes *et al.* (2021) identified some already established policies that proved to be highly useful during the pinnacle of the COVID-19 uncertainties. The National Food Buffer Stock Company's (NAFCO) one-district-one-warehouse strategy ensured that grains were accessible and available in most areas, including vulnerable inmates in prisons. Planting for food and jobs (PFJ) was also acknowledged for consolidating grain, legume, and cereal improvement. Nonetheless, large towns including cities like Accra and Kumasi saw increases in food purchase prices. Darkwah (2021) findings, showed how the PFJ flagship program gave insufficient attention to critical components of the agri-food system such as processing, marketing, transportation, safety, and nutrition.

In light of the aforementioned concerns, various debates in Ghana's agricultural policy area have advocated for a comprehensive resilience strategy, analysis, and policy-oriented interventions aimed at establishing a sustainable and resilient food system. For example, during the commemoration of World Food Day 2021, FAO emphasized the need for a strategic partnership with governments and all major stakeholders to collaboratively work together and identify the necessary investments and reforms to strengthen our agri-food system's resilience to any uncertainties.

Available research findings and policy papers (Vorley *et al.*, 2012; Rozaki, 2020) have also proposed the following strategies to overcome all pandemics and secure food in the future: Farmers are being encouraged to build networks for their agricultural input supply; partnering with private sectors to rigorously invest in warehouse infrastructure; supporting farmers with soft loans; investing in the food processing system, strengthening the online systems for organizing food trade, delivery and payment; as well as investing in national data systems to acquire real-time information for improved decision-making, are just a few considerations.

Results from respondents

Out of the total respondents, 61.8% were females whiles 38.2% were males. When asked if COVID-19 had negative impact on food security, a majority (85.3%) said yes. On whether COVID-19 affected respondents personally with regards to food security, 60.3% of the total said yes. This was so because a maximum of 55.9% indicated that they ate less during the peak of the pandemic, whereas 60.7% said they had several challenges in getting food during the peak of the pandemic (Figure 1). All respondents (100%) had their highest level of education to be tertiary, ranging from the age of 19 to 38 years. Most respondents, 94.1% are single whiles the remaining were married. All respondents agreed to the fact that the prices of food items escalated during the peak of the pandemic and food was difficult to come by.

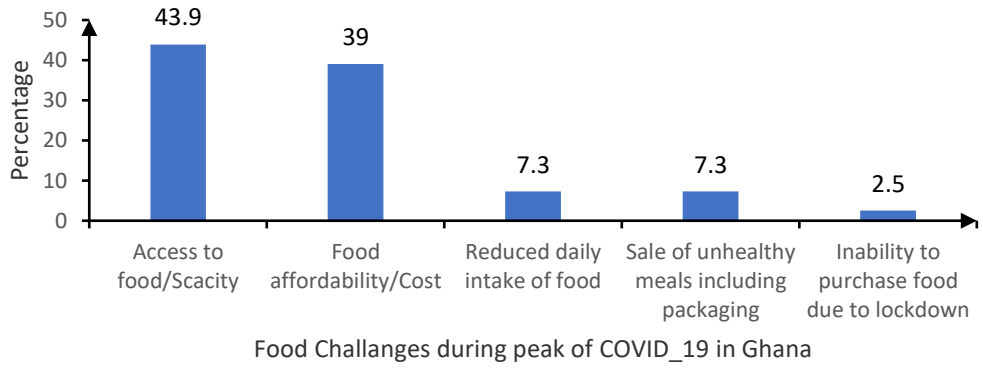

Figure 1: Food challenges faced by respondents during the peak of COVID-19 in Ghana.

With food security questions, respondents attached more importance to questions on availability of food on the market with an RII of 0.67 followed by access to food with an RII of 0.59 whilst affordability of food with an RII of 0.54 was attached with least importance (Table 1). From descriptive statistics, respondents agreed to all four but one question (mean of 3.22 ± 1.51) on food security as shown in Table 2. A total of 63.2% of the respondents indicated that they have developed strategies to control future food security challenges should there be a pandemic. Some of the individual strategies mentioned include; buy food in bulk and store for lean seasons, develop home gardens to cater for vegetables and some fruits and reduce food wastage of over eating (Figure 2).

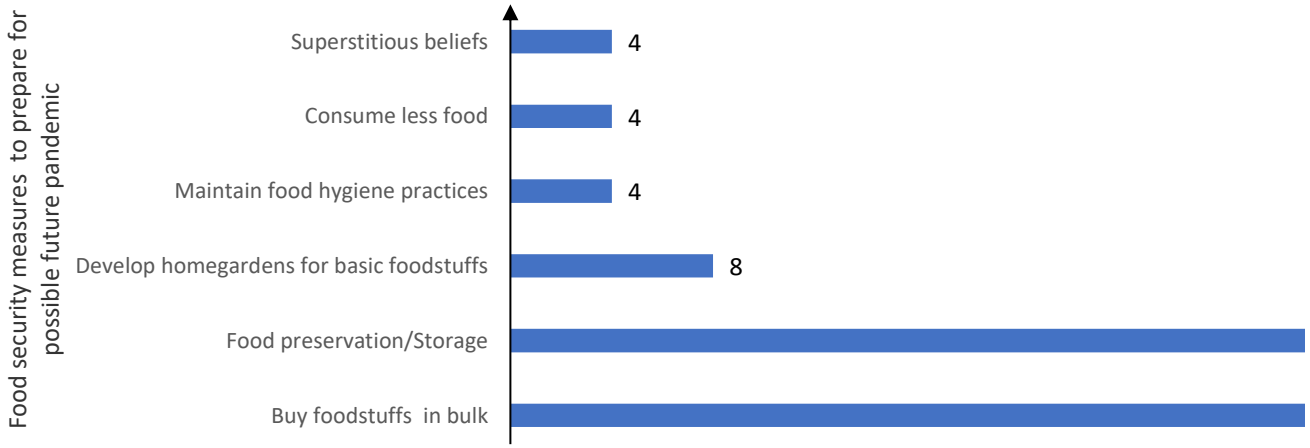

Figure 2: Proposed measures to combat food shortage by respondents.

Table 1: Relative Importance Index of respondent's perceptions of food security status during COVID-19

Perception statements	SA (5)	A (4)	N (3)	D (2)	SD (1)	Total	n	A*n	RII	Rank
I was not able to afford food	35	40	63	30	15	183	68	340	0.54	4th
I was not able to access food	30	64	78	20	10	202	68	340	0.59	2nd
There was less available food on the market	50	112	45	14	8	229	68	340	0.67	1st
I was not able to eat balance diet	40	36	72	20	17	185	68	340	0.54	3rd

n=68, Relative Importance Index (Ayarkwa, 2022), numbers in parenthesis are weights attached to Likert scale questions. SA (Strongly agree), A (Agree), N (Neutral), D (Disagree), SD (Strongly disagree)

Table 2: Descriptive statistic of response to perception statements on food security during the peak of COVID 19 in Ghana.

Perception statements	Mean ± SD	Interpretation
I was not able to afford food	3.79 ± 1.50	Agree
I was not able to access food	3.53 ± 1.43	Agree
There was less available food on the market	3.22 ± 1.51	Neutral
I was not able to eat balance diet	3.97 ± 1.52	Agree

DISCUSSION

The results on the negative impact of the pandemic on food security confirms what was stated by Mouloudj *et al*. (2020) that, the pandemic threatened food security even in some developed countries, whereas developing countries are the most affected due to their high dependency in securing their food supplies. Results obtain on the challenges in getting food during the pandemic confirms the observation made by Mouloudj *et al*. (2020) that, food demand is affected by the pandemic due to the movement constraints, low purchasing power which has a tremendous impact on vulnerable groups. In these times of crisis, the world's poorest, who predominantly depend on agriculture are likely to run out of food. Consequently, hunger, starvation and malnutrition due to inadequate and unhealthy feeding habits, put their health and wellbeing at risk (Workie *et al*., 2020). This reflects the observations from individuals affected by the pandemic and they eating less during the peak of the pandemic. The COVID-19 pandemic had a strong impact on both developed and fragile economies, leaving the negative impacts on production networks, a significant reduction on agricultural activities (Buheji *et al*., 2020). According to Stephens *et al.* (2020), food systems and food distribution channels of most countries across income

spectrum have been highly disrupted. This was evident in results as respondent attached strong importance (0.67) to availability of food. A study conducted by Jafri *et al.* (2021) revealed that respondents reported changes in the price of food items, particularly in African countries and is evident in results of this study. A decline in imports can lead to increased prices and a shortage of basic consumer goods, which may result in an increased inflation in some countries. According to Gyimah (2020), COVID-19 had a significant impact on food security due to the partial lockdown of some parts of the country which led to the lack of access to food for Ghanaians as reported in this paper. With regards to food nutrition, people were more interested in getting something to eat rather than its nutritional content, and this is in agreement with respondents' views on the perception statement "I was not able to eat balance diet". The sustainability of food was uncertain as food sources were unreliable. The availability and accessibility of food was hampered by banned vehicles, which threatened food security (Gyimah, 2020) as seen in response to perception statements for the respective themes.

CONCLUSION

The COVID-19 pandemic, though now of mild effect on the health of Ghanaians has left an indelible mark on the economic status; thus, agriculture and food security status of the country. It is evident that individuals have placed in measures to handle possible future pandemics, but it is much more important for the government to implement result generating policies that will quickly revive food production and its consumption. This will help enhance the living standards of the citizens as well as help achieve the Sustainable Development Goals 1 (No poverty), 2 (Zero Hunger) and 3 (Good health and Well-being).

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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