

Short Communication

THE IMPACT OF COVID-19 ON NIGERIAN FOOD SYSTEMS

Nicholas-Okpara VAN¹, Utazi IA^{2*}, Adegboyega MA^{1,6},
Ezeanyaso CS³, Ita B⁴ and AJ Ubaka⁵



Viola A. Nwachukwu Nicholas-Okpara

*Corresponding author email: sinachi54@gmail.com

¹Nutritional and Toxicology Division, Food Technology Department, Federal Institute of Industrial Research, Oshodi, Nigeria

²Food Science and Technology Department, Abia State University, Abia State, Nigeria

³Chemical, Fibre and Environmental Technology Department, Federal Institute of Industrial Research Oshodi, Nigeria

⁴Biotechnology Department, Federal Institute of Industrial Research, Oshodi, Nigeria

⁵Food Science and Technology Department, Federal University of Technology Owerri, Imo State, Nigeria

⁶Animal Science Department, University of Benin, Edo State, Nigeria



ABSTRACT

The Nigerian food system is facing major challenges with high population growth, a high number of people living in extreme poverty, rapid urbanization, and stagnating agricultural productivity. Socioeconomic status is a key indicator of the Nigerian food system. This paper aims to examine the impact of COVID-19 on Nigerian food systems. These reviews were obtained from white papers written by organizations like the United Nations (UN), and other studies on food systems, agriculture, and the socioeconomic status of Nigerians concerning the COVID-19 pandemic were reviewed. In recent years, the world has recorded several incidences of disasters that have disrupted the food system, leading to evidence of food insecurity. The most recent is the outbreak of COVID-19, which is more than just a disease. It resulted in the combined disruption of global economic and social stability. The food system and all that is dependent on it were severely affected by COVID-19. The global situation of poverty and malnutrition was exacerbated as a result of the direct and indirect impact of the COVID-19 pandemic. In a phone interview, it was recorded that 37% of Nigerian households experienced a drastic drop in income, pushing many to the brink or into the threshold of poverty. Many of the Nigerians interviewed agreed that the quantity and quality of their diet had diminished in comparison to the same period in the previous year. Another survey in Nigeria reported that 23.8% of its respondents reduced the portion of their meals, 20.8% reduced their frequency from 3 to 2 meals per day, and 13.8% substituted highly nutritious foods with less nutritious and cheaper ones to cope with hunger during the Pandemic. To cushion the impact of COVID-19 on Nigeria's food systems, there is a need to reinforce the existing incentives for restructuring Nigeria's economy away from reliance on oil. Further, remittances from other countries would also contribute towards the development of local sectors such as agriculture and food manufacturing companies, which can generate employment and feed Nigeria's growing population. Also, the development of the agro-food system will necessitate investments in research and rural infrastructure. In this way, federal and state policies can aid recovery from COVID-19 and help Nigeria build more resilient food systems.

Key words: COVID-19, Pandemic, Nigeria, Food systems, Agriculture, Food security, Food safety, Socio-economic impact



INTRODUCTION

A significant correlation has been established between the phenomenon of food security and the advancement of civilizations, as noted by Gani and Prasad [1]. Food security, as defined by the Food and Agriculture Organization (FAO) during the 1996 World Food Summit in Rome, refers to the physical and economic access to an abundant supply of safe and nutritious food that is suitable for individuals' dietary preferences and requirements for maintaining a healthy and active lifestyle [2]. Conversely, food insecurity, which stands in opposition to food security, is characterized by low agricultural productivity and widespread poverty, ultimately leading to the regression of human development and the collapse of civilizations throughout history [3].

Food insecurity arises due to the intricate interplay of various factors within the food system, including climate change, natural and biological disasters, ineffective governance, inadequate agricultural practices and policies, and suboptimal land use policies, among others. The food system encompasses all activities involved in the production, aggregation, processing, distribution, consumption, and disposal of food products originating from agriculture, forestry, and fisheries, as outlined by the FAO in 2018 [4].

In recent years, the world has witnessed numerous incidents of disasters that have disrupted the food system, resulting in evidence of food insecurity. Notably, the most recent and impactful event is the outbreak of COVID-19. The consequences of COVID-19 extend beyond being a mere disease, as it has caused significant disruptions to global economic and social stability. The pandemic has had a severe impact on the food system and its dependencies. Poverty and malnutrition at a global level have worsened due to the direct and indirect effects of the COVID-19 pandemic [5].

COVID-19 is a highly infectious disease that shares similarities with pneumonia, and it carries a mortality rate of up to 3.4% [6]. The disease is highly virulent, primarily transmitted through close contact and the dispersion of droplets by both symptomatic and asymptomatic infected individuals.

In order to mitigate the spread of COVID-19, national and international governments and authorities have implemented public health measures, including movement restrictions to public places and travel bans. Numerous studies have examined the impact of these restrictions and have found them to have a profound effect on nearly all aspects of global development. Unfortunately, with only a



decade left until the target year of 2030 for achieving the United Nations' Sustainable Development Goal of zero hunger and a sustainable food system, the current circumstances appear highly unfavourable. The 2020 World Food Programme Global report [7] on food crises reveals that an additional 135 million people have become acutely food insecure, with approximately 54% of these individuals residing in Africa. The report also identifies Nigeria as one of the top ten countries facing severe food crises.

Against this backdrop, the present review aims to explore the repercussions of COVID-19 on specific drivers of the food supply system in Nigeria, building upon existing research and studies.

Impact of COVID-19 on Agricultural Production

In developed countries, the production of staple crops, particularly maize, wheat, and soybeans, tends to be highly mechanized, with significant inherent social distancing among workers. Farms in these regions often employ large-scale machinery and minimal labour for land preparation, sowing, and harvesting. To mitigate the risks associated with COVID-19, adaptations have been made to these labour-intensive aspects of agriculture by implementing measures such as staggered shifts to avoid concentrated gatherings of workers in the field.

Low farm mechanization is a trait of countries of low-income regions. Large-scale mechanization is either too costly for many farmers or too difficult to utilize in the case of non-staple foods, such as fruits and vegetables, that require human hands for planting, weeding, and/or harvesting [8]. As a result, agriculture in Nigeria is highly labour-intensive [9]. In fact, Agriculture has remained one of the biggest employers of labour. Over 35% of the Nigerian population is directly employed in the agricultural sector [10]. About 76% of families are directly or indirectly dependent on agriculture as a means of livelihood. Upon the announcement of the lockdown to curb the spread of COVID-19, several restrictions were implemented. These measures led to serious disruptions in the agricultural sector, affecting labor, production, distribution, marketing and consumption of agricultural produce and products. The labour-intensive system of the Nigerian agriculture sector often requires people to work in densely packed environments such as open markets in urban areas, large-scale farms and processing plants which presents the entire populace at a higher risk of transmitting COVID-19. Had it been that the Nigerian agriculture sector is more capital-intensive and highly mechanized, the need for labour-intensive production as well as the shock experienced by the food system would be minimal. The effect of COVID-19 on agricultural production manifested in

food and feed scarcity, inflation, post-harvest losses and general food insecurity in Nigeria.

Farmers' Access to Information

Agricultural extension outreach forms a major source of information among rural farmers and agro-processors in Nigeria [11]. Farmers mostly require information on the current price of farm produce, weather, agricultural loans, improved seeds and livestock species, fertilizer and pesticides, and suitable storage facilities to boost agricultural productivity and increase their income [12]. Extension visits to farm villages by motorcycle or car are highly common in the Nigerian extension service [13]. The COVID-19 restriction guidelines failed to recognize extension officers as essential workers, which negatively affected extension services [14]. Despite the government's efforts in implementing the 'E-extension system," which involves short tutorial video clips, extension workers were inadequately equipped with the needed technological resources to reach the many farmers attached to them [14]. Similarly, the adoption of contemporary ICT technologies such as the internet and smartphones, which are useful in the implementation of the E-system, remains low among rural farmers [15].

Agricultural Productivity and Labor

A labour shortage in the agricultural sector was confirmed due to limited access to farm mechanization [16]. The enforcement of the lockdown halted most agricultural activities across the country. Unfortunately, the peak of agricultural production and planting season in Nigeria coincided with the lockdown announcement. During this period, the demand for labour was highly unmet as there was a strict restriction of movement and farm workers was denied access to work on farms [17]. The shortage of labour led to many other problems. A lower hectare of land was cultivated, and a lower agricultural output was evidenced for the year's planting season [14]. In addition, labour required for harvesting and processing operations was equally absent, which led to severe losses. The shortage of labour also led to a shortage of animal feedstock and spiked prices for animal-based foods and products [17].

Transportation, Distribution and Marketing

Interstate transportation of agricultural produce, including animals, is an integral part of the Nigerian food supply system. In Nigeria, COVID-19 movement restrictions included interstate travel bans. Although COVID-19 restrictions excluded the transportation of food, a stringent procedure must be followed to obtain travel permits. However, offices issuing these permits were either closed due to the lockdown, short on staff or had restricted working hours to handle the



overwhelming requests in record time [18]. The problems with travel permits led to a delay in the delivery of farm produce, significant post-harvest loss, and an increase in the price of transportation and agricultural commodities [19]. The negative report of travel bans during the pandemic was accompanied by large quantities of fruits and vegetables that were lost daily in Yankaba and Yanemo markets in Kano state [20].

During the pandemic, global food distribution systems were disrupted as farmers had difficulties developing new ways to sell their farm produce due to the closure or partial closure of many sale outlets, such as restaurants [8]. Open markets are the most important structure in the distribution of farm products in Nigeria. During the lockdown, access to markets by both consumers and retailers was severely restricted to a few hours per day. This led to a harvest surplus and significant post-harvest losses. The effect of this phenomenon is disadvantageous to every player in the food system. For producers and marketers, it led to huge economic and resource losses, while it threatened consumers with imminent food insecurity due to the inaccessibility of food.

The closure of land and air borders was adopted by all countries of the world to keep the spread of COVID-19 at bay. To this end, food imports and exports became restricted. Nigeria is heavily reliant on imported food products such as wheat, rice, milk, seafood, and beverages, which are major staple foods in Nigerian households. These foods became scarce, and their prices became astronomical, leaving households with few options. These led to the scarcity and increase in price of these popular foods, directly leaving an already vulnerable household with constrained purchasing power.

Socioeconomic Impact of COVID-19 in Nigeria

COVID-19 resulted in the loss of income and assets, jeopardizing access to food [8]. At the onset of the pandemic, it was feared that the prospects for food security and economic stability would dwindle in developing countries [8]. There was a prediction that sub-Saharan Africa would increase its poverty by 23% [21]. For Nigeria, it was speculated that household income would decrease by 33% [22]. Since the restrictions were implemented to curb the spread of COVID-19, the vast majority of the population has disengaged from economic activities. 80% of households in Nigeria were found to have at least one working family member sit at home through the 5-month lockdown [21]. As it turned out, the impact of COVID-19 was significantly felt by households with lower incomes. In Ethiopia, the report stated that the food security challenges were more severe in low-income households due to the decline or loss of income than food shortages [23]. It is well



established in basic economics that households purchase preferred foods based on their cost, which is usually less than or equal to their income [24]. The prevalent economic unproductivity of the vast majority of the population led vulnerable households to switch to less nutritious foods that were cheaper.

In a phone interview, it was recorded that 37% of Nigerian households experienced a drastic drop in income, pushing many to the brink or into the threshold of poverty [25]. Many of the Nigerians interviewed agreed that the quantity and quality of their diet had diminished in comparison to the same period in the previous year. Another survey in Nigeria reported that 23.8% of its respondents reduced the portion of their meals, 20.8% reduced their frequency from 3 to 2 meals per day, and 13.8% substituted highly nutritious foods with less nutritious and cheaper ones to cope with hunger during the pandemic [26].

Ready-to-eat foods play an important role in helping urban dwellers of lower income classes meet their daily nutritional requirements. 25% of the food expenditure of urban dwellers is allocated to ready-to-eat foods sold on the streets [27]. The total lockdown resulted in difficulties on the part of consumers and food vendors. Consumers were unable to meet their dietary needs, while vendors had to deal with income loss and lower purchasing power [28].



Figure 1: Nigerian Food Market

COVID-19 and Food Policies in Nigeria

As regards policies, many food-producing countries responded to the fear of food shortages and uncertainty of supply by temporarily banning exports. Food prices skyrocketed, and the situation appears to be a repetition of the global food price crisis of 2008 and 2010 [29]. For example, the global price of rice spiked by 20% between January and April 2020 [8]. In Nigeria, the price of rice went up by 66.6%, and the price of Garri, a locally produced cassava-based staple, rose by 300% [30]. The global price of rice began to decline as major producing countries like Vietnam phased out their export ban around May, but food scarcity persisted in Nigeria. It was reported that one of the major reasons for food scarcity was food hoarding by market price with the hope that food prices would go higher to fetch a higher bid [20].

COVID-19 and Food Quality and Safety



Figure 2: A Nigerian Market

Poor market sanitation has been a problem in Nigeria and it is a major cause of infectious diseases and environmental degradation [31]. The market had more than 10,000 workers handling thousands of tons of vegetables, fruits, meat and seafood daily. This led to the total closure of the market to human activities and disease spread in the market. During the pandemic, most markets in urban areas were shut. Trade was carried out in regulated areas for a few numbers of hours during the day. On the contrary, rural farms where farmers and middlemen trade were operating at full throttle. Using the Gosa market in rural Abuja as a case

study, it was observed that there was no water for hand washing or hand sanitizing [32]. The market also lacked basic amenities such as toilets and water [32]. Marketers and sellers relieved themselves of nature calls in nearby bushes. There was no sense of social distancing and the risk of COVID-19 and other infectious diseases was reportedly extremely high.

Since the documentation of the first cases of COVID-19, there has been no official report of food being a route of transmission [23]; however, this is a topic of controversy. The acidic environment of the stomach is unsuitable for the virus to thrive [23]. COVID-19 virus has been discovered to survive on surfaces [33]. COVID-19 virus can remain active on surfaces used for packaging [33]. There are adverse choices of packaging materials in Nigeria depending on the food products [27]. The traditional packaging materials such as baskets, leaves, sacks and barrels are still very much in use in transporting food materials. These sorts of packaging are known to offer little protection on food products and are usually not efficient for handling, processing and protection against microbial invasion [34]. Plastic is one of the most popular packaging materials for food in Nigeria and the virus has been found to survive for up to 72 hours on its surface [33]. This may have heightened the risk of transmission through food. Many Nigerians particularly in the urban areas adopted the recommendation of hand washing to counter the disease spread through surfaces.

Most foods require water to be cleaned. The incidence of COVID-19 also spotlighted the issues of water inaccessibility in many parts of Nigeria. The Nigeria Demographic and Health Survey reported that the majority of Nigerians about 66.9% do not have water in their premises [35]. This makes sanitation and keeping with the guideline difficult in some areas. According to the report, 31.9% of Nigerians have no access to water. Access to water in major food-producing states like Benue and Bauchi was as low as 2.4% and 13.9% respectively, [35].

Certain eating practices and unhygienic food preparation may also increase the spread of COVID-19 [36]. Food vending is a common practice in Nigeria. The hygienic/sanitary conditions of food vendors have always been a major concern as there is an obscurity in the origin of resources used in the food preparation process [37]. At all stages of handling, street foods are often a safe breeding place for all sorts of disease microorganisms. Often food vendors make use of push carts or uncompleted buildings as a point of sale. At vending sites, hand washing is often done in bowls of water without soap [38]. The rise of COVID-19 and the emphasized recommendation of hygiene led consumers to be wary of street food vendors. A survey on the impact of COVID-19 on food vendors and their



customers [28]. Street vendors lost scores of economic resources and customers. Many food vendors responded that many customers have lost trust in them due to the fear of unhygienic food preparation practices. Most customers on the other hand were reported to show more interest in the hygiene of the foods sold by food vendors [39]. One of the recipients commented on the improvement of hygiene practices among food vendors in his/her locality since the incidence of the pandemic.

CONCLUSION, AND RECOMMENDATIONS FOR DEVELOPMENT

The impact of covid-19 was seriously felt on Nigeria's food systems. Nigerians felt this impact from a decrease in agricultural production to most farmers not having access to information since the major source of information among farmers and agro-processors in Nigeria is mainly through agricultural extension outreach Programmes. Also, the socio-economic status of most Nigerians declined as many households' skills/labor was not required during the pandemic period and as such there was a decline in their income and their eating patterns.

These reinforce the existing incentives for restructuring Nigeria's economy away from reliance on oil and remittances from other countries and towards the development of productivity-boosting and poverty-reduction sectors such as agriculture and food manufacturing companies, which can generate employment and feed its growing population. Also, the development of the agro-food system will necessitate investments in research and rural infrastructure. In this way, federal and state policies can aid recovery from Covid-19 and help Nigeria build more resilient food systems.



REFERENCES

1. **Gani A and BC Prasad** Food security and human development. *International Journal of Social Economics*. 2007; **34(5)**: 310-319.
2. **Pérez-Escamilla R** Food security and the 2015–2030 sustainable development goals: From human to planetary health: Perspectives and opinions. *Current developments in nutrition*. 2017; **1.7**: e000513.
3. **Mkandawire P and ND Aguda** Characteristics and determinants of food insecurity in sub-Saharan Africa. In *Environment and health in sub-Saharan Africa: Managing an emerging crisis*: 2009; 3-23 Springer, Dordrecht.
4. **FAO**. Sustainable food systems Concept and framework. 2018; <https://www.fao.org/3/ca2079en/CA2079EN.pdf> Accessed February 2021.
5. **Swinnen J and R Vos** COVID-19 and impacts on global food systems and household welfare: Introduction to a special issue. *Agricultural Economics*. 2021; **52(3)**: 365-374.
6. **Wang C, Wang Z, Wang G, Lau JY, Zhang K and W Li** COVID-19 in early 2021: current status and looking forward. *Signal Transduction and Targeted Therapy*. 2021; **6(1)**: 1-14.
7. **WFP**. 2020 - Global Report on Food Crises. World Food Programme publications. 2020; <https://www.wfp.org/publications/2020-global-report-food-crises> Accessed June 30th, 2022.
8. **Laborde D, Martin W, Swinnen J and R Vos** COVID-19 risk to global food security. *Science*. 2020; **369(6503)**: 500-502.
9. **Idu MA and CS Onyenekwe** Mitigating COVID-19 effects on farmers: The role of commissioners of agriculture in Nigeria. *Agro-Science*. 2021; **20(4)**: 65-69.
10. **World Bank Group**. Nigeria Development update, Retrieved from: [Jumpstarting Inclusive Growth : Unlocking the Productive Potential of Nigeria's People and Resource Endowments \(English\)](#) Accessed June 2021.
11. **Opara UN** Agricultural information sources used by farmers in Imo State, Nigeria. *Information Development*. 2008; **24(4)**: 289-295.



12. **Abubakar MK and A Magaji** Information sources and needs of small scale farmers in Katsina State, Nigeria. *Samaru Journal of Information Studies*. 2019; **19(2)**: 48-62.
13. **Sennuga SO** Use of ICT among smallholder farmers and extension workers and its relevance to sustainable agricultural practices in Nigeria. 2019 (Doctoral dissertation, Coventry University).
14. **Issa FO** Agricultural Extension Services amidst COVID-19 Pandemic in Nigeria: Policy Options. *Journal of Agricultural Extension*. 2021; **26(1)**: 99-107.
15. **Ezeh NA** Access and application of information and communication technology (ICT) among farming households of south-east Nigeria. *Agriculture and Biology Journal of North America*. 2013; **4(6)**: 605-616.
16. **Ilesanmi FF, Ilesanmi OS and AA Afolabi** The effects of the COVID-19 pandemic on food losses in the agricultural value chains in Africa: The Nigerian case study. *Public Health in Practice*. 2021; **2**: 100087.
17. **Nnodim O** Food production suffers, prices balloon as floods, COVID-19 devastate farmlands. 2020. Retrieved from: [Food production suffers, prices balloon as floods, COVID-19 devastate farmlands - Punch Newspapers](#) Accessed October 2021.
18. **FAO**. National agrifood systems and COVID-19 in Nigeria effects, policy responses and long-term implications. 2021; Rome. Available from: [National agrifood systems and COVID-19 in Nigeria](#) Accessed June 2021.
19. **Obayelu AE, Obayelu OA, Bolarinwa KK and RA Oyeyinka** Assessment of the immediate and potential long-term effects of COVID-19 outbreak on socioeconomics, agriculture, security of food and dietary intake in Nigeria. *Food ethics*. 2021; **6(1)**: 1-22.
20. **Abdul IM** COVID-19, LOCKDOWN and transitory food insecurity in Nigeria. *Food Agr Manag*. 2020; **1**: 26-30.



21. **Mahler GD, Lakner C, Castaneda RA and H Wu** The impact of COVID-19 (Coronavirus) on global poverty: Why Sub-Saharan Africa might be the region hardest hit. 2020. Available from: <https://blogs.worldbank.org/opendata/impact-covid-19-coronavirus-global-poverty-why-sub-saharan-africa-might-be-region-hardest> Accessed October 2021.
22. **Adnam A** Nigeria ramps up response efforts to smash coronavirus. 2020 Retrieved from: <https://www.aa.com.tr/en/Africa/Nigeria-ramps-up-response-efforts-to-smash-coronavirus/1771922> Accessed June 2021.
23. **Aday S and MS Aday** Impact of COVID-19 on the food supply chain. **Food Quality and Safety**. 2020; **4(4)**: 167-180.
24. **National Research Council**. Supplemental nutrition assistance program: examining the evidence to define benefit adequacy. 2013.
25. **Open Africa Database Nigeria Demographic and Health Survey**. Open Africa 2020 Retrieved from: <https://open.africa/dataset/nigeria-demographic-and-health-survey-2018/resource/7d6a6702-a1ba-4d26-a0eb-54dcf5248c6f> Accessed October 2021.
26. **The World Bank Group**. Retrieved from: <https://microdata.worldbank.org/index.php/catalog/3712> Accessed October 2021.
27. **Zougbede K** Coronavirus: Improving Resilience in West African Food Systems. The Africa Report. 2020 Retrieved from: <https://www.theafricareport.com/28356/coronavirus-improving-resilience-in-west-african-food-systems/> Accessed June 2021.
28. **Majing O and E Regina** Effects of the COVID-19 lockdown on the livelihood and food security of street food vendors and consumers in Nigeria. *Journal of African Studies and Development*. 2021; **13(4)**: 106-114.
29. **Anderson K, Ivanic M and W Martin** In The Economics of Food Price Volatility, J.-P. Chavas, D. Hummels, B. Wright, Eds. 2014 (Univ. Chicago Press). www.nber.org/chapters/c12818.pdf Accessed June 2021.



30. **Eyinla TE, Samuel FO, Oluwaseun A, Leshi OO, Brai BI and WA Afolabi** Food Access and Experience of Food Insecurity in Nigerian Households during the COVID-19 Lockdown. *Food and Nutrition Sciences*. 2021; **12(11)**: 1062-1072.
31. **Abejegah C, Abah SO, Awunor NS, Duru CB, Eluomma E, Aigbiremolen AO and EC Okoh** Market sanitation: A case study of Oregbeni market Benin-city Edo State, Nigeria. *International Journal of Basic, Applied and Innovative Research*. 2013; **2(2)**: 25-31.
32. **Igbine A** Water Poverty in Nigeria: Effects and Impacts of COVID-19. Pulitzer center. 2020. Retrieved from: <https://pulitzercenter.org/stories/water-poverty-nigeria-effects-and-impacts-covid-19> Accessed June 2021.
33. **Van Doremalen N, Bushmaker T, Morris DH, Holbrook MG, Gamble A, Williamson BN and VJ Munster** Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. *New England Journal of medicine*. 2020; **382(16)**: 1564-1567.
34. **Evivie SE, Ogwu M, Ebahamiegbeho PA, Abel ES, Imaren JO and JO Igene** Packaging and the Nigerian Food Industry: Challenges and Opportunities. 2021. In book: Food, Technology and Culture in Africa Publisher: Reamsworth Publishing Limited, Nigeria Ed. Clement A. Ogunlade, Ph.D Kehinde M. Adeleke Mutiat T. Oladejo, Ph.D. 1-32.
35. **Shahidi F** Does COVID-19 affect food safety and security? *Journal of Food Bioactives*, 2020; **9**: 1-3.
36. **Okojie PW and EC Isah** Sanitary conditions of food vending sites and food handling practices of street food vendors in Benin City, Nigeria: implication for food hygiene and safety. *Journal of environmental and public health*, 2014.
37. **Aaron K** Coronavirus cause: Origin and how it spreads. 2020. Retrieved from: <https://www.medical-newstoday.com/articles/coronavirus-cause> Accessed June 2021.
38. **Barrot LD, Calderon C and L Serven** Retrieved from: [Growth in Sub-Saharan Africa is Slower than Expected](#) Accessed October 2021.
39. **WFP**. Global Report on Food Crises. World Food Programme publications. 2020 Available from: <https://www.wfp.org/publications/global-report-food-crises-2022> Accessed June 2022.

