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Faculty of Tropical AgriSciences



**The Effect of COVID-19 on Food and Nutrition
Insecurity**

BACHELOR'S THESIS

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Declaration

I hereby declare that I have done this thesis entitled “The Effect of COVID-19 on Food and Nutrition Insecurity“ independently, all texts in this thesis are original, and all the sources have been quoted and acknowledged by means of complete references and according to Citation rules of the FTA.

In Prague, 18th April 2024

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Marta Knoblochová

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Abstract

This research explores the profound socio-economic impacts of the COVID-19 pandemic on global food and nutritional security, with a specific focus on vulnerable regions such as Sub-Saharan Africa. The research underscores the heightened risks of hunger and malnutrition resulting from the crisis. Through a comprehensive review of existing literature, the study illuminates the systemic obstacles to food security and puts forth strategic solutions to tackle these issues by analysing the intricate risks between the pandemic and the vulnerability of food systems. It also evaluates the state of food and nutrition security before the pandemic to gauge the impact of disruptions in food production and consumption caused by the crisis. Furthermore, the research assesses the efficacy of implemented interventions in alleviating the strain on food security, underscoring the significance of informing policies and actions for the enduring protection of global systems. The review draws upon articles sourced from web databases, including EBSCO Discovery Service, Google Scholar, and Web of Knowledge, and incorporates a detailed case study. The search utilized 11 keywords encompassing themes such as "Agriculture," "Malnutrition," "Poverty," "Developing Countries," "Health," "Africa," "Access," "Prices," "Pandemic," "Supply Chain," and "Food Security." Ultimately, the goal of the study is to support the achievement of Zero Hunger and Sustainable Development Goals by advocating for sustainable practices and holistic resilience in food security post-COVID-19, thereby guiding future generations toward a more secure and equitable food system.

Key words: Access, Africa, Agriculture, Developing Countries, Health, Pandemic

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List of the abbreviations used in the thesis

AU	African Union
ELCSA	Latin American and Caribbean Food Security Scale
FAO	Food and Agriculture of United Nations
FIES	Food Insecurity Experience Scale
GHI	Global Hunger Index
HFIAS	Household Food Insecurity Access Scale
IDP	Internally Displaced Person
OECD	Organization for Economic Cooperation and Development
PoU	Prevalence of Undernourishment
SARS	Severe Acute Respiratory Syndrome
SDG2	Sustainable Development Goal 2
TNCs	Transnational Agro Business Corporations
WFP	World Food Programme
WFS	World Food Summit

1. Introduction

The COVID-19 pandemic, which lasted from 2020 to 2022, triggered profound socio-economic repercussions across the globe, leading to widespread instability of food and nutritional security. One of the most severely affected sectors of the pandemic, which deeply shook the livelihoods of over 60 % of the world's population, was the agriculture industry (FAO 2023).

This research seeks to shed light on the intricate connections between the pandemic and food systems' vulnerability, with a specific focus on the world's regions, such as Sub-Saharan Africa, where the aftershocks of the crisis are most devastating. Food security depends on the availability, access, utilization, and stability of food, and it emerged as one of the most significant victims of the pandemic, calling for a radical reevaluation of the approach toward sustainable food systems. By means of an extensive literature review, this thesis seeks to address the compounded impact of COVID-19-aggravated malnutrition and food inaccessibility. This review aims to explore the multidimensional nature of food security to present a cohesive view of the socio-economic turmoil caused by the pandemic. This study also demonstrates the heavily increased risks of hunger and malnutrition while exposing the systemic barriers to food security to probe the basis for strategic responses to these challenges.

The study then moves on to a pre-pandemic examination of food and nutrition security, essentially establishing the grounds for pandemic damage assessment. It proceeds to analyse the factors of disruption in both food creation and consumption, addressing the rippling effect of pandemic-related lockdowns, travel restrictions, and economic paralysis on the agricultural sector and the related ones. With an emphasis on the implications on both rural and urban areas, the research presents a nuanced view of food system vulnerability, integrating a range of sources to depict the multi-facetedness of the crisis. The study then discusses the responses formulated and implemented, subsequently describing their achievements in reducing the harm caused by the pandemic on food and nutritional security. Thereby, the study is relevant as it is geared towards informing policy and action. By unravelling the complex thread of exposures that contributed to the rising vulnerability among the most at risk, the research lays a solid foundation for urgent and multi-sectoral policy responses.

Such responses remain critical not only for immediate alleviation and control of food insecurity but for the long-term safeguarding of global systems, as COVID-19 is not the last health crisis to affect global nutritional exploitation. As the dietary effects of the pandemic project on future generations and the third decade head to a closure, the work seeks to underscore the significance of the sustainable effort. In so doing, the research aims to contribute to the global attainment of the Zero Hunger goal, furthering the ideals of the Sustainable Development Goals as it calls for integrated resilience and equity in food security post-COVID-19.

2. Aims of the Thesis

This study aims to examine the socio-economic impacts of COVID-19 on global food security, focusing on vulnerable regions like Sub-Saharan Africa. Additionally, it evaluates pre-pandemic food security for comparison and stresses the need for informed policies to protect global systems sustainably. It seeks to identify barriers to food security worsened by the pandemic and propose solutions.

3. Methodology

A literature review was applied thoroughly and systematically in this research to investigate the influence of COVID-19 on food and nutrition security. The primary objective was to collect, evaluate, and summarise the most relevant academic literature and data to reveal the complexity of challenges concerning the pandemic, with a close focus on Sub-Saharan Africa. To achieve this goal, information was collected using secondary data from a wide range of reputable scientific journals and organisational reports to ensure the stability of the theoretical basis for subsequent analysis. The main databases utilised for the research included Google Scholar, ScienceDirect, Wiley, Web of Science, the World Bank, and, most importantly, the datasets provided by FAO and OECD. The study targeted those sources due to their extensive coverage of issues relating to agriculture, malnutrition, poverty, health, and economic indicators, particularly those data relevant to developing countries and the implications of pandemics.

In terms of the selection process, I used advanced keyword searches with logical operators “OR, AND, NOT” to maintain a focus during my research activities. I used a total of 11 keywords defining the main focus of my search: “Agriculture,” “Malnutrition,” “Poverty,” “Developing Countries,” “Health,” “Africa,” “Access,” “Prices,” “Pandemic,” “Supply Chain,” and “Food Security.” In addition, I utilised Boolean operators to narrow or expand the search focus for the queries to ensure more precise outcomes. The relevant literature was chosen based on the following criteria: relevance to the abovementioned keywords, publications no older than five years to provide up-to-date data, as well as an attempt to favour empirical studies that bring fresh insights into the impact of COVID-19 on food systems. The sources were chosen after screening the titles and abstracts based on relevance and full-text analysis to confirm that they contained information directly relevant to the impact of COVID-19 on food and nutrition security.

Analysis and Synthesis

The literature was analysed critically to identify recurrent themes, possible discrepancies in results, and gaps in the existing body of research. Such analysis was vital to provide a clear insight into the holistic context of disruptions in food security systems caused by the pandemic and their socio-economic implications. The synthesis of the literature ensured an integrated view of the dimensions and repercussions of the influence across regions, as well as the vulnerabilities and capacities of agricultural systems in Sub-Saharan Africa.

4. Literature Review

4.1. Conceptual Framework

Food insecurity is a problematic subject that affects the quality of life and nutritional status of populations worldwide as it intersects agriculture, economics, and health (Myers 2020). According to FAO (2023), food insecurity is a state when a person lacks regular access to enough safe and nutritious food for normal growth and development and an active and healthy life.

In 2022, approximately 38 % of individuals globally experiencing moderate to severe food insecurity, equating to over 900 million people, faced severe food insecurity. This condition meant that at various times throughout the year, they encountered situations where they completely depleted their food supplies and, in extreme cases, went a full day or longer without consuming any food (FAO 2023).

Nutrition security occurs at the organism level and is realised when the human body's cells, tissues, and organs receive adequate nourishment to function correctly. It emerges from the intersection of food security and health security, encompassing their intricate relationship. It is achieved through access to a nutritious diet and both preventive and curative healthcare services. Furthermore, the availability of household income plays a significant role in determining levels of both food security and health, underscoring their connection to nutrition security (Pérez-Escamilla & Segall-Corrêa 2008).

4.1.1. Hunger, malnutrition and poverty

Food insecurity is associated with concepts of hunger, malnutrition, and poverty, so it is important to understand the relationship between them. Hunger is the physical discomfort caused by not having enough calories, while malnutrition involves either too little or too much intake of nutrients, leading to health problems. It is crucial to note that while all hungry people are considered food insecure, not everyone facing food insecurity is necessarily hungry. Food insecurity can also stem from inadequate nutrient intake due to poor quality of available food (FAO 2008).

Moreover, malnutrition can be caused by food-related issues like food insecurity. However, it can also arise from non-food-related problems such as poor childcare practices, lack of health services, or an unhealthy living environment. Although poverty is a direct cause of hunger, the reverse is also true; inadequate nutrition can keep individuals in a cycle of poverty. The Organisation for Economic Co-operation and Development (OECD) defines poverty as a multifaceted condition that includes various forms of deprivation affecting human capabilities, including access to food, healthcare, education, and more (FAO 2008).

Figure 1. depicts a cyclic relationship between poverty, food insecurity, hunger and nutrition, poor growth and development, and low productivity. It is evident that due to poverty, individuals may find it challenging to afford food, leading to hunger and nutrition, such is likely to cause low growth.

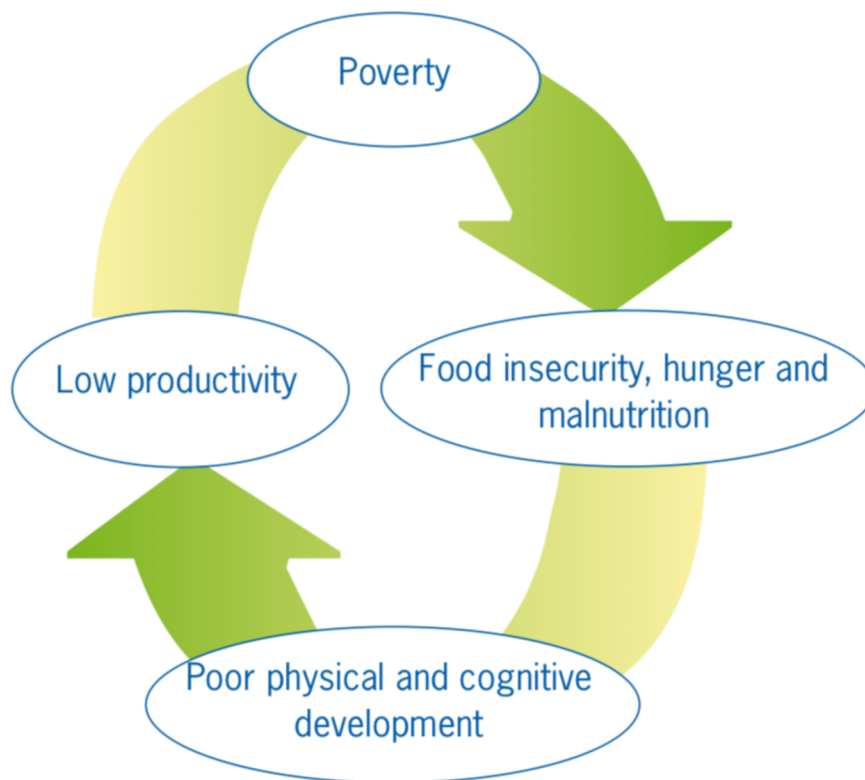


Figure 1. The Vicious Cycle of Poverty, Malnutrition, and Food Insecurity

Source: FAO 2008

4.1.2. Food Security Dimensions

Food security is determined through four interconnected dimensions: availability, access, utilisation, and stability. Availability entails having consistent access to sufficient, nutritious food, which goes beyond mere production to include transportation and exchange systems. Access involves the economic and physical means to obtain food, ensuring all household members meet their dietary needs. Utilisation focuses on the consumption of safe and nutritionally adequate foods, along with the ability to prepare and store them safely. Stability addresses the need for consistent food security over time, unaffected by seasonal changes, price fluctuations, or conflict, ensuring that food remains accessible, available, and usable sustainably (Ashby et al. 2016).

Availability, which, according to the World Food Summit (WFS) and further defined by the World Food Programme (WFP), involves having a sufficient amount of food present within a country or area. This encompasses all forms of domestic production, imports, food stocks, and aid. While ensuring an ample food supply is crucial, it alone does not guarantee food security; people also need actual access to this food (Ashby et al. 2016).

Access to food hinges on two main pillars: economic and physical. Economic access is influenced by factors like people's disposable income, food costs, and the availability of social support systems. On the other hand, physical access depends on the quality and availability of infrastructure, such as ports, roads, and storage facilities that enable (Ashby et al. 2016).

Utilisation is a complex aspect that involves various determinants influencing food quality and safety. These include health and hygiene practices, which are critical for determining how effectively the available food can be utilized. Utilization itself is a complex dimension, often assessed through anthropometric indicators for children under five, capturing aspects of undernutrition like wasting, stunting, and being underweight (Ashby et al. 2016).

Lastly, the concept of stability is crucial in food security, ensuring that the other three dimensions are consistently met over time, regardless of external shocks or disruptions. This stability is essential to continuously access sufficient, safe, and nutritious food for all (Simon 2012).

4.1.3. Measurements

The FAO (2023) determines two leading indicators to monitor hunger and food insecurity. The Prevalence of Undernourishment (PoU) and the Prevalence of moderate or severe food insecurity, measured by the Food Insecurity Experience Scale (FIES), are vital in tracking global progress towards Sustainable Development Goal 2 (SDG2). While PoU focuses on dietary energy intake adequacy using food availability and consumption data, reflecting global and regional hunger trends, the FIES assesses access to sufficient, safe, and nutritious food through direct surveys, offering insights into individual and household-level food insecurity severity. This dual approach offers comprehensive insights, shedding light on the multifaceted nature of food security. However, it also underscores certain limitations, such as the PoU's shortfall in identifying vulnerable populations within countries. Meanwhile, the FIES provides a detailed analysis of food insecurity's distribution and severity, a key aspect for explicitly targeting the Zero Hunger goal.

Figure 2. presents a FIES scale spectrum of food security scenarios, ranging from concerns about the adequacy of the food supply to actual experiences of missing meals. It begins with the anxiety of potentially not having enough to eat and extends to not consuming a diverse or preferred diet due to various constraints.

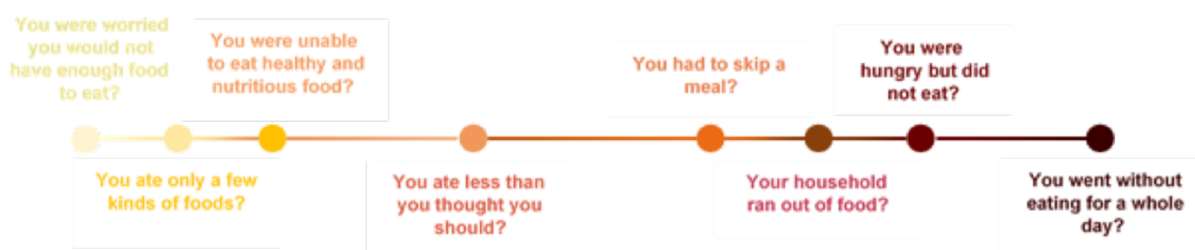


Figure 2. FIES Global reference scale

Source: FAO 2023

Figure 3 demonstrates global moderate and severe food insecurity percentages from 2015 to 2022. The graph has two bars indicating the severity of two problems: if the food insecurity is moderate, the bar is light orange; for severe cases, the bar measures dark orange. Overall, over the period observed, food insecurity has slightly increased, with a sharp escalation marking 2020. The figure confirms that, globally, food insecurity has been an issue over the years, particularly experiencing a spike during the COVID-19 pandemic.

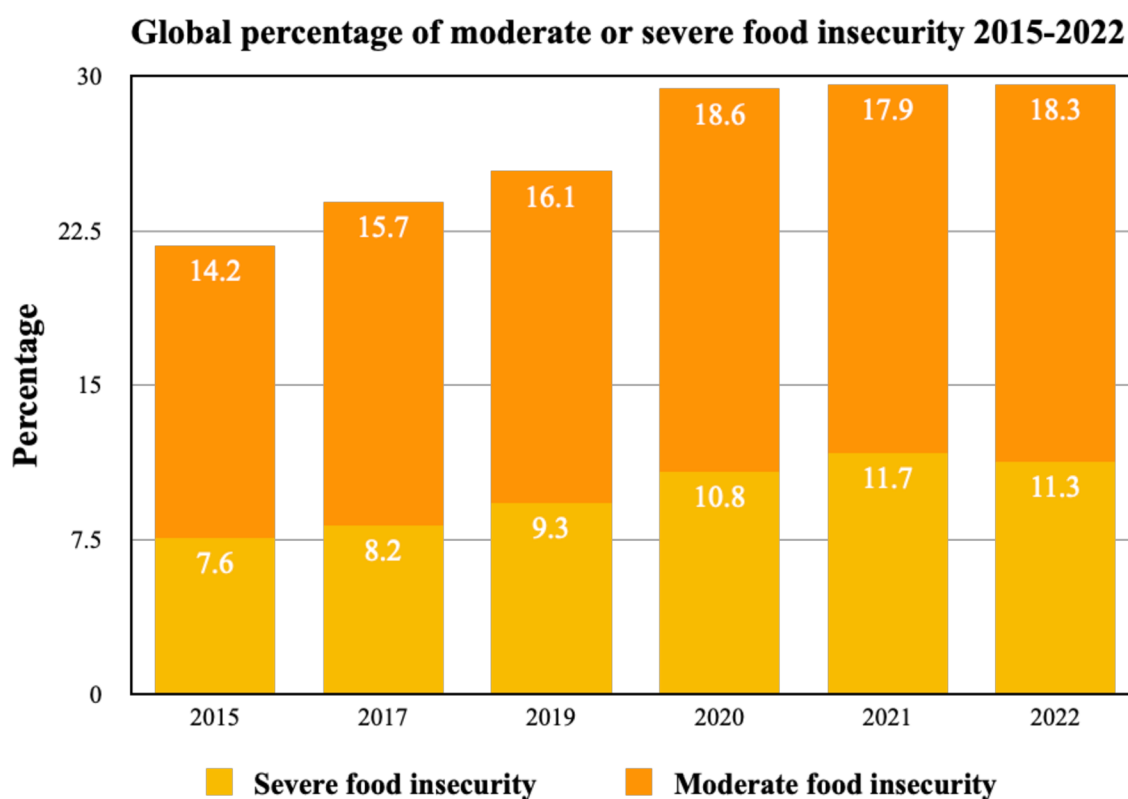


Figure 3. Global percentage of moderate or severe food insecurity 2021-2022

Source: FAO 2023

Achieving zero hunger is a crucial goal of the SDGs, but it remains a significant challenge worldwide. According to the United Nations, numerous indicators highlight the ongoing struggle with hunger. For instance, in 2017, approximately 821 million people were undernourished globally.

Sub-Saharan Africa continues to be the region most affected, with a hunger prevalence of 23.2 % in 2017, marking an increase of 2.5 % from 2014. Additionally, in 2018, about 149 million children under the age of five were chronically undernourished. The 2019 Global Hunger Index (GHI) points out that the most severe hunger levels, categorized as serious, alarming, or extremely alarming, are predominantly found in parts of Africa, India, and some Southeast Asian nations, emphasizing the critical need for focused efforts in these areas (Subramaniam et al. 2020).

4.2. Pre-COVID-19 Situation

When analyzing the field of agriculture before COVID-19, it is important to recognize the changes in agricultural practices over the past 10,000 years. From the beginning of cultivating food crops to the present day, the agricultural landscape was an extension of the Green Revolution. This approach emphasized increased production through the use of agrochemicals, high-yield crop varieties, and mechanization. The main goal was commercialization, catering to global demands and supplying raw materials for various industries. During this time, Transnational Agro Business Corporations (TNCs) exerted significant control over production farms in the global food market. Additionally, large-scale food processing companies monopolized the production of mostly unhealthy ultra-processed foods that were convenient but lacked nutritional value. These TNCs were supported by economically efficient food retail businesses that consumers were familiar with (González 2020).

The complex global economy allowed TNCs to easily enter developing nations or suburban communities, taking advantage of countries with limited economic and political power. This was achieved through incentives such as investments, job opportunities, loans, the availability of cheap imported goods, and infrastructure improvements. The consequences of these developments led to rapid urbanization, with urban populations surpassing rural populations. As a result, agricultural activities in affected countries shifted their focus towards meeting industrial demands, sacrificing self-sufficiency and relying heavily on imported food and raw materials (González 2020; Bull et al. 2021; Corcioli et al. 2022).

Agriculture in the pre-Covid era did not only provide benefits for the growers, but also for the food, and even need it later. In that era, the government always provides an understanding about food security from the dangers of scarcity. One form of understanding it is with organizing a national food day and provide advice to cook traditional food that are healthier, cleaner, and greener. National food day is an event that is eagerly awaited by citizens. The government, in this case, the Ministry of Agriculture, supports this event by providing various means to attract people. One that is by providing seedlings of fruits and vegetables for free. With a wide range of programs, increasing public awareness to consume food with healthier and safer. From the agriculture, the food needs of the people in this era have been fulfilled. In fact, there are so many surplus crops exported to other countries (Gadal 2020; Tansuchat 2022).

The prices of crops in the pre-Covid era are also promising. It encourages the growers to plant the crops again. In addition, the price also stabilises until the market demand for crops has decreased. Farming and growing crops in this era provide tremendous benefits for the growers. With good prices and market demand, the growers will be encouraged to intensify their farming, it will reduce unemployment, and the crops stock will not run out (Furbush et al. 2021).

Agriculture has always been an important part of the world. Many countries have made agriculture as their primary source for income. Various efforts throughout have been made to ensure the agricultural sector in a country can develop and make it as the main foundation in improving the economy. In pre-Covid-19 era, the agriculture sector showed a very good development. At that time, the grower can very easily distribute their crops to various regions or even to other countries. Crops distribution to other countries are not separated from the support of good government cooperation in terms of transportation access, shipping seed, and ease the permission for import and export goods (Hung 2021; Halimatussadiyah et al. 2022; Miao et al. 2024).

4.3. Impact of COVID-19 on Agriculture

On January 30, 2020, the World Health Organization (WHO) elevated their level of concern to the highest by declaring the coronavirus disease (COVID-19) a global public health emergency. By March 11, 2020, it was officially recognized as a pandemic.

COVID-19, the disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), manifests through symptoms such as a dry cough, fever, and in milder cases, nasal congestion, sore throat, loss of smell or taste, along with discolouration of the fingers and toes. In response, nations around the world implemented measures to mitigate the spread, including quarantines, lockdowns, isolation of the infected, travel bans, closure of borders, and the promotion of social distancing. Despite the intent to control the spread of the virus, these actions have adversely impacted the global economy, leading to a recession and financial crisis (Bochtis et al. 2020). The FAO highlights that the COVID-19 pandemic primarily impacts agriculture through food supply and demand disruptions. These disruptions pose a direct threat to food security (FAO 2020).

4.3.1. Agriculture Production

The disease had a significant impact on the world's economy. All sectors were impacted, including one of the most important ones—agriculture—because more than 60 % of the global population depends on it as a means of livelihood (Poudel et al. 2020).

Agriculture production is critical for food security and reducing poverty. However, the spread of disease brought many restrictions and bans, which caused significant disruptions in the agricultural supply chain. This led to limited access to necessary farm inputs and, consequently, lower production levels (Sridhal et al. 2023). Travel restrictions have significantly impacted the availability of migrant labour, leading to disruptions in agricultural activities such as harvesting. This reduced workforce has resulted in increased post-harvest losses and delayed fresh produce distribution to the intended markets (Mardones et al. 2020). Countries traditionally relying on seasonal migrant workers for crucial agricultural tasks have faced labour shortages, undermining the timely execution of activities like planting and harvesting. The challenges extend beyond just a scarcity of farm labour; critical elements such as logistics and transport services, essential for the functioning of agriculture, have also been significantly affected. Necessary inputs such as pesticides, fertilisers, and seeds have seen delays and shortages, throwing a wrench into the well-oiled machine of agricultural production. These disruptions ripple through the supply chain, leading to decreased labour productivity and elevating costs for labour and transportation.

For farmers, this translates into significant income losses, while for consumers, it means facing shortages and higher prices for perishable products. The intertwining of labour shortages and supply chain disruptions underlines a broader crisis in food security prompted by the pandemic's unparalleled global impacts (Bochtis et al., 2020).

In wealthier nations, cultivating primary crops like maize, wheat, and soybeans is predominantly automated, which naturally incorporates social distancing due to the minimal human labour required. The process from land preparation to harvesting relies heavily on sophisticated machinery, minimizing the need for physical labourers. Conversely, the production of non-staple foods such as fruits and vegetables is less amenable to mechanization due to the necessity of manual labour for tasks like planting, weeding, and harvesting, necessitating adaptations in work practices to mitigate disease spread. Strategies include implementing staggered shifts to prevent worker congregation. Movement restrictions on seasonal labourers, crucial to the harvest in regions like Europe, disrupt food production and threaten food security by limiting the earning potential of workers from less affluent countries (Laborde 2020).

In contrast, agricultural operations in less wealthy countries are predominantly labour-intensive. Activities like planting rice and harvesting staple crops often require workers to operate nearby. While the farming populations in these regions tend to be younger than their counterparts in more affluent countries, the comparatively weaker health infrastructures and pre-existing health conditions elevate the risk and impact of COVID-19, underscoring the complex challenges faced in balancing agricultural productivity with health safety measures (Laborde 2020).

A survey by Jaacks et al. (2022) comprised over 3,500 participants, including farm workers and farmers with minor to extensive land holdings in 20 states. Moreover, the agricultural supply chain was massively impacted by the COVID-19 pandemic. As a result, farmers were unable to sell their produce due to a decline in prices and strict travel restrictions enforced during lockdowns. Furthermore, over half of the participants reported problems procuring labour and imperative farming inputs such as fertilisers and pesticides. Consequently, most farmers were unable to seed their crops on time.

4.3.2. Food Supply Chain

The food supply chain represents a critical network that links agricultural production directly to consumers, encompassing a variety of stages, including manufacturing, packaging, distribution, and storage. The initial response to the pandemic, characterised by social distancing measures, led to a rush on supply centres, causing temporary shortages of certain items. However, the food supply has since found equilibrium, mainly due to concerted efforts to maintain essential operations vital for food security. The FAO has been instrumental in ensuring that food value chains remain uninterrupted amidst the challenges posed by the pandemic. Despite governmental restrictions affecting labour mobility within agricultural systems, the provision of essential goods has largely continued without significant disruption. International trade faced its own set of challenges, with border closures leading to initial interruptions. Nonetheless, the resumption of trade followed the establishment of health and safety protocols designed to prevent the virus's spread, indicating a stabilisation that hinges on ongoing global efforts to combat the pandemic (Siche 2020).

Figure 4. illustrates the direct and indirect impacts of COVID-19 on human health through a series of cascading effects within the economy and food systems. Central to this illustration is the pandemic itself, leading to lockdown restrictions that cause economic damage. This financial impact is shown to reduce household income and increase unemployment, which in turn leads to decreased food supply as a result of agricultural damage and labour shortages. The labour shortages contribute to decreased production, which, alongside economic factors, causes a rise in product prices. The culmination of these factors is depicted as leading to increased food insecurity, ultimately impacting human health. This diagram encapsulates the complex web of consequences unleashed by COVID-19, highlighting the interconnectedness of health, economic stability, and food security.

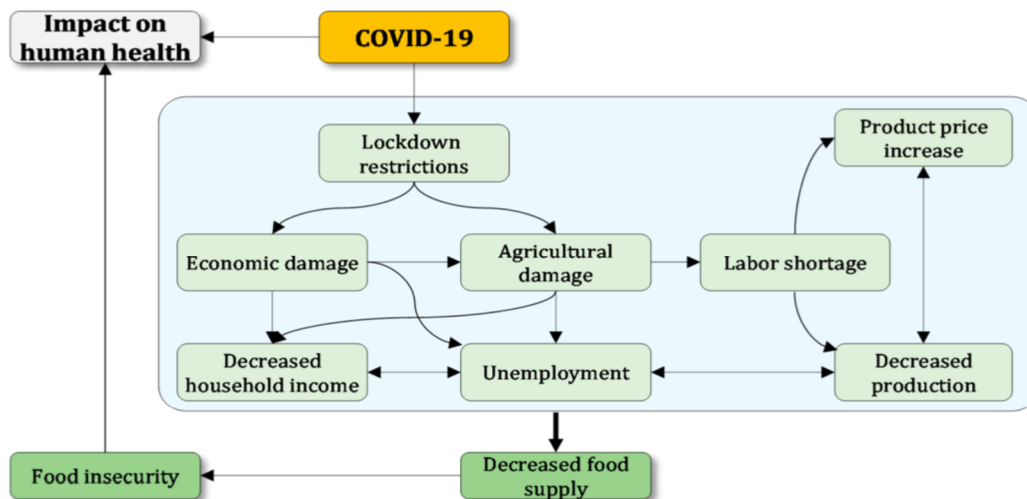


Figure 4. Direct and indirect impact of COVID-19 on human health

Source: Sustainability 2020

The pandemic has notably disrupted the supply chain for animal feed raw materials, mainly due to restrictions on animal movement, leaving farm animals without crucial components of their diets. Essential livestock farming materials and feed ingredients have become scarce, compounding the challenges faced by farmers in maintaining animal health and productivity. Additionally, veterinary healthcare services and other animal preventive health measures have seen significant reductions. This decrease in service availability extends to food safety inspections, animal health extension services, and disease surveillance efforts, which are critical for preventing the spread of zoonotic diseases and other infections. Such disruptions not only threaten the well-being of animals but also pose risks to human health, highlighting the intertwined nature of animal health services and the broader agricultural and food supply chains (Rahimi et al. 2022).

4.4. Food Prices and Affordability

Lockdown measures presented in response to the COVID-19 pandemic have upset food systems globally, shifting how and where nutritious foods are available and accessible (Jafri et al. 2021). In numerous countries, the ability to access food during the pandemic has significantly deteriorated (Kakaei et al. 2022).

Food access is directly affected by food prices, as high prices can limit the ability of individuals and families to purchase enough nutritious food, particularly in low-income communities and developing countries (Gustafson 2013). Due to the economic repercussions of the COVID-19 pandemic, the number of people unable to afford a healthy diet rose by 134 million from 2019 to nearly 3.1 billion in 2021 (42 % of the world's population) (Cui et al. 2023).

The World Bank (2023) summarized data on global changes in the cost of a healthy diet. The cost of maintaining a healthy diet has seen a noticeable uptick globally, with a 4.3 % increase in 2021 compared to 2020 and a 6.7 % increase from 2019. This trend is attributed to inflation spikes in 2020 and 2021, essentially a ripple effect of the COVID-19 pandemic.

On average, the daily cost of a healthy diet worldwide stood at \$3.66 per person when adjusted for purchasing power parity in 2021. However, this cost varied by region, with Latin America and the Caribbean experiencing the highest average cost at \$4.08, followed by Asia at \$3.90, then Africa at \$3.57, with Northern America, Europe, and Oceania having the lowest costs at \$3.22 and \$3.20 respectively. Particularly in Africa, Asia, Latin America and the Caribbean, the price for a healthy diet surged by over 5% from 2020 to 2021, impacting these regions adversely. The only exception was Northern Africa, which noticed a decrease in cost by 2.8 %. Meanwhile, Oceania faced a 5.2% rise, and Northern America and Europe saw a marginal increase of 0.6 % in the cost of a healthy diet during the same timeframe.

Figure 5. provides a comparative view of the increase in the number of people unable to afford a healthy diet between 2019 and 2021 across different global regions.

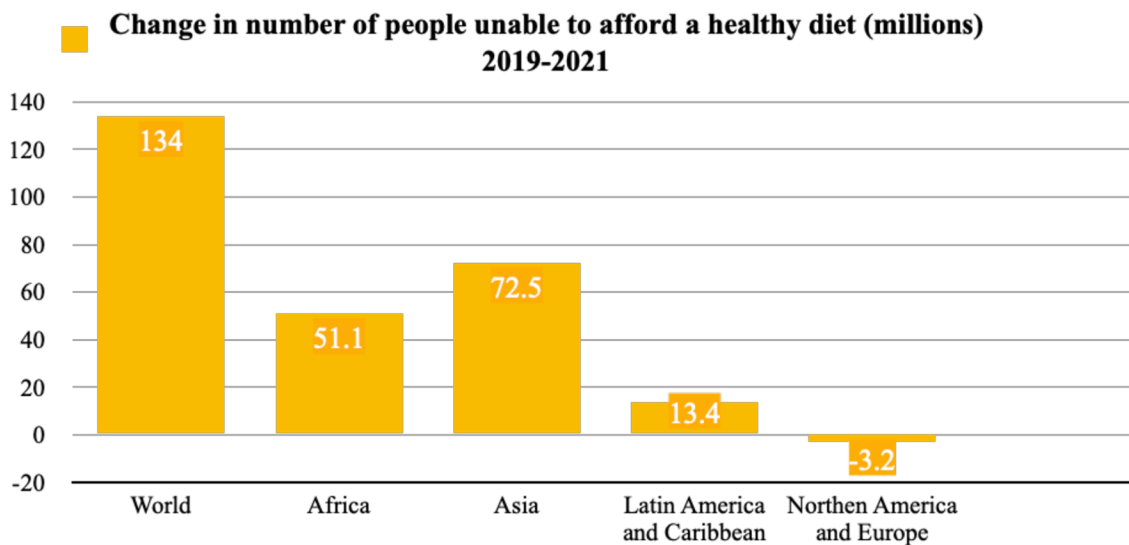


Figure 5. Change in the number of people unable to afford a healthy diet (millions)

Source: World Bank (2023)

4.5. Africa during COVID-19

Many countries across Africa have been dealing with economic recession, and the fallout from the pandemic has profoundly impacted the livelihoods and incomes of countless Africans. A significant number of the population lives below the poverty line, making them especially sensitive to food insecurity. Unfortunately, the advent of COVID-19 has only exacerbated these challenges, further complicating the efforts to improve the situation and secure basic necessities for those most vulnerable (Mohamed et al. 2021). For instance, in Africa, the average cost of a healthy diet increased by 5.6 % during the first year of the pandemic. The percentage of the African population unable to access a healthy diet was 77.5 % in 2021. On average, the most affected regions were Eastern and Western Africa, followed by Central Africa. In at least ten countries, this percentage was about 90 %, with Madagascar having the highest rate of 98 % (FAO 2023).

Table 1. shows the changes in the number of people unable to afford a healthy diet in millions across various regions of Africa from 2018 to 2021. It outlines year-over-year changes, with significant increases noted in some areas, particularly from 2019 to 2020.

	2018 to 2019	2019 to 2020	2020 to 2021
Africa	16	31.3	19.8
Central Africa	2.7	4.8	4
Eastern Africa	7.1	11.4	9.2
Northen Africa	-0.5	0.6	-3.4
Southern Africa	0.7	1.9	0.3
Western Africa	5.9	12.7	9.8

Table1. People unable to afford a healthy diet (millions)

Source: FAO 2023

4.5.1. Undernourishment

The Food and Agriculture Organization of the United Nations (FAO) uses an indicator of the prevalence of undernourishment to measure the number of people who might not be getting enough food. This measure is based on official data from countries about how much food is available, how much people are eating, and how much energy people need depending on factors like their age, gender, and activity level.

During the initial year of the COVID-19 pandemic, hunger rates spiked across various regions, setting off a concerning trend that persisted into 2022. Although the first year seemed to hit hardest in terms of hunger, the following year saw somewhat lesser increases in hunger levels in most places, except for Northern and Southern Africa. The ruthless hit was Central and Western Africa, where hunger surged by 2.8% and 2.7%, respectively, in 2020. However, by 2021 and into 2022, the rise in hunger rates slowed down, with changes in the PoU staying below or just around 1% in nearly all regions.

Figure 6. showcases the prevalence of undernourishment in Africa by subregion over a period from 2019 to 2022. The data indicate that undernourishment has been on an incline in regions like Eastern and Western Africa, where the percentages have significantly increased. In contrast, Northern Africa shows a decrease in undernourishment rates over the same period.

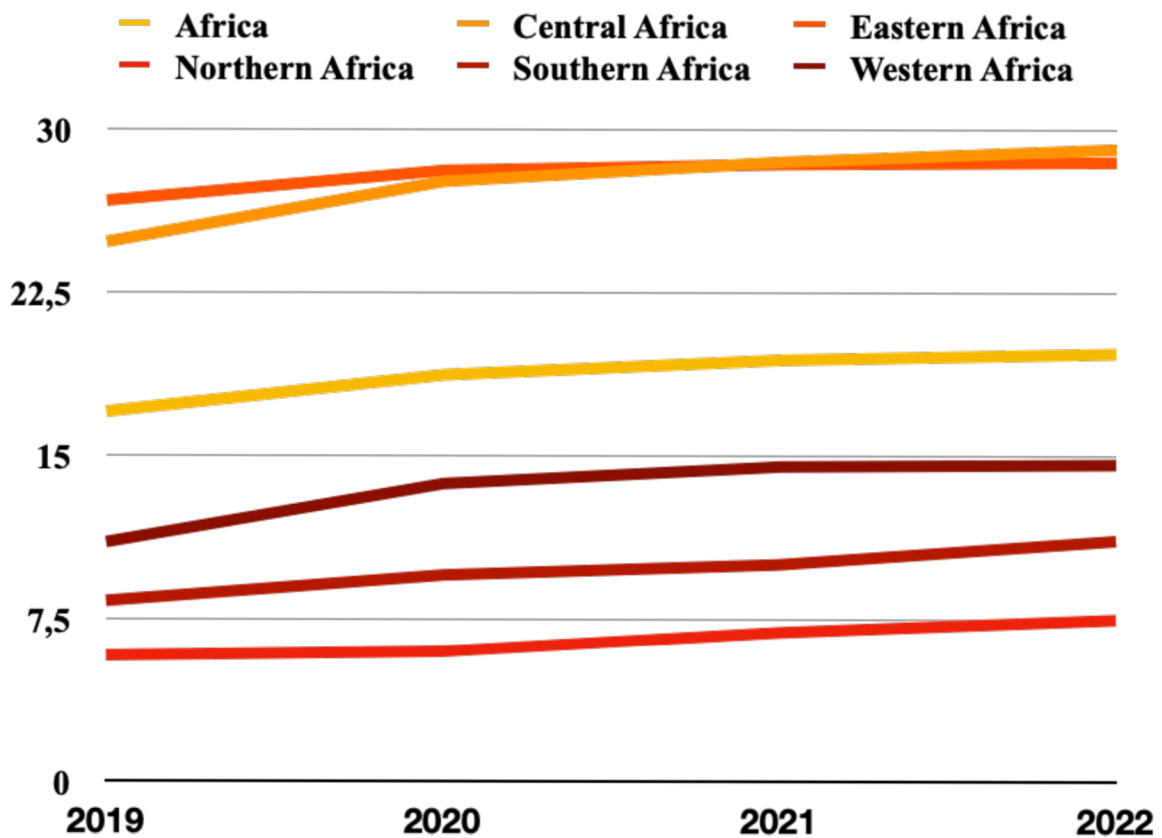


Figure 6. Prevalence of undernourishment in Africa by subregion (percentage)

Source: FAO 2023

4.6. Sub-Saharan Africa

Tabe-Ojong et al. (2023) review some studies of COVID-19 and food insecurity in Sub-Saharan countries with different measures, mainly using the FEIS scale. The studies showed that the impact of COVID-19 on food insecurity has varied widely across various countries, challenging initial assumptions about its effects on rural versus urban areas. Initially, it was thought that rural regions might suffer more due to their already existing high levels of food insecurity. However, the reality has proven more nuanced. In urban centres, where lockdown and containment measures were more rigorously enforced, households have faced significant challenges in accessing food. For example, studies in Mali showed that urban households experienced more food insecurity than their rural counterparts, effectively closing the rural-urban food insecurity gap. However, this was only the case in some of the places. In countries like Burkina Faso, Ethiopia, Malawi, and Nigeria, food insecurity increased more in rural areas.

Further research in Kenya, Zambia, Mali, Nigeria, and Senegal found that food insecurity levels in rural and urban areas were comparably affected. These variations highlight the importance of local context, including socio-economic conditions and government policies, in determining the pandemic's impact on food security. The timing of the pandemic—early versus several months in—also influenced these outcomes. With such diverse findings across different regions, it is clear that generalizing the pandemic's effects on food insecurity is difficult, underscoring the complex interplay of factors at work.

Table 2. presents variations in food insecurity across different households in selected countries before and during the COVID-19 epidemic. It shows a comparative analysis using the Food Insecurity Experience Scale (FIES) and other similar indicators.

Country	Pre-COVID-19	Post-COVID-19	Indicator
Nigeria	51 % (July/Aug 2018)	77% (June 2020)	FIES (Moderate and Severe Food Insecurity)
Kenya	50 %	88% (April 2020)	FIES (% of Food insecure Households)
Uganda	43 %	87% (April 2020)	FIES (% of Food insecure Households)
Mexico	31% (2018)	42% (May 2020)	ELCSA (Mild Food Insecurity)
Bangladesh	6% (2017-2019)	36% (May-June 2020)	HFIAS (Moderate Food Insecurity)

Table 2. Variations in food insecurity across different households in selected countries before and during the COVID-19 epidemic

Source: Picchioni et al. 2020

According to the statistics in 2019, 60% of children between six months and five years old in Sub-Saharan Africa suffered from anemia, mainly due to iron deficiency; hence, their intellectual development and general health were negatively affected. Furthermore, it was reported that 48% of children in the age group had a deficiency of vitamin A, which is quite a preponderant public health problem, leading to high deaths and blindness among children (Seifu & Tesema 2022). However, after the progress made in this direction, these food insecurities are accentuated by various systemic problems such as poverty, inadequate health infrastructure, and inadequate education. Such preexisting conditions, as evidenced by the extensive research done by FAO and the World Bank, present daunting challenges that necessitate a joint, strong-backed strategy to enhance the nutritional standards in the community. The above portrayal of the pre-COVID situation sets the platform for the extra tension that COVID-19 will put the

system through, emphasizing the need for continuous and innovative policy design to address food availability, access, as well as adequacy issues (Picchioni et al. 2022).

4.6.1 Nutritional outcomes

The COVID-19 pandemic has brought unprecedented challenges to global public health systems and economies. Beyond the immediate threat of the virus itself, the pandemic has also highlighted the importance of maintaining good nutritional health to support overall well-being and immune function. According to Rodriguez-Leyva and Pierce (2021), Vulnerable populations, such as low-income individuals, the elderly, and those with preexisting health conditions, have been particularly affected by disruptions to food access and nutrition programs. The long-term nutritional implications of the pandemic are yet to be fully understood, as it continues to impact dietary habits, food security, and mental health worldwide.

4.6.2 Pre-COVID-19 Nutritional Status and Food Security

Before the eruption of the COVID-19 pandemic, the world was faced with the problem of food and nutrition insecurity. This difficulty was more pronounced in Sub-Saharan Africa than in other regions (Picchioni et al. 2022). According to the State of Food Security and Nutrition in the World 2019 Report issued by the United Nations, it is estimated that up to 22.8% of the population in Africa is unable to access sufficient food, thereby making the region most affected and unearth the continent's struggle with chronic food deficiency (Nations et al. 2019). The dietary landscape became more frightening, with startling levels of malnutrition and micronutrient deficiencies. The Global Nutrition Report 2020 reported that one out of three children living in Sub-Saharan Africa were stunted, a sign of chronic undernutrition, while 7.1% of the children under five years of age in this region are wasted, which is a marker of acute undernutrition (Moseley & Battersby 2020). In addition, micronutrient deficiencies like 'hidden hunger' were a silent issue that had millions of affected victims, with the lack of iron and vitamin A, with iodine being the most frequent.

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4.6.3 Impact of COVID-19 on Nutritional Health

The long-term nutritional implications of the COVID-19 pandemic are multifaceted and complex, with potential consequences for public health, healthcare systems, and economies worldwide. Prolonged disruptions to food supply chains,

economic instability, and shifting dietary patterns may lead to persistent nutritional challenges in the post-pandemic era.

Chronic conditions such as obesity, diabetes, cardiovascular diseases, and mental health disorders are expected to rise due to the interplay of poor dietary choices, sedentary lifestyles, and psychosocial stressors induced by the pandemic. Addressing these long-term nutritional implications requires a comprehensive approach that integrates nutrition education, food security initiatives, healthcare services, and social support systems.

The COVID-19 pandemic propelled a globe-spanning shock that radically upgraded the fragility of global food systems, heightening the susceptibility to malnourishment and micronutrient deficiencies; thus, a significant relationship between COVID-19 pandemic and nutritional health (Rodriguez-Leyva and Pierce, 2021). Lockdown, social distancing rules, and a disruption of food supply chains resulted in a confrontation of food access and availability that was at a critical stage. In Sub-Saharan Africa, the nutrition health landscape was precarious as trade barriers and market closures led to a shortage of staple foods and vital nutrient-rich fresh vegetables. As evident in the 2021 Global Report on Food Crises, the pandemic led 9.2 million people to a more vulnerable position for food insecurity in Sub-Saharan Africa. A rise in malnutrition rates was particularly troubling; WFP stated that the number of young children suffering from wasting could increase by a shocking 14.3% due to COVID-19-related disruptions, which means over 6.7 million children are suffering from wasting.

Figure 7 is a conceptual diagram that depicts the interrelations between nutrition, COVID-19 infection, and overall human health.

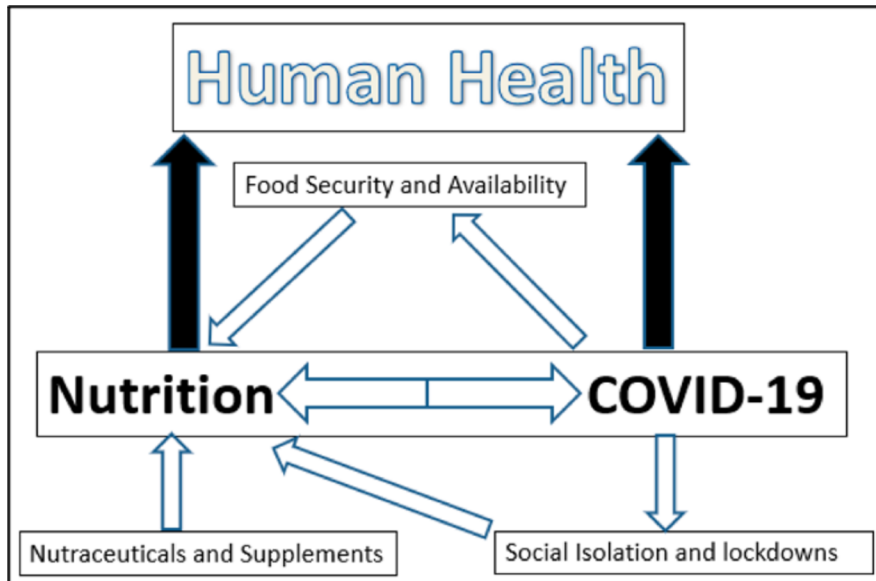


Figure 7. The relationship between COVID-19 infection and Nutrition

Source: Rodriguez-Leyva & Pierce 2021

Figure 8 delves into the factors influencing food insecurity and poverty among vulnerable populations during the COVID-19 epidemic. This diagram intricately maps the intersection of individual, family, and community levels with the broader social determinants of health, highlighting how each layer compounds the challenges faced during the pandemic.

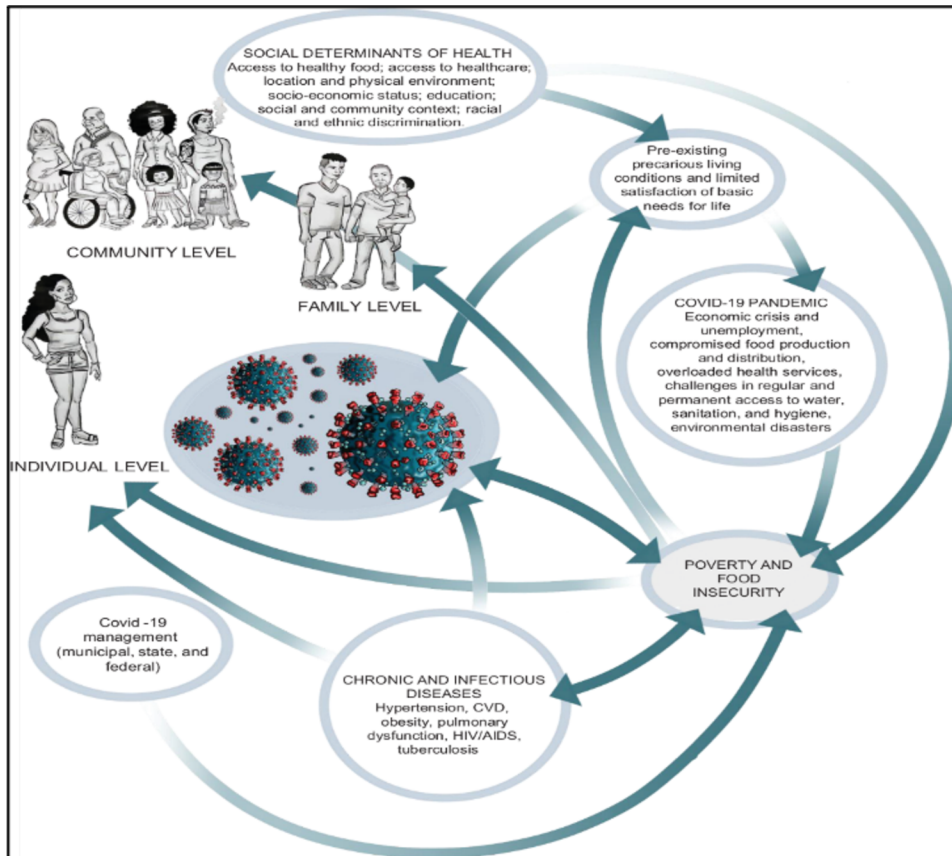


Figure 8. Factors influencing food insecurity and poverty in the COVID-19 epidemic among vulnerable populations.

Source: Rodriguez-Leyva & Pierce (2021)

This increase in malnutrition and micronutrient deficiencies is caused by supply-side constraints and demand, which are the distress factors. The supply side continued to experience logistic bottlenecks and food production disruption due to labor shortages. The crisis on the demand side was also triggered by reduced incomes and higher poverty levels across the continent, with the African Development Bank stating that the continent saw a decline in GDP of between 2.1% and 5.1% in 2020 (Bank 2019). All these heightened food affordability crises. A comparative study indicates a considerable difference between the nutritional impact of the pre-and current pandemic (Rodriguez-Leyva et al. 2021). While there was a decrease in malnourished children in Sub-Saharan Africa by 2 % from 2014 to 2019, the COVID-19 crisis is likely to reverse this trend, leaving years of work diluted in the process with a projection of 14.3 % increase of malnutrition in children (Aborode et al. 2021).

Marginalized groups such as refugees and IDPs in the process of already encountering hardships like inaccessibility to food and health services found their conditions still worsened when humanitarian aid delivery got disrupted. The World Bank pointed out that nearly 26% of the global refugee population, many of whom reside in Sub-Saharan Africa, were impacted by the disruption of aid and food programs, amongst other essential support services. These communities struggled tougher during the pandemic. High food prices, reduced buying power, and health system failure worsened the demographic nutrition crisis. In Sub-Saharan Africa, where economic resilience is scarce, the effects lead to an immediate nutritional crisis and a lost prospect of recovery post-COVID-19. Ensuring the right to food among these populations necessitates a personalized perspective, considering how food system complexity, economic well-being, and social safeguards interlock to create the paths to nutritional security (Bertinelli et al. 2022).

4.6.4 Vulnerable Populations

Vulnerable populations, including low-income families, marginalized communities, older adults, children, and individuals with chronic illnesses, have been disproportionately affected by the nutritional consequences of the COVID-19 pandemic. According to Wetherill (2018), food insecurity, defined as limited or uncertain access to adequate food, has worsened for many vulnerable groups due to job losses, income reductions, and disruptions to food assistance programs.

Children who rely on school meals for basic nutrition have faced food insecurity as schools closed during the pandemic. Older adults living alone or in care facilities have experienced social isolation and limited access to nutritious foods, increasing their risk of malnutrition and frailty. Individuals with underlying health conditions, such as diabetes, hypertension, and obesity, face higher susceptibility to severe COVID-19 outcomes when their nutritional status is compromised (Bellido & Pérez 2021).

The pandemic hardest hit vulnerable populations as the nutrition-related ill-effects impacted different groups to different extents: community, family, and individual (Pereira & Oliveira 2020). In Sub-Saharan Africa, three distinct groups surfaced as profoundly affected by worsening Nutrition: children aged five years and below, expectant and

nursing mothers, as well as vulnerable communities like refugees and internally displaced persons (IDPs) (UNICEF 2021). Children aged five and below are at the development stage, and the best nutrition level for them is essential. Existing challenges like high stunting and wasting were further affected by the pandemic, and Lancet Global Health forecasted this estimated that there would be an additional 6.7 million children with wasting, predominantly mainly in sub-Saharan Africa, resulting from the pandemic-induced lack of food. Pregnant and lactating women require increased micronutrients; the disruptions in healthcare and food systems also make maternal malnutrition worse than before, which affects the mortality rate of mothers and infants, besides the long-term well-being of mothers and their children; leading to a rise in malnutrition in pregnant women in Africa (Seid et al. 2023).

Figure 9 provides a visual representation of the varied levels of vulnerability to COVID-19 across the African continent.

Continental exposure

Covid-19 community vulnerability Index (CCVI)*, by region

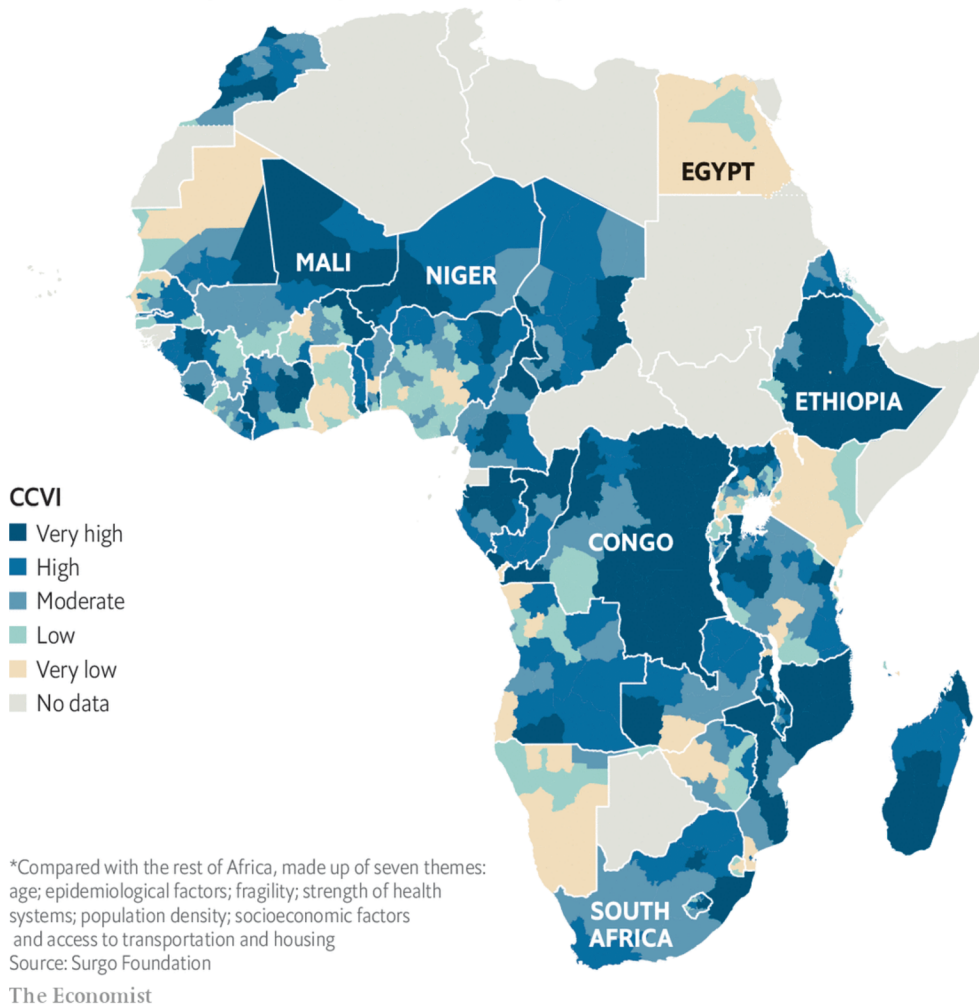


Figure 9. Which parts of Africa will be hit hardest by COVID-19?

Source: The Economist (2020)

4.6.1. Long-term Nutritional Implications

The COVID-19 pandemic has significantly impacted nutritional health on individual, community, and global levels. Lockdowns, quarantine measures, and disruptions to food supply chains have led to changes in dietary habits, including increased consumption of processed foods, sugary snacks, and alcohol (Yanovski and Socol 2022). Limited access to fresh fruits, vegetables, and other nutrient-dense foods has

contributed to micronutrient deficiencies and compromised immune function in many populations.

Moreover, stress, anxiety, and social isolation associated with the pandemic have influenced eating behaviours, leading to emotional eating, binge eating, and disordered eating patterns among some individuals. Inadequate physical activity due to restrictions on movement has further exacerbated the risk of weight gain, obesity, and related chronic diseases.

It is foreseen that the lasting nutritional consequences of COVID-19 will encompass not only the immediate crisis but also extend to the generations following as they might continue to impact Nutrition for a long. The results of modelling studies that have been published in journals such as "Nature Food," as well as those by the World Food Programme, reveal that the pandemic might affect the nutrition situation drastically and longevity, especially in areas like Sub-Saharan Africa, which were already in the region of nutritional deficiency before the onset of the pandemic. The expected food insecurity due to the economic downturn caused by COVID-19 leads to chronic conditions such as malnutrition, stunting, and wasting among children (Mohajan, 2022). These consequences bring about a decline in cognitive and physical development as well as an increased susceptibility of the children affected to non-communicable diseases during their already struggling life, which directs to more burden on rampant health systems. The Global Nutrition Report 2020 analysed the potential impact of the pandemic on the number of undernourished children, concluding that the crisis may push an additional 10 million children into hunger by 2030, increasing the global number of malnourished children to nearly 54 million (Global Nutrition Report 2022).

The generational effect of these nutritional setbacks is very complex. The early life nutrition deficit can lead to poor academic performance and reduced economic productivity. The so-called lock-in effect fears that the nutritionally deprived generation raises the next generation with similar deficiencies, which eventually continue the cycle of poverty and also malnutrition. Strategic and evidence-based measures must be introduced to avoid such a chain of adverse consequences. Efforts to boost agricultural productivity, fix food supply chains, and create social safety and networks are crucial. Policies must be visionary and proactive, treating visible distress and predicting the

downstream consequences by assisting the at-risk nutritional populations with resilience. An integrated plan combining short- and long-term relief programs should aim to boost the resilience of food systems against such shocks in the future (Manikas et al. 2022).

4.6.2. Case Studies

In analyzing the nutritional landscape that has changed due to COVID-19, it is relevant to consider several instances that affirm the complex nature of the impacts and the strategies that will be utilized. For example, in Kenya, the arrival of the pandemic coincided with the beginning of the harvest season, disrupting supply chains and increasing returns for farmers. A survey by Duressa et al. (2022) indicated that food waste at the household level could have increased by up to 30%, thereby impacting Nutrition by limiting the household food stock, especially fresh fruits, and vegetables which are rich in micronutrients. However, especially in Ethiopia, in this case, the government, in partnership with non-governmental organizations, broadened the Productive Safety Net Program during the pandemic to shield the most vulnerable from economic shocks. This plan proved effective because it granted a cash transfer and food relief to approximately 8 million people, as the World Bank reports, which helped avert a detrimental food crisis that could have worsened during the pandemic's peak (Webb et al. 2021).

As in the case of Nigeria, urban lockdowns, in many instances, resulted in more and more communities engaging in urban gardening and supporting community agriculture, as testified by the International Food Policy Research Institute. Part of the achievements of these local initiatives was to look into food supply disruptions, indicating the ability of urban agriculture to support food and nutritional security during such emergencies. These instances reveal key lessons: the crucial access and flexible food systems, the benefit of reactions from governments and communities, and the effectiveness of social protection initiatives (Agbugba et al. 2022).

4.7. Policy Responses

This section's literature analysis and evaluation focuses on Initial Policy Actions to Combat Food Insecurity, Sub-Saharan Africa: Policy Interventions and Efficacy, and Challenges and Opportunities.

4.7.1. Initial Policy Actions to Combat Food Insecurity

The quick and unexpected global and regional policies for the nutritional impacts of a pandemic were widely and differently implemented among countries. According to a study by Araujo and Calazan (2020), various developed and developing nations have faced unprecedented and unforeseen challenges regarding food security and health issues as far as the COVID-19 pandemic is concerned. Thus, based on the significant relationship between food security, health issues, and the pandemic, various governments, non-profit organizations, and international organizations have seen the urgent need to establish policies to address these issues. At the same time, multiple governments, non-profit organizations, and global organizations have established protocols, interventions, and approaches that fundamentally foster social protection, nutritional improvement, and food security interventions. A report published by Peters et al. (2022) has shown that these policies and interventions are vital in helping vulnerable communities adjust to the advent of health crises and food insecurity. In addition, non-profit organizations such as the FAO have established critical interventions and responses through various recovery programs to boost food security and sustainability among the vulnerable population affected by COVID-19.

Most importantly, some studies have opined that addressing food insecurity and malnutrition requires a multidisciplinary approach because of the significant health repercussions on the vulnerable population in contemporary society. According to survey reports, some critical policy interventions and actions, especially in the Sub-Saharan countries in Africa such as Ethiopia, have taken into consideration a significant amount of investment in agricultural activities such as the provision of adequate finances to the vulnerable communities to boost their farming practices; thus a boost in food security, and agricultural sustainability practices (Giller 2020). Also, some policy interventions have considered training education, the establishment of food delivery programs, and nutritional education, especially within healthcare, schools, and community geographical jurisdiction; thus, a significant boost in food security, hunger alleviation, poverty reduction, and eradication of malnutrition among the vulnerable population in the society such as the sick, children, and the elderly who are incredibly susceptible to unprecedented, and unpredicted societal health issues such as SARS, and the COVID-19 pandemic (World Health Organization 2021).

In some African nations such as Nigeria, Ethiopia, and South Africa, non-profit organizations, community groups, and government agencies have played a fundamental role in the establishment of food banks and the formulation of income support policies and initiatives to support the vulnerable populations who are significantly affected by the issue of food insecurity through community food programs (Bazerghi et al. 2016).

For instance, the application of COVID-19 prevention measurements in the Rio Grande do Norte food security program has taken into account various multifaceted approaches to address food insecurity such as emergency planning to reduce food insecurity among vulnerable populations (Araújo and Calazans 2020).

Figure 10 outlines the strategic application of COVID-19 prevention measures within the Rio Grande do Norte food security program. The figure breaks down the approach into three main components: Problem/Need, Emergency Planning, and Operational Support.

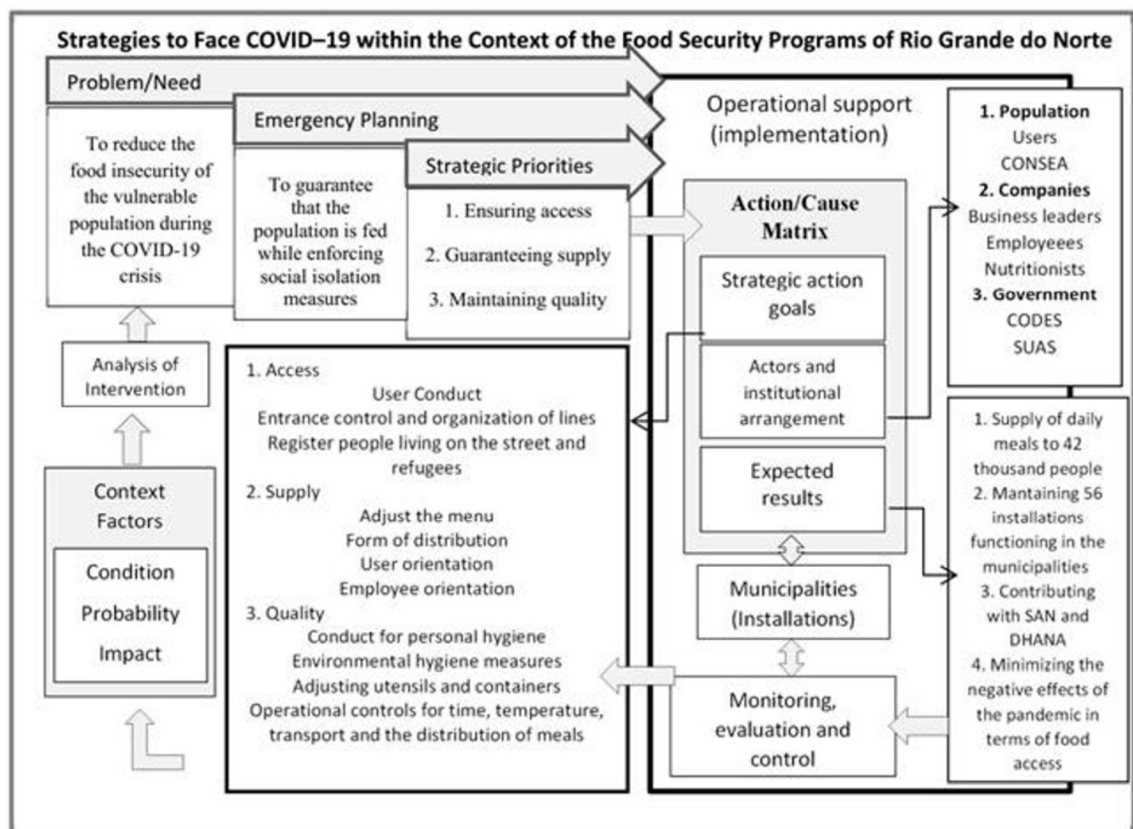


Figure 10. Application of COVID-19 prevention measurements in the Rio Grande do Norte food security program.

Source: Araújo & Calazans 2020

The urgent policy measures in sub-Saharan Africa for dealing with COVID-19-induced food insecurity were critical and challenging because the area already had ongoing vulnerabilities. The pandemic necessitated rapidly deploying emergency food aid and strengthening social protection measures. Following that, the African Union (AU) quickly developed the Joint Continental Strategy for COVID-19, which provided guidelines on how food security would be maintained during the pandemic. As a result, the AU allowed the free flow of food commodities across the continent even during the lockdowns, thus avoiding food shortages. Furthermore, the AU's COVID-19 Food Security and Nutrition Response plan aimed to ensure stable food prices and supply chains, which the pandemic had disrupted (Owie 2022).

On a national level, the governments of countries implemented different policy interventions. Likewise, through its Productive Safety Net Programme extension, Ethiopia has over 12 million people benefiting from essential food and cash transfers, as the World Bank reported. In Kenya, the government implemented cash transfer programs and food distribution initiatives for the people who live in the urban slums, the research of which was conducted by the Tegemeo Institute at Egerton University. In addition, the Emergency Food Production Facility that the African Development Bank developed was meant to help smallholder farmers prevent food shortages in the country, as documented in their 2020 report (Giller et al. 2021).

4.7.2. Sub-Saharan Africa: Policy Interventions and Efficacy

With the COVID-19 outbreak, action was taken in sub-Saharan Africa, among which were food and nutrition security-mitigating measures. These interventions, which differ in the width of their ambit and designs, dealt with the immediate and intermediate impacts of COVID-19 on food and agriculture; the analysis of these policies demonstrates the depth of multifaceted initiatives such as social safety nets and agricultural support schemes, each of which is diversified depending on the uniqueness of the countries involved. For instance, Ethiopia expanded its Productive Safety Net Programme, which was a course that put its legal social protection frameworks in light during the emergency (Gebresilassie 2019). This expansion had much significance, as estimated by the World Food Programme, in providing food and financial aid to over 20 million people.

This program's efficacy was apparent in its ability to build upon a formidable framework that allowed a timely intervention, making the situation more manageable and stagnating a deeper slide into food insecurity. For instance, nations such as Nigeria and South Africa have established emergency funds and agricultural approaches, interventions, and protocols to ease the burden of food insecurity among vulnerable populations such as small family households. Some of the initiatives concerning policy interventions include the supply of subsidized agricultural inputs such as seeds and fertilizers, according to Ngumbela et al. (2020). At the same time, some policy interventions among some Sub-Saharan nations in Africa have been in line with some sustainable development goals such as eradication of poverty and reduction of food insecurity; thus, a significant way of averting malnourishment, hunger, and food insecurity at the local, national, and regional level.

NGOs have been huge players in the support of governance agendas through their specific plans and creative solutions. For instance, the World Food Programme (WFP), while not a non-governmental organization (NGO), cooperates with governments and NGOs to deliver emergency food assistance. In Kenya, the NGO Food for Future partnered with the government during the distribution of food and hygiene kits to vulnerable families, utilizing its community networks to ensure aid gets to people in need through a swift process. Another example is the case of Action Against Hunger in South Sudan, where the NGO implemented community-based nutritional support programs such as therapeutic feeding for children who were severely malnourished (Ak, Mori & Amegovu 2020). The role of this first aid program was especially critical when the public health sector was overwhelmed or lacked services. In Nigeria, the International Committee of the Red Cross (ICRC) cooperated with government bodies to help internally displaced persons (IDPs) by deploying seeds and farming tools to improve food production. This campaign indicates the function of NGOs in providing food assistance beyond the disaster recovery and resilience process (Ak, Mori & Amegovu 2020).

4.7.3. Challenges and Opportunities

The crisis generated a new era of digital solutions for food distribution and social comfort, which proved the efficiency and the inclusiveness of technology-driven ways (Lajoie-O'Malley et al. 2020). For instance, mobile cash transfers empowered quick and

safe delivery of all aid to those who required help, thereby identifying a way forward to increase the social protection network in the future. Furthermore, the pandemic highlighted the significance of the local food production networks. The difficulties in global supply chains pointed out that the over-dependence on international food markets could interrupt the chains at any time. Such an understanding paves the way for various measures, such as those supporting sustainable agricultural practices, local food producers, and community-based food systems, which are less prone to global risk factors. Through its work, FAO points out that the success of those systems is not only in providing immediate food aid but also in developing long-term sustainability and self-sufficiency (Shaw 2001).

According to the studies by Agbugba et al. (2022), Araújo and Calazans (2020), Mahajan (2022), and Pereira and Oliveira (2020), the COVID-19 pandemic has posed a significant challenge concerning food security not only in Africa but globally. Most importantly, this has been attributed to the complexities surrounding food insecurity in the Sub-Saharan countries, such as but not limited to inequalities that exist with social structures, issues concerning unemployment, and a higher rate of poverty among vulnerable communities. Furthermore, Pereira and Oliveira (2020) claim that various governments have not showcased political goodwill to address the challenges associated with malnutrition, food insecurity, and poverty eradication attributed to poor policies concerning resource and project implementations. However, despite these challenges, existing literature has posited that there are still looming opportunities that can be tapped amid the issues and challenges associated with food insecurity and malnutrition (Golembeski et al. 2022). Some opportunities include establishing policies and interventions that foster partnerships and collaboration among various stakeholders such as non-profit organizations, private sectors, researchers, and the affected communities at the grassroots level. Also, there is a need to empower the affected and vulnerable communities by designing policies and interventions that foster social equity and inclusion regarding resource distribution (Golembeski et al. 2020).

5. Conclusions

The COVID-19 pandemic has left significant and lasting implications on global food and nutrition security, exposing, and amplifying current weaknesses, especially in Sub-Saharan Africa. This region recorded a sizable change of fortunes-deepening poverty and malnutrition trap from the outbreak. As feel demonstrated in this work the impact of the pandemic is universal, with considerable variance among regions, with resulting disparities in food protection and nutritional problems primarily dependent on standard economic and social predictors. In this work, the literature analysis has already highlighted the need to investigate how vulnerable the pandemic had indeed identified the critical vulnerabilities within the food supply chain. Labor shortages, disruptions in supply chain, and a more unhealthy eating pattern have emphasized the urgent need for firm, active, and equitable food systems. Policy exercise and combined initiatives have proven crucial in ensuring food and restoring justice to those who have lost everything in this system. As this paper made a point, the results discovered the dire need for sustainable, distributed, and individually secure methods for food security has success emerged conclusively advocating a well-rounded, available solution that shall expand the development of food systems. The study I planned recommends frequent tracking of the pandemic's evolving consequences and it is expected that the policy initiatives that have enacted would yield better results. Renewable enhanced enforcement in domestic farming methods, bolstering of social protection support, and promotion of local food processes capable of withstanding global tremors is necessary filthy. A concerted attempt to tie the breach between temporary relief and long-term strategic measures will help strengthen the country's food infrastructure, extend social support benefits and open the course to people's food accessible. A decent return to the status quo will be the investment, as it will draw us closer to Zero Hunger, is propagated as defined in the standards for sustainable growth and continues to reshape the area after a pandemic. The information presented in this thesis helps refine and include a nuanced understanding of the pandemic's diverse impacts, reusing the need for an integrated, multi-program strategy that prioritizes nutrition, even more critical in the era of global health crises.

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