
Decrypting the Effect of COVID-19 Pandemic on Food and Nutrition Security in Kenya

John Lokuruka Napoo^{*}, Simeon Pharis Ndwiga, Victor Musi Musitia

Learning and Development, Kenya School of Government, Nairobi, Kenya

Email address:

john.napoo@ksg.ac.ke (John Lokuruka Napoo), Pharis.Ndwiga@ksg.ac.ke (Simeon Pharis Ndwiga),

victor.musitia@ksg.ac.ke (Victor Musi Musitia)

^{*}Corresponding author

To cite this article:

John Lokuruka Napoo, Simeon Pharis Ndwiga, Victor Musi Musitia. Decrypting the Effect of COVID-19 Pandemic on Food and Nutrition Security in Kenya. *Journal of Food and Nutrition Sciences*. Vol. 11, No. 1, 2023, pp. 24-29. doi: 10.11648/j.jfns.20231101.14

Received: January 12, 2023; **Accepted:** February 8, 2023; **Published:** March 9, 2023

Abstract: Globally, there has been tremendous effort towards ending hunger and malnutrition in all its forms by the year 2030. These efforts have not realized the desired results due to conflicts within and without countries, climate variability and extremes, and economic slowdowns and downturns. In Kenya, food and nutrition insecurity existed even before the emergence of COVID-19 pandemic. With the occurrence of the pandemic, food systems and food supply chains relied upon by the population to access sufficient and affordable food of high nutritional value further worsened the already unfavorable situation. The gradual shocks and interruptions on food systems and food supply chains by the climate change, high poverty levels, income inequality, high cost of healthy diets, labor shortages coupled with global recession and pandemic containment measures required urgent attention and timely interventions to protect the vulnerable population. This view point paper provides an insight of the effect of COVID-19 pandemic on food and nutrition security, and the trends affecting food systems. The paper adopted descriptive approach which utilized an array of contemporary scholarly views and their research outputs on food and nutrition security which resonated with the Kenyan situation. The study findings emphasized on the need to adopt a multidisciplinary and multifaceted approach when addressing food and nutrition security even at the time of a pandemic in order to achieve the intent for the realization of the right to food of high nutritional value. The study revealed that Kenya should adopt diverse strategies for enhancing food and nutrition security, thus including crop diversification, crop bio-fortification, research on genomics and precision breeding, agroecology technique application, capacity building of extension workers, investing in climate smart agriculture and adoption of human centered design model to enhance resilient food systems. The findings will be vital to policy and decision-makers responsible for food and nutrition security.

Keywords: COVID-19, Decrypting, Food and Nutrition Security, Kenya

1. Introduction

The world's effort towards ending hunger and malnutrition in all its forms by 2030, has been frustrated by the various drivers (conflicts, climate variability and extremes, and economic slowdowns and downturns) of food and nutrition security. The situation worsened with emergence of the COVID-19 pandemic and its related containment measures exposing millions of people to food insecurity and different forms of malnutrition as they could not afford the cost of healthy diets [25]. "Food security exists when all people, at all times, have physical, social and economic access to

sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life" [5].

Approximately, between 720 and 811 million people in the world faced hunger which was an increase by 161 million people more than in 2019. Additionally, nearly 2.37 billion people in the world did not have access to adequate food in 2020, an increase of 320 million people in just one year [33].

Furthermore, the high cost of healthy diets, persistent high levels of poverty and income inequality continued to keep healthy diets out of reach for around 3 billion people in every region of the world [33]. This is in tandem with [17] assertion that, "food and nutrition insecurity is a daily experience in many parts of developing countries". In the

same vein, [34] revealed that an increase in the unaffordability of healthy diets was undoubtedly linked with higher levels of moderate or severe food insecurity.

Undoubtedly, for African countries, the outbreak of COVID-19 pandemic accelerated a decline in food production, thus affecting food and nutrition security. Nevertheless, it was not possible to fully quantify and ascertain the effect of the COVID-19 pandemic in 2020. However, as per [33], concerns were raised on the many millions of children under 5 years of age who were affected by stunting (149.2 million), wasting (45.4 million) or overweight (38.9 million).

Most developing countries were exposed to gradual supply shocks arising from their restricted access to transitional inputs and fixed capital [37]. Further, the pandemic exposed farming systems in the labor-intensive countries to labor shortages hence affecting access to food by the people [4, 37].

The pandemic increased the vulnerabilities of many households, consequently affecting food and nutrition security [3]. Its rapid spread from one region to another made several countries enact public health measures to protect their citizens from adverse effects [29]. The measures adopted which included cessation of movements at the international and local borders disrupted food supply chain [27].

Moreover, the consequential effect of the pandemic on food supply systems, poverty and nutrition was associated with a myriad of generalized economic setbacks and disruptions experienced in the agrifood supply chains [14, 31]. This ultimately lowered services in the hospitality industry, capacity to produce, and purchasing power (food trading and retailing) thus affecting general food production, distribution and access by the people [24].

2. Literature Review

2.1. Food and Nutrition Security Situation in Kenya

Kenya, like any other developing African country, experiences food and nutrition insecurity. Food being a universal human right due to its central role in human development, remained unfulfilled requirement for billions of people in the world [18]. Furthermore, whenever drought or famine occurs, approximately 2–3 million people are affected. The spread of COVID-19 exacerbated the situation of food and nutrition security in Kenya [27].

The IPC (Integrated Food Security Phase Classification) is “a set of tools and procedures to classify the severity and characteristics of acute food and nutrition crises as well as chronic food insecurity based on international standards” [35]. Similarly, the use of IPC, in reference to Acute Food Insecurity and Acute Malnutrition exists as “any manifestation of food insecurity or malnutrition found in a specific area at specified point in time of a severity that threatens lives or livelihoods, or both, regardless of the causes, context or duration” [35].

According to the situational analysis for Acute Food Insecurity for the month of February – March 2020, from the

analyzed population 1.3 million people faced Crisis (IPC Phase 3) or worse acute food insecurity, while 296,500 people faced Emergency (IPC Phase 4) in the Counties of Isiolo, Kilifi, Kwale, Mandera, Marsabit, Samburu, Turkana and Wajir [33]. In 19 out of the 23 Counties considered in the study, about 1,022,500 people encountered Crisis. The analysis for April-July 2020, 980,000 people were to face Crisis or worse acute food insecurity. In the counties of Kwale, Marsabit and Turkana about 112,500 people were to face Emergency [33].

Subsequently, the Counties of Meru, Taita Taveta and West Pokot were the most affected by acute food insecurity. In Meru and Taita Taveta, extensive destruction and forfeiture of livelihoods was due to flooding. Deaths and population displacement in West Pokot, were caused by heavy storms and landslides. This was as a result of prolonged and above average rainfall received in October-December 2020 [33].

Markedly, the livestock diseases epidemics were witnessed in 12 Counties, thus far including Baringo, Garissa, Embu, Isiolo, Samburu, Kajiado, Narok, Kitui, Taita Taveta, Tana River, Meru and Wajir thus considerably reducing livestock production [33]. In December 2019, the Counties of Baringo, Turkana, Embu, Tharaka Nithi, Samburu, Makueni, Marsabit, Mandera, Wajir, Isiolo, Garissa, Kitui, Tana River, Kajiado, Makueni and Meru experienced desert locust attack which mainly affected crops, pasture and browse [33].

According to the situational analysis for Acute Food Insecurity dated February – March 2020, the extent of destruction by desert locusts on the livelihoods was negligible and limited since most of the crops planted had been harvested or attained stage of maturity [33]. This implied that accumulative flooding effects associated with displacements of population, desert locust invasion and epidemics of livestock diseases steered acute food insecurity.

Food security severity varies from region to region, mainly due to rain patterns. It is more severe in the arid regions largely occupied by pastoralists, and minimal or none in the none-arid zones. The Analysis for Acute Food Insecurity and Acute Malnutrition for July 2021 - January 2022, and between July 2021 and October 2021, about 2.1 million people in Arid and Semi-Arid Lands experienced worse acute food insecurity. This implied that an increase of 34 percent or more than 700,000 people were to be classified in Crisis and Emergency compared to similar period in 2020 [34].

Consequently, out of the total population of 15 million Kenyans analyzed, over 3.5 million people were projected to encounter worse acute food insecurity (IPC Phase 3 or above) between February and June 2022 [35]. In comparison to similar period in 2021, people classified in IPC Phase 3 (Crisis) and IPC Phase 4 (Emergency) increased from 1.4 million to 3.1 million [35]. Food insecurity worsened due to prolonged dry spells from the below average performance of the short rains in November – December 2021, deplorable performance in crop and livestock production as a result of late rains, localized resource based conflict coupled with COVID-19 pandemic ripple effects which contributed to an

increase of prices for food items in the entire country [35].

As the pandemic intensified, resources were diverted to take care of the sick, movements (people and goods) were restricted and markets disrupted (volume and prices of food) adversely affecting food security [7]. In addition to these measures, the enforcement of social and physical distancing limited the communal performance of agricultural activities and availability of casual labor opportunities, reducing the amount of land cultivated and projected crop production [6].

Concerning nutrition insecurity, Kenya being among the developing countries in Africa is a victim of the situation. The analysis conducted for Acute Malnutrition (AMN) in July-August 2021 showed that the nutritional position for Kenya was critical in many arid and semi-arid areas affecting mainly women and children. About 652,960 children aged 6-59 months and 96,480 pregnant and lactating women required treatment for acute malnutrition. Due to COVID-19 pandemic, the caseload for children aged 6 to 59 months required urgent attention [34].

Acute Malnutrition condition further worsened for the period February – May 2022 likened to the analysis for August 2021, with most arid and semi-arid areas in Critical state (IPC AMN Phase 4). This was due to deteriorating food insecurity, high morbidity and poor sanitation and hygiene practices [35]. About 755,000 (16% increase from 653,000 in August 2021) children in Kenya below five years were likely to suffer from acute malnutrition during the entire period of 2022 compared to August 2021, and were in need of urgent treatment [35].

Furthermore, almost 103,000 (7% increase) pregnant and lactating women were affected by acute malnutrition and thus required treatment. The acute malnutrition was as a result of the cumulative effects of three failed rainfall seasons, inadequate health services, poor water, sanitation and hygiene, and poor childcare practices [35].

2.2. Food Supply Chain Disruptions in Kenya

The combined effects of COVID-19 pandemic, corresponding mitigation measures and emerging global recession could, without large-scale coordinated action, disrupt the functioning of food systems [36]. The pandemic affected health and nutrition by disrupting food supply chains caused by the implementation of far-reaching public health protection measures for addressing its spread [32]. [20], as cited by [30], conceived supply chain disruption in terms of any unforeseen change either local or global that negatively impacts that chain. Further, [20] as cited by [30] reaffirmed that the production and marketing of goods was immensely affected by the innumerable challenges brought by restrictions of movement.

The Government of Kenya in her effort to curb the spread of the pandemic, adopted several strategies thus far, including: the closure of bars, outdoor markets, restaurants and borders, imposed dawn to dusk curfew, and a ban on international travel with an exception of cargo [2]. The mitigation measures disrupted the local food systems in

various ways, making it difficult to meet shifting consumer preferences as well as disrupting the supply networks leaving much of the population food insecure, in terms of both food quantity and quality. “Quality encompasses not only physical fitness for purpose of the food item, but its safety and acceptability to the consumer” [19].

In concurrence with [2, 7] noted that, the collapse of the supply chain interrupted the delivery of goods and services [8, 10]. Consequently, Kenya, not only witnessed a major disruption to food supply chain in the wake of lockdowns, triggered by the global health crisis and economic slowdown. The crisis resulted in lower incomes and higher prices of food, putting food out of reach for many, undermining the right to food and stalling efforts to achieve the Second Sustainable Development Goal (SDG 2): “Zero hunger.” [11].

Food supply chain disruptions mainly affected the supply and availability of food, and demand and access to food.

i. Supply and Availability of Food

There was a shortage of workers due to cessation of movement, reduction of the carrying capacity of public vehicles, quarantine restrictions or infections. Such policies significantly affected supplies (production) of food [38]. The reduced sales as a result of widespread closure of retail and sales outlets and reduced operation hours due to curfews, destabilized cash flows [7]. The productivity and efficiency of employees was lowered due to problems encountered as they report to work and getting back home [7].

The closure of markets in an effort to control crowding, increased the risk of spreading the pandemic thereby disrupting food supply chains [16]. Food supply was also affected by the closure of agribusinesses as farmers could not access important farm inputs [15].

Additionally, COVID-19 testing regimes at the borders caused transport bottlenecks, leading to delayed delivery of agrifood commodities and inputs. The farmers with intentions of profiting from bulk sales could not, as they had lost connections with their off-takers and lacked access to current information or lacked transportation support [7].

ii. Demand and Access to Food

The mitigation measures employed to manage COVID-19 pandemic, stifled demand for food due to job losses. Access to food was mostly affected by the COVID-19 crisis. Poor spending on food by households reduced as income declined at the peak of the pandemic. Food price rise, directly affected households’ ability to purchase adequate food [21].

At the domestic level, income losses by households and the closure of restaurants, and entertainment venues [25], employees in private enterprises either lost their jobs or had to cope with pay cuts [13], and the number of employed persons in Kenya fell by 5.7 percent [25].

Lack of food was an issue for about 1 in 3 households and 28% of adult household members skipped at least one meal [7]. Market access was affected by the cessation of movement across counties as well as reduced working hours due to night curfews, and consumers in low-income had reduced purchasing power [7].

3. Statement of the Problem

Food and nutrition security has been a global concern even before the COVID-19 pandemic. About 821 million people globally were undernourished and had poor nutrition causing nearly 45% of the deaths of children under five years [12]. Various actors adopted initiatives aimed at ensuring the population has consistent and equitable access to healthy, safe, affordable food essential to optimal health and well-being. With other factors held constant, the initiatives to some extent reduced the severity of food and nutrition insecurity. This is in tandem with [28], Article 43 (1) (c) on Social and Economic Rights aspiration that states 'every person has a right to be free from hunger, and to have adequate food of acceptable quality'.

Even though The Vision 2030, The Kenya Agricultural Sector Development Strategy 2010 and Agricultural Sector Medium Term Investment Plans continue guiding in priority setting and resource allocation, budgets consideration and allocation have been skewed towards promoting agricultural commercialization and farming for export at the expense of the arid and semi-arid agro-ecological zones which are more deficient in food and nutrition [26].

The number of people suffering from hunger globally increased and the situation was exacerbated by the COVID-19 pandemic. The pandemic and containment measures restricted movements and disrupted markets thereby affecting food systems and food supply chains which in turn made the population more vulnerable to food and nutrition insecurity [12].

Feeding people is a primary objective of Government as a fulfilment of a part of national sovereignty. As much as Government of Kenya is committed to the realization of food and nutrition security policy objective of building capacity and ensuring the availability of quality and timely nutritious food [9], a proportion of the population still experiences food inadequacy, inaccessibility and unavailability besides being of low nutritional value. The government strategy for the management of integrated food and nutrition security has not fully realized the desired results [26].

This paper seeks to unravel the effect of COVID-19 pandemic on Food and Nutrition Security in Kenya with the view of developing strategies for achieving access and sustainable food and nutrition security.

4. Justification for the Study

The COVID-19 pandemic as a global health and humanitarian concern subjected millions of people's food security and nutrition at risk. Its combined consequences, mitigation efforts and global recession, disrupted food systems which necessitated a need for a large-scale coordinated course of action. Such a disruption might have far-reaching health and nutrition repercussions that have not been witnessed in more than half a century [36].

This paper provides an insight of the effect of COVID-19 pandemic on food and nutrition security, and in-depth review

of the main trends affecting food systems. The review is crucial for decision-makers in the ministries responsible for food security and nutrition to consider in their efforts to mitigate the economic repercussions of the pandemic.

5. Discussion

Food and nutrition security exists when all people have access to enough, safe, and nutritious food that fulfills their food preferences and dietary needs for a healthy existence at all times [5]. Numerous aspects of food security must be considered, thus far including, the availability of adequate and nutritious food, access to food, and the food system's resilience to environmental, market, and other sorts of shocks with the COVID-19 pandemic included.

Kenya's food policies give priority to agricultural productivity and yields over other equally vital factors such as access and sustainability. This has restricted the prioritization of food crops to only a few and has promoted the use of traditional agricultural methods that heavily rely on inputs such as artificial fertilizers and agro-chemicals, which have negative consequences for soils, ecosystems, biodiversity, and human health [26].

The reliance on a few traditional crops has made majority of Kenyans to be more vulnerable and impoverished. Simple logic and democratic principles suggest that policies reflect and meet the needs of the poor and disadvantaged. However, the implementation of the policies have not realized the intended goal. The policies are nothing more than declarations of intent. The good policies will remain good intentions if they are not executed [26]. As proposed by [23], the alteration of formal seed systems through introduction of quality declared seed programs, with a view to accommodate the plurality of seed systems and recognize diversity of use within crops, would increase the quality of seeds available to farmers and spur local seed businesses.

The majority of small-scale farmers in Kenya rely on the informal seed sector which includes self-saved seeds, neighbor exchanges, and local seed marketplaces. The country's seed laws and regulations, on the other hand, do not recognize or criminalize the informal seed business. Uncertified seeds, especially traditional seeds, are unlawful to sell in local markets [22].

The local crop types conserved and used through informal seed systems, provide a wealth of crop genetic variety and are recognized as crucial for climate change adaptation. This is in tandem with [1] view of the informal seed system, defined as the total of farmers' seed production, selection and seed exchange activities.

Small-scale farmers understand how to produce enough food sustainably, but the economic and political laws that control their food system frequently work against them. As noted by [23], the seed quality management procedures in Kenya are designed for formal seed systems only. They do not allow flexibility to accommodate the functioning of other seed systems [23]. This implies that, the elite and corporate interests' have control over the food system and policy.

6. Implications and Sustainability Measures

i. Limited budgetary allocation to agriculture

Insufficient budget allocation to agriculture greatly contributes to the current food crisis in Kenya. Many governments experience a challenge to increase a budget to invest in Agrifood systems [35]. To successfully realize reduced starvation, the Government should give priority to agriculture in budget allocation.

ii. Underinvestment in rural infrastructure by Government and private sector

Stagnation and low production of food in high potential areas is due to low levels of investment in rural infrastructure. Rural roads that are not developed or missing frustrate farmers' effort to access markets and transport products from production to consumption centers in urban areas. To achieve sustainable development, it is prudent to build and improve rural infrastructure.

iii. Unorthodox use of natural resources

Unconventional use of forests and soils immensely contributes to climate change resulting in prolonged droughts and floods in some parts of the country with adverse effects such as decreased food production, death of livestock and humans as a result of lack of food, pasture and water. The government should promote prudent and sustainable natural resource utilization by providing incentives that can enhance crop productivity and expand tree cover.

7. Conclusion

The COVID-19 pandemic had a damaging effect on food and nutrition security by threatening its access and sustainability. To mitigate this, there was a need for a multidisciplinary and multifaceted approach for developing strategies of addressing food and nutrition insecurity even at the time of a pandemic in support of the full implementation of the food and nutrition policy, established with the intent to provide a robust and inclusive framework for the realization of the Right to Food [9].

8. Recommendations

- i. Adopt Crop bio-fortification technique to improve the dietary quality of the population. Crop bio-fortification involves developing a crop which contains edible bioavailable micronutrients.
- ii. Adopt Crop diversification in the existing farming or cropping system to broaden the base of the system through the introduction of more crops and the application of efficient management practices to improve dietary diversity and food production.
- iii. Adopt the Agroecology technique to transform food system that is diversified, resilient, inclusive and sustainable. The principle of agroecology promotes local, stable and diverse diets with continuous integrated production of healthy and nutritious foods.

- iv. Adopt human centered design model to create products and services that resonate and tailored to consumers' needs thereby making food systems more resilient.
- v. Conduct research on genomics and precision breeding to aid in developing organisms with positive traits that will enhance productivity, nutrition and quality of produce.
- vi. Build and enhance the capacity of Agricultural Extension officers and technicians working on agriculture, nutrition and markets to adopt social communication approach for behavior change among the people, to promote understandability of food diversity and nutrition.
- vii. Heavily invest in Climate Smart Agriculture project to build resilience to climate-change risks and increase productivity in agriculture.

References

- [1] Almekinders, C. J. M., & Louwaars, N. P. (1999). *Farmers' seed production: New approaches and practices*. London, Intermediate Technology Publications.
- [2] Barasa, E., Kazungu, J., Orangi, S., Kabia, E., Ogero, M., and Kadondi, K. (2021). Indirect Health Effects of the COVID-19 Pandemic in Kenya: A mixed methods assessment. *BMC Health Services Research*.
- [3] Bironga, H. C., Keyombe, J. L. A., Aura, C. M., and Odoli, C. O. (2022). Unmasking the Impact of COVID-19 on the Livelihood of Small Scale Fishers along the Kenyan Coast for Possible Interventions. *Kenya Aquatica Scientific Journal of the Kenya Marine and Fisheries Research Institute*, Vol. 7, No. 1, pp. 6-12.
- [4] Chei, B., Gloria, E., Millicent, A. A., Isaac, C. O., et al. (2021). "Impact of COVID-19 on Poverty and Living Standards in Ghana: A micro-perspective", *Cogent Economics and Finance*.
- [5] FAO (2006). *Policy Brief. Food Security Issue 2*.
- [6] FAO. (2017). *The Future of Food and Agriculture: Trends and Challenges*. Rome.
- [7] Global Alliance for Improved Nutrition (GAIN). (2021). *Impact of COVID-19 on Kenya's Food Systems*.
- [8] Golan, M. S., Jernegan, L. H., and Linkov, I. (2020). Trends and Applications of Resilience Analytics in Supply Chain Modeling: Systematic Literature Review in the Context of the COVID-19 Pandemic. *Environment Systems and Decisions*.
- [9] Government of Kenya. *National Food and Nutrition Security Policy*, 2011.
- [10] Govindan, K., Mina, H., and Alavi, B. (2020). A Decision Support System for Demand Management in Healthcare Supply Chains Considering the Epidemic Outbreaks: A Case Study of Coronavirus Disease 2019 (COVID-19). *Transportation Research Part E: Logistics and Transportation*, 138, 101967.
- [11] HLPE issues paper 2020 - Impacts of COVID-19 on Food Security and Nutrition: Developing Effective Policy Responses to Address the Hunger and Malnutrition Pandemic.

- [12] HLPE Report 15 Food Security and Nutrition: Building a Global Narrative towards 2030.
- [13] Huho, J. M. (2020). The Two Sides of COVID-19 in Kenya: Getting a Closer Look. *International Journal of Scientific and Research Publications (IJSRP)*. Volume 10 (8).
- [14] Jose, G. C., and Manuel, A. H. (2022). "The Unintended Consequences of Confinement: Evidence from the Rural Area in Guatemala". *Journal of Economic Psychology*.
- [15] Keniyo, R. L. (2021). Impacts of COVID-19 on Agricultural and Food Systems in Kenya.
- [16] Kinuthia, K. M., & Susanti, E. (2021). COVID-19 Containment Measures of the Government of Kenya: Impact on Food Security and Farmers' Socio-economic Life.
- [17] Lokuruka, M. N. I. (2020a). An Overview of Food and Nutrition Security Situation of Kenya. *Journal of Food and Nutritional Sciences Research (JFNSR)*, Volume 2 (1), pp. 112-129.
- [18] Lokuruka, M. N. I. (2020b). Food and Nutrition Security in East Africa (Kenya, Uganda and Tanzania): Status, Challenges and Prospects. In Book: *Food Security in Africa [Working Title]*. London Intech Open Publishers.
- [19] Lokuruka, M. N. I. (2002). *Quality and Food Safety Assurance in the Fish Industry*, Amu Press, Nakuru, Kenya.
- [20] Meyer, S. (2020). "Combatting Ecommerce Supply Chain Disruptions and Steps You Can Take to Minimize Impact". *Big Commerce*.
- [21] Moseley, W. G., and Battersby, J. (2020). The Vulnerability and Resilience of African Food Systems, *Food Security and Nutrition in the Context of the COVID-19 Pandemic*. *African Studies Review*, Volume 63, Issue 3, pp. 449-461. Cambridge University Press.
- [22] Muthoni, J., and Nyamongo, D. O. (2008). Seed Systems in Kenya and Their Relationship to On-Farm Conservation of Food Crops. *Journal of New Seeds*, Vol. 9 (4) pp. 330-342.
- [23] Munyi, P., and Jonge, D. B. (2015). Seed Systems Support in Kenya: Consideration for an Integrated Seed Sector Development Approach. *Journal of Sustainable Development*; Vol. 8, No. 2. Canadian Center of Science and Education.
- [24] OECD. (2020). *Food Supply Chains and COVID-19: Impacts and Policy Lessons*.
- [25] Onsomu, E., Munga, B., and Nyabaro, V. (2021). The Impact of COVID-19 on Industries without Smokestacks in Kenya: The Case of Horticulture, ICT and Tourism Sectors. AGI Working Paper No. 35. Africa Growth Initiative at Brookings.
- [26] Oulu, M. (2021). What Ails Kenya's Food System? A Policy Perspective. *Food Law and Politics*. Route to Food.
- [27] Pinchoff, J., Austrian, K., Rajshekhar, N., Abuya, T., Kangwana, B., Ochako, R., Tidwell, J. B., Mwanga, D., Muluve, E., Mbushi, F., Nzioki, M., Ngo, D. T. (2021). Gendered Economic, Social and Health Effects of the COVID-19 Pandemic and Mitigation Policies in Kenya: Evidence from a Prospective Cohort Survey in Nairobi Informal Settlements. *BMJ Global Health*.
- [28] Republic of Kenya (2010). *The Constitution of Kenya*. National Council for Law Reporting, Nairobi.
- [29] Salma, H. Z., Rahimi, A. R., Muhammad, A. F., and Lijana, M. Y. (2022). "Government Pandemic Response Strategies for AEC Enterprises: Lessons from COVID-19". *Journal of Engineering, Design and Technology*.
- [30] Saugat, K., Padam, B. P., Jeevan, L., and Alagathurai, A. (2020). Food Supply Chain Disruptions and Resilience under the Stress of COVID-19: Evidence from Nepal. *Acta Scientific Agriculture*, Volume 4, Issue 7, pp. 158-166.
- [31] Swinnen, J., and Vos, R. (2021). COVID-19 and Impacts on Global Food Systems and Household Welfare: Introduction to a Special Issue. *Agricultural Economics (United Kingdom)*, 52 (3).
- [32] Tarek, B. H., and Hamid, E. B. (2022). "Impacts of the COVID-19 Pandemic on Food Security and Food Consumption: Preliminary Insights from the Gulf Cooperation Council Region". *Cogent Social S.*
- [33] *The State of Food Security and Nutrition in the World Report, 2020*.
- [34] *The State of Food Security and Nutrition in the World Report, 2021*.
- [35] *The State of Food Security and Nutrition in the World Report, 2022*.
- [36] United Nations (2020). "Policy Brief: The impact of COVID-19 on Food Security and Nutrition".
- [37] Workie, E., Mackolil, J., Nyika, J., and Ramadas, S. (2020). Deciphering the Impacts of COVID-19 Pandemic on Food Security, Agriculture and Livelihood: A Review of the Evidence from Developing Countries. *Science Direct*, Vol. 2, Elsevier B V.
- [38] Xu, Z., Elomri, A., Kerbache, L., and Omri, E. A. (2020). COVID-19s Impacts on Global Supply Chains: Facts and Perspectives. *IEEE Engineering Management Review*.