



Chuka University

info@chuka.ac.ke | 020 231 0512 / 020 231 0518

THE ROLE OF ORGANIC AGRICULTURE IN MITIGATING IMPACTS OF PANDEMICS FOR SUSTAINABLE FOOD SECURITY

Gathungu, G. K.

Department of Plant Science, Chuka University, P.

O Box 109-60400, Chuka Email:

gkgathungu@yahoo.com or ggathungu@chuka.ac.ke

How to cite:

Gathungu, G. K. (2022). The role of organic agriculture in mitigating impacts of pandemics for sustainable food security. In: *Isutsa, D. K. (Ed.). Proceedings of the 8th International Research Conference held in Chuka University from 7th to 8th October, 2021, Chuka, Kenya, p. 59-63.*

ABSTRACT

Pandemics like COVID-19 have spread rapidly and extensively around the world resulting to profound implications on food and nutrition security. The pandemics affects food systems stability which threatens food availability, food access and food utilization. Covid-19 has since 2019 become a major disruption to food supply chains due to lockdowns that have resulted to low supply of factors of production like inputs, labour among others resulting to decreased productivity of production systems. The pandemics have resulted in lower incomes and higher prices of some foods, putting food out of reach for many, and undermining the right to food and hence affecting the achievement of Sustainable Development Goal 2. The pandemics are intertwined with the sustainability of food security in complex ways. The Covid-19 pandemic raises the risk that government's attention and funding will be diverted from climate change and environmental maintenance concerns such as biodiversity and ecosystem maintenance to health systems maintenance which will affect the sustainability of the food system and the nations' economies. These situations call for transformation of food systems through farming communities embracing sustainable production systems like organic farming which is low cost and uses locally available resources. Organic farming will enable communities to increase food and nutrition security by enabling diversification of food systems and empower vulnerable and marginalized groups and promote sustainability of the production system across all aspects of food supply chains, from production to consumption. This will occur because organic farming facilitates inter-system linkages that ensures that the food systems, ecological systems, and economic systems results to positive synergies for increased system productivity for sustainable food and nutrition security. This way farmers will be well equipped to steer the world towards a 'new normal' in the way it produces food, trades, and consumes and support the resilience and growth of agricultural producers.

Keywords: Pandemics; Food Systems; Organic Farming; Sustainability

INTRODUCTION

Pandemics like COVID-19 has spread rapidly and extensively around the world resulting to profound implications on food and nutrition security as the unfolding crisis has affected food systems and threatened people's access to food via multiple dynamics (HLPE, 2020). The pandemics affects food systems stability which threatens food security in terms of food availability, food access, food utilization and food stability due to major disruption to food supply chains in the wake of lockdowns triggered by the global health crisis. The outbreak of the COVID-19 pandemic was undoubtedly an exceptional situation that has recently affected all aspects of the everyday life of people around the world ('Smiglak-Krajewska and Wojciechowska-Solis, 2021). The Covid-19 has become a major global economic slowdown that have impacted greatly on the communities' livelihoods. The consequences of COVID-19 on the economy and agriculture have raised many concerns about global food security, especially in developing countries and food security, which is characterized as access to safe and sufficient food, is affected by

economic crises (Rad et al., 2021).

Covid-19 has resulted to low supply of factors of production like inputs, labour among others resulting to decreased productivity of production systems. The decreased production has also resulted in lower incomes to the farmers and higher prices of some food products leaving many households out of reach of food which underpins the right to food which contravenes the achievement of Sustainable Development Goal (SDG) 2 of “Zero hunger.” Before the outbreak of the pandemic, some two billion people faced food insecurity at the moderate or severe level and between 83 and 132 million additional people (FAO et al., 2020) including 38-80 million people in low-income countries that rely on food imports (Torero, 2020)—will experience food insecurity as a direct result of the pandemic. At least 25 countries, including Lebanon, Yemen and South Sudan, are at risk of significant food security deterioration because of the secondary socio-economic impacts of the pandemic (FAO and WFP, 2020).

There are chances that food productivity and the supply chains will also be affected in the future, especially if the pandemics that occur are immediately not contained which will constraint food and nutrition security. There is need for the global community to continue to monitor the situation closely, and respond in necessary ways to avert the worst outcomes with respect to food security and nutrition, and carefully consider how to build more resilient food

systems and ensure the right to food, in order to achieve SDG 2 (HLPE, 2020). This call for transformation of food systems through farming communities embracing sustainable production systems like organic farming. Organic farming enable communities to increase food and nutrition security by enabling diversification of food systems and empower vulnerable and marginalized groups and promote sustainability of the production system across all aspects of food supply chains, from production to consumption. Organic farming facilitates inter-system linkages that ensures food systems, ecological systems, and economic systems results to positive synergies for increased system productivity. The pandemics contribute to negative implications to food security, nutrition and food systems which accelerate the vulnerability of communities especially to the growing effects of climate change. To overcome food and nutrition insecurity from the effects of pandemics like covid-19 there is need for communities to adopt sustainable production practices like organic farming. Organic farming has potential to product quantity, qualify and safe food products that can shield communities of the effects of pandemics.

LITERATURE REVIEW

What is organic farming

Organic farming is a system of farm management and food production that combines best environmental practices; high levels of biodiversity; preservation of natural resources; application of high animal welfare standards; and utilizing production methods in line with the preferences of consumers. Organic food is food produced without the use of artificial fertilizers (grown on soil which is restored only with organic fertilizers), without pesticides, growth regulators, antibiotics, hormones, and many other types of chemicals, and processed without the use of additives and chemical preservatives which are popular in the modern food industry (Smiglak-Krajewska and Wojciechowska- Solis, 2021). Organic farming is one of the noble practices in sustainable agriculture as it promotes and maintains soil and human health; manages and enhances biodiversity. Organic farming, involves managing agricultural holdings by restricting utilization of synthetic fertilizers and pesticides and instead using varied crop farming practices that protect the environment to promote sustainable agricultural development

Pandemics and Organic Farming

By cutting the connections between farmers and food markets, COVID-19 has shocked the food supply chain and reduced food accessibility (Rad et al., 2021). Shocks to the food supply chain by the pandemic can be double in developing and low-income countries (World Bank, 2021; Paslakis et al., 2021; Zurayk, 2020) and endanger the lives of millions of people and smallholders (Huss et al., 2021). COVID-19 has affected the total food demand and supply system that has resulted to an imbalance due to restrictions in production input and labour, supply, changes in consumption patterns, and low local,

regional and international exportation. There are initial effects, medium term and short term impacts on food systems overtime (Table 1). The demand for locally produced organic and health- based food has certainly increased because of COVID as in the early months of the pandemic, markets and stores struggled to stock their shelves due to low deliveries, making local producers more attractive. In addition, some customers may have shifted to more organic products as widespread restaurant closures forced them to prepare more home-cooked meals. The pandemic has intensified the health value of consumers when making decisions about choosing food products as consumers are sensitive shoppers who read the content of the labels and pay attention to the ingredients of the products they buy (Smiglak-Krajewska and Wojciechowska-Solis, 2021).

A performance report released in October 2020 by Organic Produce Network and Category Partners reported that total organic produce sales and volume resulted to double-digit growth in the third quarter, with July-September sales growing 16% and volume up 15% compared with the same period in 2019 (Vegetable Growers News, 2020). Sales of organic fresh produce continue to show no signs of slowing and continue to be a major growth opportunity for retailers across the country as consumers continue to shift from conventional to organic produce. Over the past several decades, the market of organic food and organic farming have been growing rapidly throughout Europe (Łuczka and Kalinowski, 2020; Du, 2017) due to the increasing prosperity of societies, the growing awareness of consumers with regard to the quality and safety of food plus the impact of organic food on human health (Kwasek, 2013). When COVID-19 forced many families to work from home they began seeking out organic produce from small local farms and they stopped visiting large markets, and subscribed to community supported agriculture in nearby farms because it became a priority to know where food consumed comes from. The demand for organic food has been driven by the trends in consumer behavior as there has been increased awareness of customers of the quality and safety of food products. This calls for the prioritization of sustainable local food production and short value chains, that bring the supply closer to the consumer while obtaining fair prices to the farmers. Maintaining a healthy diet and lifestyle during the pandemic is important in fighting infections and maintaining the overall health

well-being. Nutritious and balanced diet provides communities capability to support a healthy immune system against health challenges/infections.

Table 1: COVID-19 impact on food systems

Initial effects (first 1-2 months)	Medium term (next 2-5 months)	Longer term (next 6-24 months)
<ul style="list-style-type: none"> • Global and local disruptions to food supply chains due to lockdowns affects perishable food items leading to food waste • Massive job losses and income constraints lower purchasing power, affecting food access • School closures mean loss of school meals for millions of children • Fewer fresh foods available in markets (fruits, vegetables, dairy, etc), leading to poor diet quality • Early export restrictions by some countries on some food products causes supply and price disruption 	<ul style="list-style-type: none"> • Farm labour and input constraints affect production and prices • Food system worker illnesses contribute to continuation of supply chain disruptions • Global recession sends millions into extreme poverty, further diminishing their ability to access food • Uneven food price effects in local contexts impact food import dependent countries • Altered food environments affects access to healthy and nutritious foods 	<ul style="list-style-type: none"> • Loss of livelihoods and people's access to food, resulting in a massive increase in hunger • Loss of food system livelihoods threatens food system stability and resilience • Shift in diets to less nutritious foods impacts health and livelihood prospects • Ongoing uncertainty constrains long-term investment in the food and agriculture sector • Diminished attention to climate and biodiversity threatens food sustainability

Source: HLPE (2020)

Why Organic Farming

Four principles formulated by International Federation of Organic Agriculture Movements (IFOAM) which was founded in 1972 (IFOAM, 2005 and Luttikholt, 2007) drives organic farming;

- The Principle of Health - Organic agriculture sustain and enhance the health of soil, plant, animal and human as one and indivisible.
- The Principle of Ecology - Organic agriculture is based on living ecological systems and cycles, work with them, emulate them and help sustain them.
- The Principle of Fairness - Organic agriculture builds on relationships that ensure fairness with regard to the common environment and life opportunities.
- The Principle of Care - Organic agriculture is managed in a precautionary and responsible manner to protect the health and wellbeing of current and future generations and the environment.

The opportunities for the global growth of the bioeconomy (BE) are generated by the need to expand the food supply for an increasing world population without compromising the environment and organic agriculture is more environmentally friendly than conventional agriculture and capable of addressing sustainable development objectives by using green technologies, resulting in economic, social, and ecological benefits (Cidón et al., 2021). The organic farming practices includes;

- Crop diversification
- Crop selection
- Crop rotation
- Green manuring/cover cropping and mulching
- Green fallowing
- Intercropping, push-pull, and agroforestry
- Companion planting
- Effective weed control
- Landscaping, farmscaping and permaculture
- Plant nutrition and nutrient management
- Natural pest management
- Application of effective micro-organisms, biostimulants and biofertilizers
- Soil biology management
- Application of organic manures/ composting
- Multistory/ vertical farming

The growing environmental challenges, mainly resulting from human activities, require the control of production practices and consumer attitudes to protect natural resources and achieve sustainable agricultural development. This can be facilitated through use of renewable resources like organic manures, solar energy, hydro energy among others that can allow societies to maintain their economic growth while limiting negative impacts on the environment and preserving the natural resources.

Organic Farming and Sustainable Development Goals

Organic production methods play a double social role; on the one hand, they deliver goods to a specific market driven by demand for organic products; on the other, they ensure access to public goods, which contributes to environmental protection, animal welfare and rural development (Łuczka et al., 2021). Increase in agricultural developments to provide food to the growing population has resulted to negative environmental and social impacts such as soil degradation, biodiversity loss, water and soil pollution, increasing greenhouse gas emissions among others which threatens the productive potential of the world's natural resources. To solve these challenges requires a holistic, transformative approach, building on the principles of economic, social and environmental sustainability. The sustainable development goals (SDGs) are interconnected, meaning success in one can directly affect the success of others.

Organic agriculture plays many functions that assists in the achievement of SDGs. Organic agriculture provide incomes to poor and marginal farmers, results to higher incomes from premiums of organic produce, and is labor-intensive nature can help absorb excess rural labor and can lower rates of rural-urban migration for work leading to

achievement of SDG1:No poverty. The diversified cropping system supported by organic agriculture mitigates risks of crop failure, more nutritious food, improved productivity and sustainability of productive bases, and helps protect genetic resources (SDG 2 –Zero hunger). The non-exposure to chemicals improves health and promotes healthy lifestyles (SDG 3-health and well-being). The labor-intensive nature provides safe local employment for women, thus avoiding migration to ban areas for work (SDG 5-Gender equity)

The less fertilizer leaching, in the organic farming systems reduces pollution of water bodies (SDG 6-Clean water and sanitation) while the safer and healthier working environment by way of non-exposure to chemical inputs (SDG 8 Decent work environment and economic growth). Since synthetic pesticides are virtually eliminated in organic agriculture, the tradeoff between water pollution and food production is significantly reduced (Pimentel et al., 2005). The steady incomes from sustainable practices that improve overtime, hence has the potential to bridge gaping inequalities (SDG 10 Reduced inequalities). Organic farming further mitigate climate change and help farms become resilient to extreme weather patterns and events (SDG 13 Climate action). For example, soils rich in organic matter have increased water storage capability, reduce surface runoff and erosion and can sustain a supply of water during periods of drought (IFOAM, 2012) which increase resilience to bad weather conditions. Organic farming encourages contract farming, partnership with international agribusiness firms that can provide sustainable livelihoods (SDG 16: Peace and justice, strong institutions, SDG 17: Partnerships for the goals)

CONCLUSIONS AND PROSPECTS

There is need for government towards achieving the Big Four Agenda to prioritize organic agriculture to develop innovations that enable increase productivity to bridge the gap on food security and nutrition. The growth of organics has value, as fewer synthetic pesticides, fertilizers, and other chemical inputs. There is an urgent need to increase investment in organic agriculture research that is directed to the needs of smallholder farmers for increased food security. This way farmers will be well equipped to steer the world towards a ‘new normal’ in the way it produces food, trades, and consumes and support the resilience and growth of agricultural producers.

REFERENCES

- Cidón, C.F.; Figueiró, P.S, and D. Schreiber. 2021. Benefits of Organic Agriculture under the Perspective of the Bioeconomy: A Systematic Review. *Sustainability* 2021, 13, 6852. <https://doi.org/10.3390/su13126852>.
- Du, S.; Bartels, J.; Reinders, M, and S. Sen. 2017. Organic consumption behavior: A social identification perspective. *Food Qual. Prefer.* 62, 190–198.
- FAO & WFP. 2020. FAO-WFP early warning analysis of acute food insecurity hotspots. July 2020. Rome, FAO & WFP. (also available at <http://www.fao.org/documents/card/en/c/cb0258en>).
- FAO, IFAD, UNICEF, WFP & WHO. 2020. The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets. Rome, FAO. (also available at <https://doi.org/10.4060/ca9692en>).
- HLPE. 2020. Impacts of COVID-19 on food security and nutrition: developing effective policy responses to address the hunger and malnutrition pandemic. High Level Panel of Experts on Food Security and Nutrition, Rome. September 2020. <https://doi.org/10.4060/cb1000en>
- Huss, M.; Brander, M.; Kassie, M.; Ehlert, U.; Bernauer, T. Improved storage mitigates vulnerability to food-supply shocks in smallholder agriculture during the COVID-19 pandemic. *Glob. Food Secur.* 2021, 28.
- International Federation of Organic Agriculture Movements (IFOAM). 2005. The IFOAM norms for organic production and processing. Version 2005. IFOAM, Germany.
- IFOAM. 2012. Organic Agriculture - A strategy for Climate Change Adaptation. Retrieved from https://www.ifoam-eu.org/sites/default/files/page/files/ifoameu_policy_climate_change_adaptation_dossier_201212_0.pdf
- Kwasek, M. 2013. From Research on Socially Sustainable Agriculture (21). Organic Food—Legal Regulations, Control and Certification System. Institute of Agricultural and Food Economics; National Research Institute: Warsaw, Poland.
- Łuczka, W and S. Kalinowski. 2020. Barriers to the development of organic farming: A Polish case study. *Agriculture*, 10, 536.
- Łuczka, W.; Kalinowski, S, and N. Shmygol. 2021. Organic Farming Support Policy in a Sustainable Development Context: A Polish Case Study. *Energies* 2021, 14, 4208. <https://doi.org/10.3390/en14144208>.
- Luttikholt, L.W.M. 2007. Principles of organic agriculture as formulated by the International Federation of Organic Agriculture Movements. *Wageningen Journal of Life Sciences (NJAS)* 54 (4):347-360.
- Paslakis, G.; Dimitropoulos, G.; Katzman, D.K. A call to action to address COVID-19-induced global food insecurity to prevent hunger, malnutrition, and eating pathology. *Nutr. Rev.* 2021, 79, 114–116.
- Pimentel, D., Hepperly, P., Hanson, J., Douds, D., & R. Seidel. 2005. Environmental, Energetic, and Economic Comparisons of Organic and Conventional Farming Systems. *BioScience*, 55(7), 573–582. [https://doi.org/10.1641/0006-3568\(2005\)055\[0573:eeaeo\]2.0.co;2](https://doi.org/10.1641/0006-3568(2005)055[0573:eeaeo]2.0.co;2)
- Rad, A.K., Shamshiri, R.R., Azarm, H., Balasundram, S.K, and M. Sultan. 2021. Effects of the COVID-19 Pandemic on Food Security and Agriculture in Iran: A Survey. *Sustainability* 2021, 13, 10103. <https://doi.org/10.3390/su131810103>
- Smiglak-Krajewska, M, and J. Wojciechowska-Solis. 2021. Consumer versus Organic Products in the COVID-19 Pandemic: Opportunities and Barriers to Market Development. *Energies* 2021, 14, 5566. <https://doi.org/10.3390/en14175566>.
- Torero, M. 2020. Prepare food systems for a long-haul fight against COVID-19. [online]. Washington, DC, IFPRI. <https://www.ifpri.org/blog/prepare-food-systems-long-haul-fight-against-covid-19>).
- Vegetable Growers News. 2020. Organic fresh produce sales top \$2B for third quarter. Great American Media Services. <https://vegetablegrowersnews.com/news/organic-fresh-produce-sales-top-2b-for-third-quarter/>
- World Bank. 2021. Latest Commodity Prices Published. Available online: <https://www.worldbank.org/en/research/commoditymarkets>.

Syst. Community Dev.
2020, 1–5.