

Extended Abstract

Please do not add your name or affiliation

Paper/Poster Title	Double shocks: Implication of COVID-19 pandemic and the Russia-Ukraine conflict for rice value chain, trade and fertilizer use in Africa
---------------------------	---

Abstract prepared for presentation at the 98th Annual Conference of The Agricultural Economics Society will be held at The University of Edinburgh, UK, 18th - 20th March 2024.

Abstract	200 words max
<p>In 2020, the world saw the emergence of one of the deadliest pandemics in recent times which has been associated with food and nutrition insecurity. When things were somewhat improving two years later, the Russia-Ukraine conflict showed its face sometime in February 2022 with further implications on food and nutrition security. These double shocks pose serious constraints on various staple value chains including rice which is heavily consumed in many parts of Africa. Given this, we examine how the rice value chain was fairing under both the COVID-19 pandemic and the Russia-Ukraine conflict. We look at various aspects such as prices, production, yields, consumption, and trade (imports and exports). In light of the fertilizer crises in many parts in Africa, we also look at aspects of fertilizer use. We rely on different datasets and databases to examine the above issues. We look at three different time periods; pre-COVID (2018-2020), during COVID (2022-2022) and post COVID which also reflects the Russia-Ukraine war (2022-2023). We document some interesting findings; (1) Both COVID-19 and the Russian-Ukraine war depict some negative correlations with rice production, area under production and yields; (2) Related to reduced production, area of production also saw a decrease which is associated with reduced export value under the twin shocks; (3) Both shocks are positively correlated with reduction in imports and increased rice prices; (4) Fertilizer prices (urea and NPK) have also seen an increase under these Shocks; (5) Rice consumption per capita has increased under the two shocks and (6) the Russian-Ukraine war seems to have a more pronounced association with all these outcomes than the COVID-19 pandemic.</p>	
Keywords	Rice value chain, COVID-19 pandemic; Russia-Ukraine conflict; Food security, Sub-Saharan Africa
JEL Code	Q13, Q18, C93 see: www.aeaweb.org/jel/guide/jel.php?class=Q)
Introduction	100 – 250 words
<p>Agriculture is the engine for growth and is by far the single most important economic activity in Africa. Africa faces a wide range of challenges in the production of staple crops such as rice, maize, and wheat. Keys among these challenges are climate change, COVID-19 pandemic, and the Russia-Ukraine conflict. According to the UN Food and Agriculture Organization, maize, rice, and wheat together make up 51% of the world's calorie intake. Any disruption to their production and value chain would impose deleterious consequences on food systems and delay its transformation. Violent conflicts have negative impacts on food systems and food security (FAO, 2016) while global armed conflicts have been highlighted to be one of the main drivers of hunger worldwide in 2020 (Delgado et al., 2021). As Black Sea countries, Russia and Ukraine are one of the biggest net exporters of various grains that are relevant for food security</p>	



as well as fertilizers that are relevant for increasing agricultural productivity (FAO, 2022). In 2021, Russia and Ukraine ranked amongst the top three global exporters of wheat and maize, while Russia also stood out as the world's top exporter of nitrogen fertilizers and the second leading supplier of both potassic (potassium) and phosphorous fertilizers.

We document the evolution of the rice value chain under both the COVID-19 pandemic as well as the Russian-Ukraine war. We examine the production, area of production, yields and consumption per capita of rice. We also explore trade dynamics by looking at the trend of imports and exports under these double shocks. Furthermore, we delve into aspects of fertilizer use by considering the different use of fertilizers (urea, NPK) in the continent.

Methodology	100 – 250 words
--------------------	------------------------

This study relied on different datasets and databases from the Food and Agriculture Organization of the United Nations (FAO) and United States Agency for International Development (USAID) to analyze changes before the COVID-19 pandemic (2018-2020), during COVID-19 (2020-2022), and during the Russia-Ukraine war (2022-2023) for different outcomes pertaining to the rice value chain, trade, and fertilizer use. We look at various associations of these twin shocks with fertilizer prices, rice price, yield, production, rice area, rice importation and exportation and consumption per capita. International and producers' price of rice (US\$/ton) were collated from USAID while data on the per capita GDP (US\$), and GDP growth rate was collected from World Bank's world development indicators database.

Results	100 – 250 words
----------------	------------------------

We document some interesting findings; (1) Both COVID-19 and the Russian-Ukraine war depict some negative correlations with rice production, area under production and yields (2) Related to reduced production, area of production also saw a decrease which is associated with reduced export value under the twin shocks; (3) Both shocks are positively correlated with reduction in imports and increased rice prices; (4) Fertilizer prices (urea and NPK) have also seen an increase under these Shocks and (5) the Russian-Ukraine war seems to have a more pronounced association with all these outcomes than the COVID-19 pandemic. In economic terms, rice price increased by 12% and 22% during COVID-19 pandemic and Russia-Ukraine war, respectively. Urea and DAP price has increased by 31% and 23%; and 58% and 52% during COVID-19 pandemic and Russia-Ukraine war respectively.

Higher input prices increase production costs and, ultimately, inflation which may in turn also affect food security and increase (food) poverty. In addition, results show that rice consumption has increased in Africa, especially in Sub-Saharan Africa during crisis. Given that it is one of the main staples that is consumed after maize and wheat, this is somewhat expected. As a staple food crop, evidence shows that the consumption of rice is likely not to decrease due to price increases. With high prices and scarcity of wheat, rice could substitute and play a key role in household consumption, especially in urban areas, leading to an increase in rice demand.

Discussion and Conclusion	100 – 250 words
----------------------------------	------------------------

Our results provide evidence that the combination of COVID-19 pandemic and the crisis between Ukraine and Russia has led to substantial changes in rice value chains, trade and fertilizer use and access. Particularly, there has been considerable increases in global and domestic fertilizers and rice prices. Also, rice area has decreased leading to a decrease in the total export value during the crisis. The crisis in Ukraine and the sanctions imposed on Russia exposed African food markets to heightened risks of tighter availabilities, unmet import demand and increase in the prices of staples such as rice and fertilizers. Although countries in sub-Saharan Africa (SSA) use less fertilizers, they have an important import dependency from Russia and Ukraine with low continental production. Russia is the second-largest supplier of fertilizers to countries in ECOWAS, occupying 12% of the market share. In addition, Russia

exported more than 80% of potash to Côte d'Ivoire, Mali, Niger, Senegal, and Sierra Leone. Fertilizer prices, which were already high before the conflict, have now reached record levels in the context of a sharp drop in Russian supply to world market.

Challenges such as low access to fertilizers to produce staple food crops like rice and the reduction of food supply from main exporters such as Ukraine and Russia, are highly likely to be a source of food insecurity in Africa. Given this, it is important to prioritize domestic production of rice as well as fertilizers while ensuring that trade links are not distorted amongst African nation. Also relying on improved rice varieties could help stir agricultural transformation by increasing production and domestic commercialization of rice. It is important that development policy relies on these actions as key entry points to increase the resilience and coping strategies of rice-based agri-food system actors for food and nutrition security.