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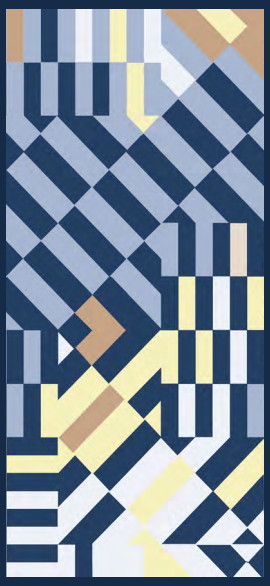
March 2023
No. 26

UKRAINE CRISIS BRIEF SERIES

Exposure and Vulnerability to Fertilizer Trade and Market Disruptions: Malawi Case Study

*Ismael Fofana, **Leysa Maty Sall, and ***Ramos Mabugu



1. Introduction

The sharp increases in global fertilizer prices will likely significantly affect Malawi's economy. While the use of fertilizers in the country is low on average, their use tends to be concentrated in a few sectors which are sensitive to supply disruptions. Malawi does not directly import fertilizer from Russia and Ukraine, essentially relying on global markets to satisfy its domestic needs. The disruption of global fertilizer supply chains and the ensuing sharp price increases are, therefore, certain to affect Malawi's economy. Higher prices and supply shortages reduce application rates which lower productivity per hectare, leading to decreased crop output. Declines in individual crop output lower the agricultural sector's contribution to the overall economy and depress growth of the Gross Domestic Product (GDP). This brief presents the results from simulations of this chain of events for Malawi.

* Director of Capacity and Deployment, AKADEMIYA2063
** Senior Associate Scientist, AKADEMIYA2063
*** Professor of Economics, Sol Plaatje University, School of Economic and Management Sciences

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2. Changes in Global Market Prices of Fertilizers

Figure 1 presents projected fertilizer prices in October 2021, a few months before the Russia-Ukraine war broke out. This represents the baseline scenario and is plotted against projections made in April 2022, representing the Ukraine war scenario. As Figure 1 reveals, the effects of the Russia-Ukraine war on global fertilizer markets are illustrated by the sharp differences between the baseline and the Ukraine war scenarios. Except for potassium, global fertilizer prices in the baseline scenario (which shows the post-COVID-19 situation) would stabilize in 2022 before trending downwards in 2023 and 2024. However, following the start of the war, the downward trend in prices of all fertilizers reversed course, rising instead by at least 40 percent. Essentially, urea prices almost doubled, while potassium prices tripled from their already high levels in 2022. The modest declines projected for 2023 and 2024 under the Ukraine scenario suggest that prices will barely recover from the surge in 2022 and will therefore remain at high levels into 2024. This finding suggests that African economies are projected to face significant increases in the prices of all fertilizer types in 2022, with only modest downward corrections in 2023 and 2024. It also indicates that high fertilizer prices are expected to persist into the near future.

Table 1: Annual Changes in Fertilizer Prices (%)

Type	October 2021 Forecasts			April 2022 Forecasts		
	2022	2023	2024	2022	2023	2024
DAP	1.7	-25.0	-11.1	49.8	-11.1	-18.8
Phosphate rock	8.3	-15.4	-9.1	42.3	-8.6	-6.3
Potassium chloride	54.8	-15.4	0.7	147.6	-9.6	-3.6
TSP	-1.0	-23.1	-10.0	39.4	-13.3	-15.4
Urea	-1.3	-20.0	-8.3	76.0	-11.8	-20.0

Source: World Bank, commodity markets outlook. Retrieved in April 2022.
Note: World Bank forecasts released in October 2021 and April 2022 (in percent).

2. Fertilizer Use Patterns and Trade Disruption Effects

The share of fertilizer used for different types of crops shows that fertilizer use in Malawi tends to be concentrated among a few crops. Figure 2 shows that maize is virtually the only fertilizer-using crop type, accounting for 95 percent of fertilizer use.

Table 2: Fertilizer Use by Type of Crop

	Share Total Fertilizer	Share Agricultural Value Added
Maize	94.72	40.3
Rice	1.59	3.5
Tobacco	3.33	3.3
Tea	0.36	0.5

Source: AKADEMIYA2063, Malawi's Social Accounting Matrices. Retrieved in April 2022.

Compared to the baseline scenario, Malawi is projected to show declines in fertilizer use for all crops under the Ukraine scenario. On average, fertilizer use is expected to decline by between 20 and 30 percent (Figure 3). The highest average change in fertilizer use (approximately 30 percent) is observed for tea. An average decline in fertilizer use is expected among leading cereals, i.e., maize and rice. Fertilizer use is expected to decline further in 2023, with only a partial recovery in 2024. None of the crops is projected to recover from the sharp decline in fertilizer use in 2022, in line with global fertilizer prices remaining solidly above pre-war levels, even into 2024.

Table 3: Changes in Fertilizer Use by Type of Crop, Ukraine vs. Baseline Scenarios (%)

	2022	2023	2024
Maize	-19.9	-24.6	-22.6
Rice	-21.6	-26.2	-23.9
Tobacco	-20.5	-25.2	-23.1
Leaf tea	-28.0	-33.6	-30.5

Source: Data are based on results from authors' simulations. Retrieved in April 2022.

3. Effects of Fertilizer Sector Disruptions on Agricultural Productivity and Growth

The significantly higher fertilizer prices and lower application rates across all crop types will translate into lower output and the decline of Malawi's agricultural sector. This is evidenced by the drop in crop and agricultural output, as well as GDP, under the Ukraine scenario in comparison to the baseline scenario (Figure 4). Agricultural value-added, as a measure of output, declines by nearly 4 percent. As shown in Figure 4, the drop in crop output persists, and sharpens in 2023 and 2024. The analysis also shows that lower output for the different crop types reduces agricultural sector value-added.

Moreover, the decline in agricultural sector output continues through 2024. Figure 4 also shows that the crop and agricultural output decline results in lower GDP growth. More specifically, the rate of GDP decline is close to 1 percent. It is important to note that the rate of GDP decline in 2023 and 2024 exceeds the initial drop in 2022, reflecting the lingering economywide effects of the disruptions to global fertilizer supply chains.

Figure 4: Changes in Output, Ukraine vs. Baseline Scenarios (%)

	2022	2023	2024
Value Added, Crops	-5.6	-7.1	-6.6
Value Added, Agriculture	-3.4	-4.5	-4.3
GDP	-1.0	-1.5	-1.7

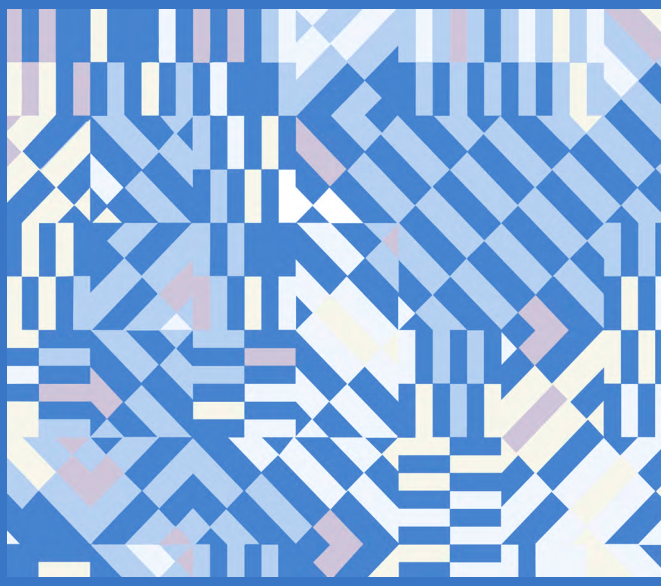
Source: Data are based on results from authors' simulations. Retrieved in April 2022.

4. Conclusion

The Russia-Ukraine war has driven fertilizer prices substantially higher in 2022, with modest price declines projected for 2023 and 2024. This trend suggests that Malawi will continue to face high fertilizer prices in the next few years. The disruptions to the global fertilizer market are expected to reduce fertilizer use and agricultural sector output, negatively affecting GDP growth. The war will therefore pose a noticeable threat to Malawi's economy and food security in the coming years. Unless effective responses are found in 2022 or by the next cycle of growing seasons at the latest, the fertilizer crisis will likely trigger wider macroeconomic and balance of payment problems for Malawi.

Suggested Citation: Fofana, I., L.M. Sall, and R. Mabugu. 2023. *Exposure and Vulnerability to Fertilizer Trade and Market Disruptions: Malawi Case Study*. AKADEMIYA2063 Ukraine Crisis Brief Series, No. 26. Kigali, Rwanda: AKADEMIYA2063. https://doi.org/10.54067/ucbs.26

AKADEMIYA2063 is supported financially by the United States Agency for International Development (USAID), the Bill and Melinda Gates Foundation (BMGF), the German Federal Ministry for Economic Cooperation and Development (BMZ), the African Development Bank (AfDB), the UK's Foreign, Commonwealth & Development Office (FCDO), the Global Center on Adaptation (GCA), and the Food and Agriculture Organization of the United Nations (FAO). The views expressed in this publication do not necessarily reflect those of the funders.



AKADEMIYA2063 | Kicukiro/Niboye KK 341 St 22 | 1855 Kigali-Rwanda

+221 77 761 73 02 | +250 788 315 318 |

hq-office@akademiya2063.org

www.akademiya2063.org

@AKADEMIYA2063