AKADEMIYA

The Expertise We Need. The Africa We Want.

September 2022
No. 008

UKRAINE CRISIS BRIEF SERIES

Contagion and Exposure of African Countries to Global Fertilizer Trade Disruptions

Ousmane Badiane, Ismael Fofana, Leysa M. Sall, and Wondwosen Tefera

1. Introduction

Russia and Ukraine play a notable role in food and agriculture trade at the global level. For instance, the two countries account for 30% of global wheat exports (FAO, 2022). Studies also show that Russia and Ukraine are among the leading exporters of fertilizers, edible oils, and other commodities. It is no surprise then, that the war between the two countries is having significant consequences on food and agricultural trade as well as on food security, particularly among low-income and net food importing countries, including those in Africa.

Scientific literature documents that the increased use of fertilizer plays a key role in enhancing the productivity of the agricultural sector. However, Africa lags far behind the world in the application of fertilizer. Between 2014-2018, Africa as a whole applied an average of 26.5 kilograms of fertilizer per hectare (kg/ha) of cultivated land (ReSAKSS, 2022). This is much lower than the global average of 135 kg/ha (AfDB, 2020). It is therefore evident that the Ukraine-Russia crisis will have significant impacts on the continent's already underdeveloped fertilizer sector. The objective of this brief is to descriptively analyze the ramifications of the Ukraine-Russia crisis on the fertilizer trade in Africa. It focuses on trends in the global prices of fertilizers, the direct and indirect exposure of African countries to fertilizer imports from Ukraine and Russia, as well as the contagion effects through regional re-export markets.

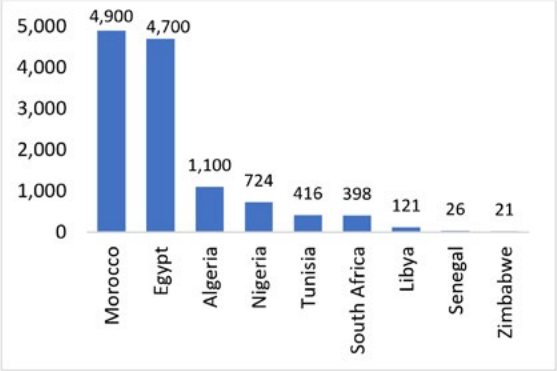
THE UKRAINE CRISIS AND AFRICAN ECONOMIES

1.1 Production and Use of Fertilizers in Africa

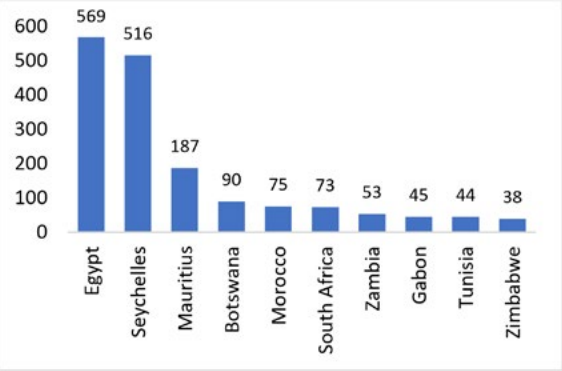
Nine African countries produce fertilizers, with Morocco and Egypt leading in production. In 2019, the two countries produced 4,900 and 4,700 thousand tons respectively (Figure 1A).

Figure 1: *Production and Consumption of Fertilizer in Africa*

A. **Producers in thousand tonnes (2019)**



B. **Top 10 consumers in kg/ha (2018)**

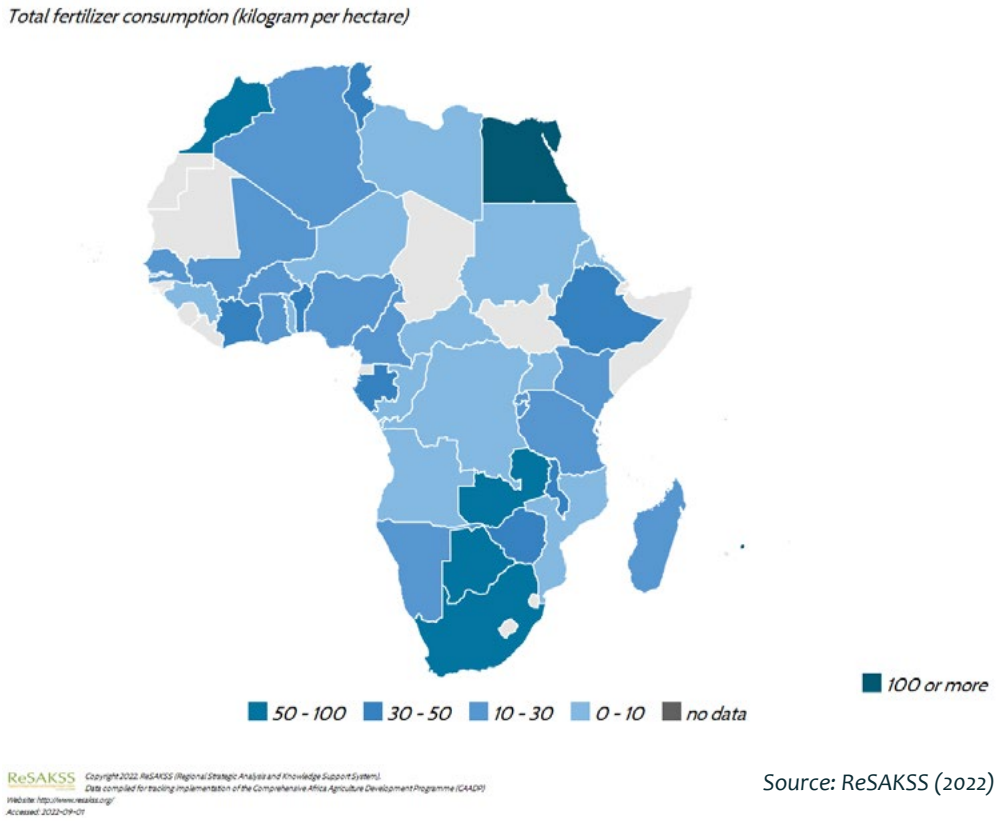


Source: FAO (2022) and ReSAKSS (2022)

Algeria and Nigeria are the other major producers followed by Tunisia and South Africa. Generally, the Northern Africa region is the main producer of fertilizer in the continent relative to the other regions.

Figure 1B shows the top 10 fertilizer users in Africa measured in kilograms per hectare (kg/ha) of cultivated land. The data shows that each of these 10 countries uses more fertilizer than the average of 26.5 kg/ha for Africa as a whole. In fact, Egypt, Seychelles, and Mauritius use more fertilizer per hectare than the world average of 135 kg/ha. Other major consumers include Botswana, Morocco, South Africa, and Zambia which use more than 50 kg/ha, the minimum target that was set in the 2006 Abuja Declaration on Fertilizer for the African Green Revolution. Regionally, Northern Africa dominates the other regions with the use of 112 kg/ha of cultivated land in 2018 followed by Southern Africa at 43 kg/ha for the same period. Eastern, Western, and Central Africa use 16.9 kg/ha, 16.7 kg/ha, and 6.5 kg/ha respectively (ReSAKSS, 2022). Figure 2 which shows fertilizer consumption in 2018 confirms that countries in Northern and Southern Africa lead in consumption. The figure also shows that the majority of African countries lag far behind not just from the global average but also from the 50 kg/ha target set in the 2006 Abuja Declaration.

Figure 2: *Fertilizer Consumption in Kilogram per Hectare (Kg/Ha) of Cultivated Land in 2018*

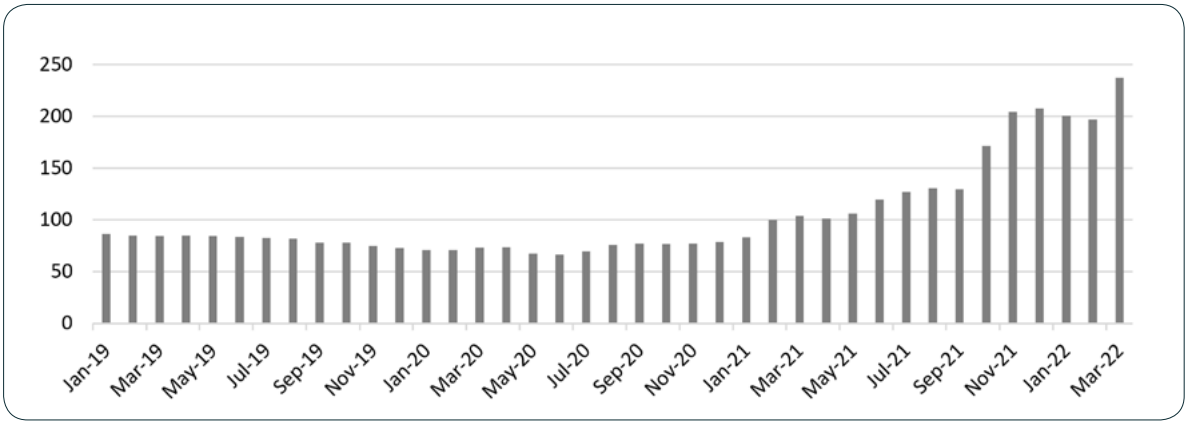


Source: ReSAKSS (2022)

1.2 Recent Trends in International Fertilizer Prices

Monthly price indices for fertilizers[1] remained relatively stable from 2019 until early 2021 (Figure 3). Several factors were behind this stable price trend. The first and foremost was lower input costs including ammonia, natural gas, and coal especially following the outbreak of the COVID-19 pandemic globally. Notably, the disruption of global supply chains following the pandemic outbreak did not immediately translate into increased fertilizer prices. Availability of stocks (inventories) may also have contributed to the stability of global prices and created a price lag effect. However, as Figure 3 shows, fertilizer prices started to rise slowly in 2021 and then more rapidly during the second quarter of the same year. The key force driving this upward trend was the higher demand observed in major crop-growing regions (Baffes and Koh, 2021). In the following months, the trend surged and reached its peak in December 2021 before starting to decline in January and February of 2022. Nonetheless, following the onset of the Ukraine-Russia crisis in late February, this declining trend was reversed, and the global fertilizer price recorded a 21% increase in the following month.

Figure 3: *Monthly Price Indices of Fertilizer from January 2019 to March 2022 (nominal US dollars, 2010=100)*

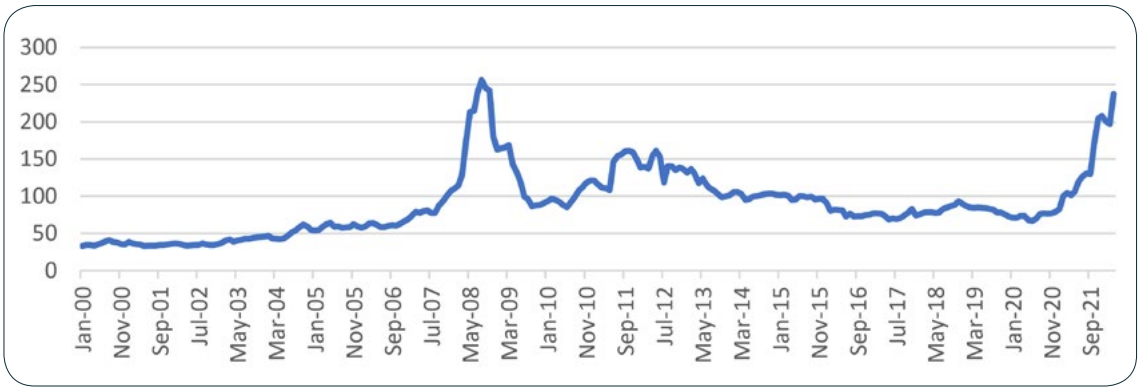


Source: World Bank (2022).

[1]Fertilizer price index is a weighted average price of five types of fertilizer: phosphate rock, DAP (Di-ammonium Phosphate), TSP (Triple superphosphate), Urea, and Potassium chloride.

The price hike observed in March 2022 is significant not only when compared to the recent past but also over the last several years. The fertilizer price index in March 2022 reached USD 238 which is closer to the record level of USD 256 observed in August 2008, during the global economic crisis (Figure 4). A detailed comparison of fertilizer prices shows that the price of urea has surpassed the price recorded in 2008 while the prices for phosphates and potash are approaching the 2008 levels (Baffes and Koh, 2022). This trend is challenging the affordability of fertilizer globally.

Figure 4: *Monthly Price Indices of Fertilizer from January 2000 to March 2022 (nominal US dollars, 2010=100)*

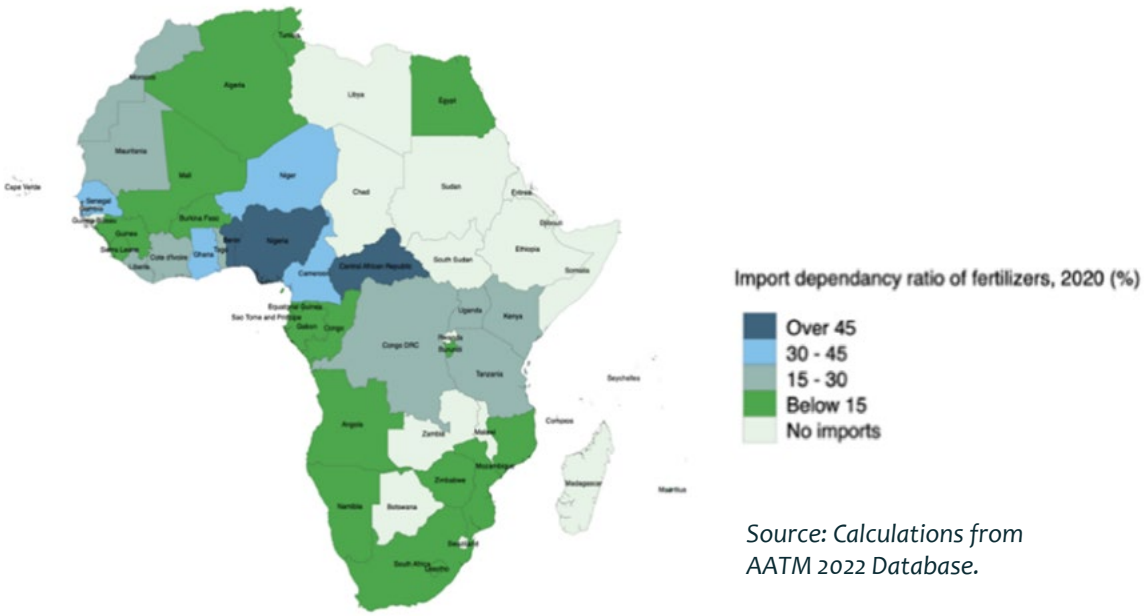


Source: World Bank (2022).

2. Direct Exposure of African Countries to Fertilizer Imports from Ukraine and Russia

Two-thirds (or 36/55) of African countries import fertilizer from Russia and Ukraine, illustrating the importance of the two countries in supplying fertilizers to African countries and their exposure to the current crisis. Closer examination shows that these 36 African countries exhibit different levels of import dependency. Three of the 36 countries, namely Central Africa Republic (CAR), Benin, and Nigeria, are highly exposed with an import dependency ratio of above 45%. The exposure is the highest in CAR and Benin with a dependency ratio of 97% and 89% respectively while it is 48% for Nigeria. They are followed by Niger, Senegal, Cameroon, and Ghana with a significant level of exposure indicated by a dependency ratio ranging between 30% and 45%. Another nine countries exhibit a moderate to a substantial level of exposure: Côte d'Ivoire, Democratic Republic of Congo (DRC), Kenya, Liberia, Mauritania, Morocco, Tanzania, Togo, and Uganda.

Figure 5: *Dependency on Fertilizer Imports from Ukraine and Russia (share of in-country imports)*



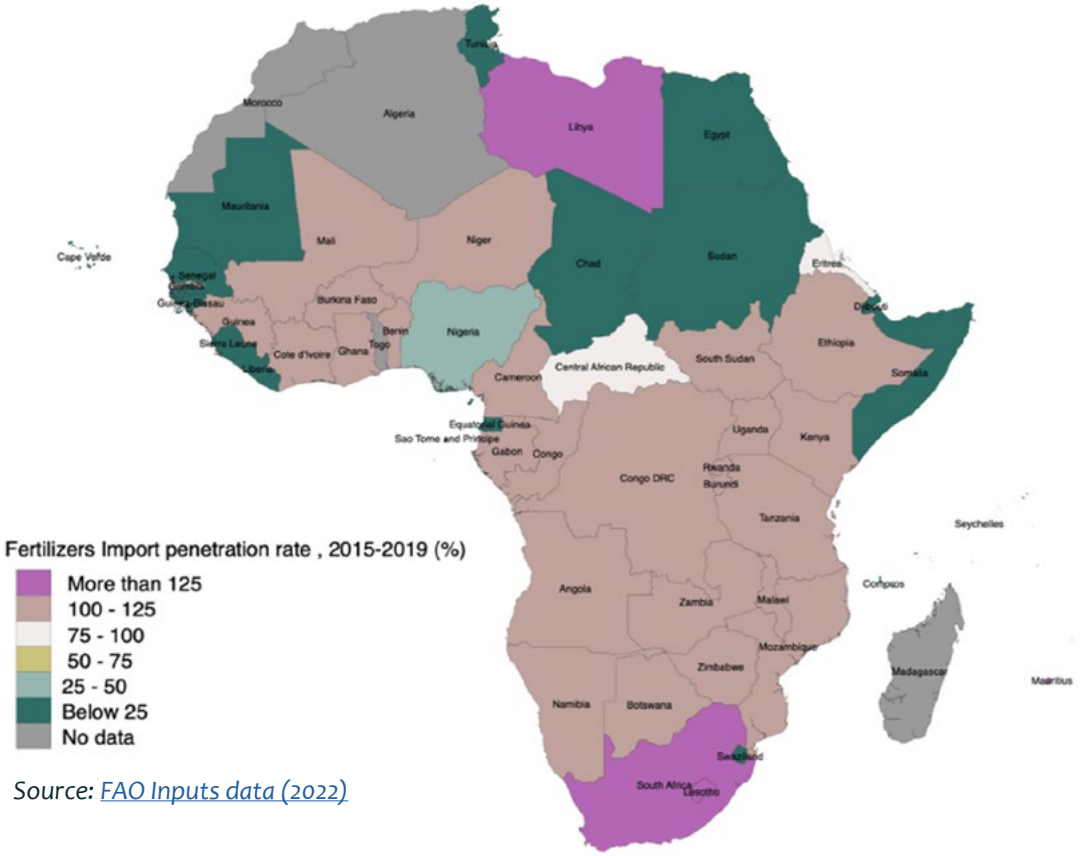
Source: Calculations from AATM 2022 Database.

The remaining group of 20 countries have dependency ratios of less than 15 percent. These countries are mainly located in the western and southern parts of the continent (Figure 5). The disruption of fertilizer exports from Russia and Ukraine as a result of the war between the two countries is expected to significantly affect the entire group of countries listed above which translates into more than 70 % of African countries. Those African countries that depend heavily on Russia and Ukraine for their fertilizer imports will have to look for other suppliers if the trade disruptions continue to persist in the near future.

3. Indirect Exposure of African Countries through High Import Penetration

Fertilizer import penetration measures the extent to which fertilizer imports cover domestic consumption of fertilizer. It is an indication of the relative importance of fertilizer imports in overall domestic consumption.

Figure 6: *Fertilizer Import Penetration, Average 2015-2019 (Imports/Domestic Consumption)*



Source: *FAO Inputs data (2022)*

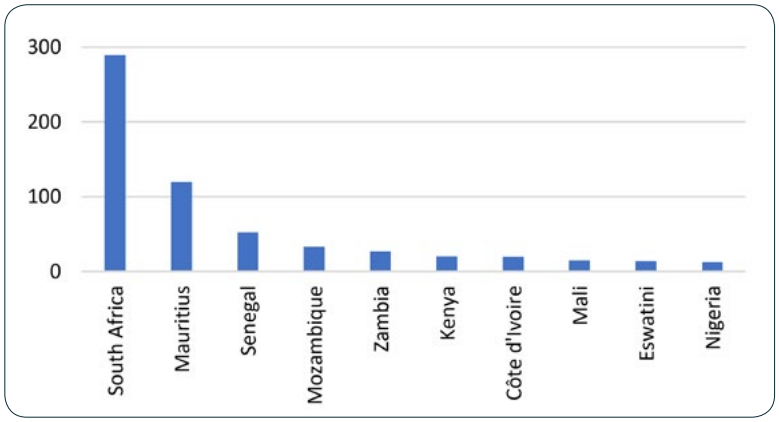
Figure 6 shows that in the 2015-2019 period, many African countries (20) had a fertilizer import penetration rate that was higher than 100%, meaning that they imported more fertilizers than they consumed over this period[2]. While allowing for keeping a maximum of 5% of imported fertilizers in storage for consumption in the next cropping period, the remaining significant imported quantities in many of these countries indicate that they engage in re-exportation to their neighboring countries. This means that many more countries are exposed to the disruption of fertilizer markets and the increase in global fertilizer prices beyond those with direct trade links to Russia and Ukraine or those involved in the global fertilizer trade, generally. In other words, countries do not have to be engaged in global fertilizer trade to be exposed to the risks associated with the Ukraine-Russia crisis. Rather, what is happening at the global level can be transmitted to regional and local markets through re-exports.

[2]The 20 countries are Botswana, Cameroon, Congo, Côte d'Ivoire, Gambia, Ghana, Kenya, Libya, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Seychelles, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe.

4. Contagion through Regional Re-export Markets

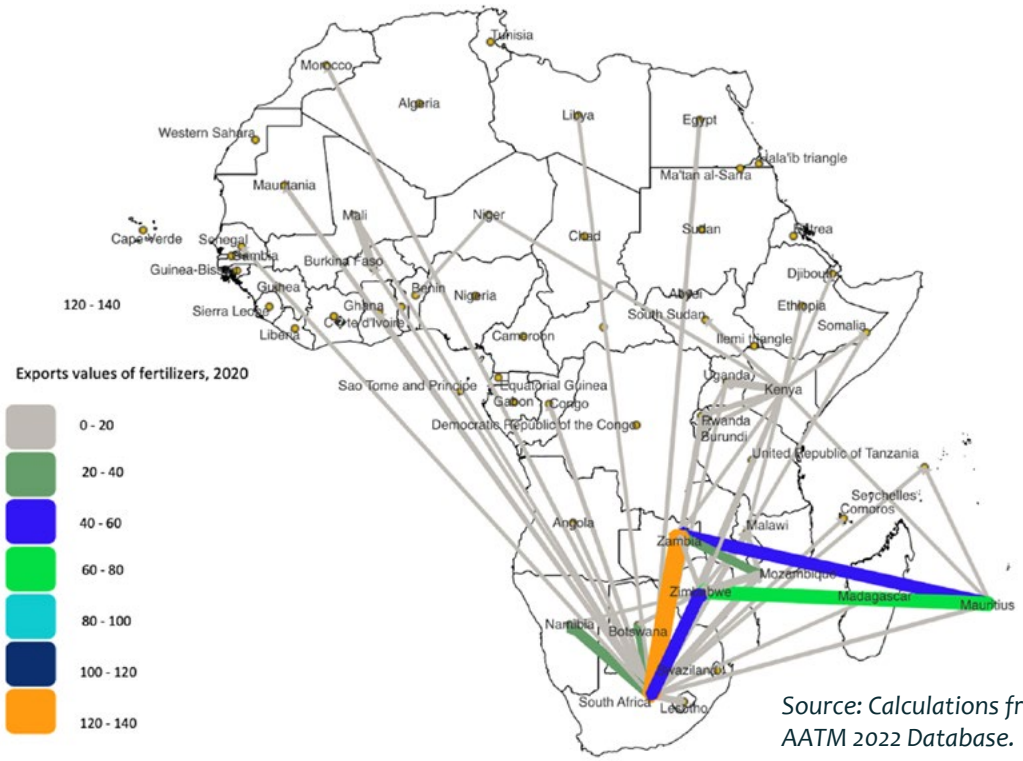
Fertilizer re-exports within Africa were valued at 581 million USD in 2020. Figure 7 shows the top 10 countries involved in fertilizer re-exports in Africa in 2020. Most countries re-export mainly to their neighbors (see tables in Annex for details). For instance, Uganda, Rwanda, Tanzania, Ethiopia, South Sudan, Somalia, and Djibouti are indirectly exposed to fertilizer re-exportations from Kenya. Similarly, Western African countries including Burkina Faso, Guinea, Mali, Niger, and Togo are indirectly exposed to fertilizer re-exportation from Cote d'Ivoire and Ghana. Many African countries re-export fertilizer to their neighbors which exposes the latter indirectly to global market shocks. As Figure 8 shows, the network of re-exports is particularly dense in Southern Africa. South Africa which is the fourth largest fertilizer exporter to African countries after Morocco, Russian Federation, and Saudi Arabia, is a major player in the region (AATM Database, 2022). The overall ramifications of the crisis are therefore, much more significant than can be immediately understood from the first wave of shocks hitting countries that are directly involved in global markets.

Figure 7: *Top 10 Countries involved in Fertilizer Re-exportation within Africa in 2020 (Million USD)*



Source: AATM 2022 Database.

Figure 8 : *Intra-regional Fertilizer Re-export Flows in 2020 (Million USD)*



Source: Calculations from AATM 2022 Database.

5. Conclusion

The ongoing Ukraine-Russia crisis has resulted in the disruption of global fertilizer markets and the rise of fertilizer prices to unprecedented levels, not seen in the last decade. The impacts of these disruptions are likely to be substantial among African countries as two-thirds of them are directly and relatively highly dependent on fertilizer imports from Russia and Ukraine. The sharp increases in global prices and the high levels of import dependency will have potentially significant impacts on agricultural productivity and food security among many African countries as well as pose real threats to the livelihoods of vulnerable population groups.

It is worth noting that a number of African countries which do not trade directly with Ukraine, Russia or in global fertilizer markets are still indirectly exposed to the impacts of the crisis through a vast network of large quantities of cross-border re-exports, particularly from neighboring countries. It is very likely that the burden of adjusting to fertilizer market disruptions will be felt more severely in re-importing countries, since their primary importing neighbors are likely to absorb the global market shocks by adjusting re-export quantities and prices. The dense web of re-exports in Figure 8 is an indication of the critical importance of keeping borders open and allowing cross-border trade to continue. It also highlights the need to coordinate responses among neighboring countries.

References

AfDB. 2020. Africa's fertilizer sector and the Bank's High 5s. https://www.afdb.org/en/news-and-events/africas-fertilizer-sector-and-banks-high-5s-36830

FAO. 2022. Impact of the Ukraine-Russia conflict on global food security and related matters under the mandate of the Food and Agriculture Organization of the United Nations (FAO) https://www.fao.org/3/ni734en/ni734en.pdf

FAOSTAT 2022. https://www.fao.org/faostat/en/#data/RFN

John Baffes and Chian Koh. 2021. Fertilizer prices expected to stay high over the remainder of 2021. World Bank Blogs. https://blogs.worldbank.org/opendata/fertilizer-prices-expected-stay-high-over-remainder-2021

John Baffes and Chian Koh. 2022. Fertilizer prices expected to remain higher for longer. World Bank Blogs. https://blogs.worldbank.org/opendata/fertilizer-prices-expected-remain-higher-longer

ReSAKSS Database. 2022. https://www.resakss.org/node/11

ANNEX

Table 1: Fertilizer Re-exports within Central Africa in 2020, Million USD

	African Importers								
	CAR	Congo	Gabon	**Total Inside Region**		Angola	Senegal	**Total Outside Region**	
Exporter				Value	Percent			Value	Percent
Cameroon		0.0		0.0	100.0			0.0	0.0
Congo	0.0		0.1	0.1	64.8	0.1		0.1	35.2
All Exporters	0.0	0.0	0.1	0.1	60.8	0.1	0.0	0.1	39.2

Source: AATM 2022 database.

Table 2: Fertilizer Re-exportation within Eastern Africa in 2020, Million USD

	African Importers													
	Comoros	Djibouti	Ethiopia	Kenya	Madagascar	Mauritius	Rwanda	Seychelles	Somalia	South Sudan	Tanzania	Uganda	Total Inside Region	
Exporter													Value	Percent
Kenya		0.0	0.3				2.9		0.1	0.1	0.8	13.5	17.8	87.3
Mauritius				0.0	0.5			0.1					0.6	0.5
Tanzania	0.1			6.7			0.2						6.9	60.1
Uganda													0.0	0.0
All Exporters	0.1	0.0	0.3	8.6	0.5	0.0	3.1	0.1	0.1	0.1	3.3	13.5	29.6	17.9

Source: AATM 2022 database.

Table 3: Fertilizer Re-exports within Eastern Africa in 2020, Million USD (cont.)

Exporter	African Importers						Total Outside Region	
	Burundi	Malawi	Mozambique	South Africa	Zambia	Zimbabwe	Value	Percent
Kenya	0.7	0.1		1.7	0.1	0.1	2.6	12.7
Mauritius				0.3	51.3	67.8	119.5	99.5
Tanzania	4.0	0.0			0.6		4.6	39.9
Uganda	0.0						0.0	100.0
All Exporters	4.7	2.7	2.8	5.9	52.1	67.9	136.1	82.1

Source: AATM 2022 database.

Table 4: Fertilizer Re-exports within Southern Africa in 2020, Million USD

Exporter	African Importers										Total Inside Region	
	Angola	Botswana	Eswatini	Lesotho	Malawi	Mozambique	Namibia	South Africa	Zambia	Zimbabwe	Value	Percent
Botswana								0.0	0.0	0.0	0.1	100.0
Eswatini						0.0		0.7	0.9		1.6	11.5
Lesotho								0.0			0.0	100.0
Malawi						0.2			0.9		1.1	100.0
Mozambique					2.4				18.1	12.4	33.0	100.0
Namibia	0.3							0.4	1.0		1.7	100.0
South Africa	0.4	18.7	21.9	6.9	3.3	10.3	30.4		126.1	49.9	267.9	92.5
Zambia					0.0	0.2		0.2		0.1	0.4	1.6
Zimbabwe		0.4			0.1	0.3	0.0		1.2		2.0	100.0
All Exporters	0.7	19.1	21.9	6.9	5.9	10.9	30.4	1.4	148.2	62.4	307.7	83.6

Source: AATM 2022 database.

Table 5: Fertilizer Re-exports within Southern Africa in 2020, Million USD (cont.) USD

	African Importers												
Exporter	Burkina Faso	Burundi	Comoros	Congo	Côte d'Ivoire	DR Congo	Egypt	Ghana	Guinea	Kenya	Libya	Total Outside Region Value	Total Outside Region Percent
Botswana												0.0	0.0
Eswatini	0.1											12.1	88.5
Lesotho												0.0	0.0
Malawi												0.0	0.0
Mozambique												0.0	0.0
Namibia												0.0	0.0
South Africa	0.1	0.3	0.1	1.0	0.0	17.0	0.6	0.0	0.0	0.3	0.0	21.8	7.5
Zambia				0.1		26.2						26.3	98.4
Zimbabwe												0.0	0.0
All Exporters	0.1	0.3	0.1	1.2	0.0	43.2	0.6	0.0	0.0	0.3	0.0	60.2	16.4

Source: AATM 2022 database.

Table 6: Fertilizer Re-exports within Southern Africa in 2020, Million USD (Cont.)

	African Importers												
Exporter	Madagascar	Mali	Mauritania	Mauritius	Morocco	Rwanda	Senegal	Seychelles	Somalia	Togo	Uganda	Tanzania	Total Outside Region Value	Total Outside Region Percent
Botswana													0.0	0.0
Eswatini			4.0			0.0				8.1			12.1	88.5
Lesotho													0.0	0.0
Malawi													0.0	0.0
Mozambique													0.0	0.0
Namibia													0.0	0.0
South Africa	0.1	0.0	1.1	0.3	0.4	0.2	0.0	0.1	0.1		0.0	0.1	21.8	7.5
Zambia											0.0		26.3	98.4
Zimbabwe													0.0	0.0
All Exporters	0.1	0.0	5.1	0.3	0.4	0.3	0.0	0.1	0.1	8.1	0.0	0.1	60.2	16.4

Source: AATM 2022 database.

Table 7: Fertilizer Re-exports within Western Africa in 2020, Million USD

	African Importers														
	Benin	Burkina Faso	Côte d'Ivoire	The Gambia	Ghana	Guinea	Guinea-Bissau	Liberia	Mali	Niger	Nigeria	Senegal	Sierra Leone	Togo	Total Inside Region
Exporter															Value Percent
Côte d'Ivoire		9.4			0.0	0.5		0.8	4.2	4.5		0.0		0.4	19.7 100.0
Ghana		3.0	0.2			0.5			0.3	0.1	0.0	0.0		0.1	4.2 100.0
Mali		14.8	0.1												14.9 100.0
Niger	0.0														0.0 6.6
All Exporters	23.4	31.8	1.4	0.8	3.2	1.7	0.0	0.8	56.0	4.6	0.0	9.5	0.0	1.7	134.9 91.4

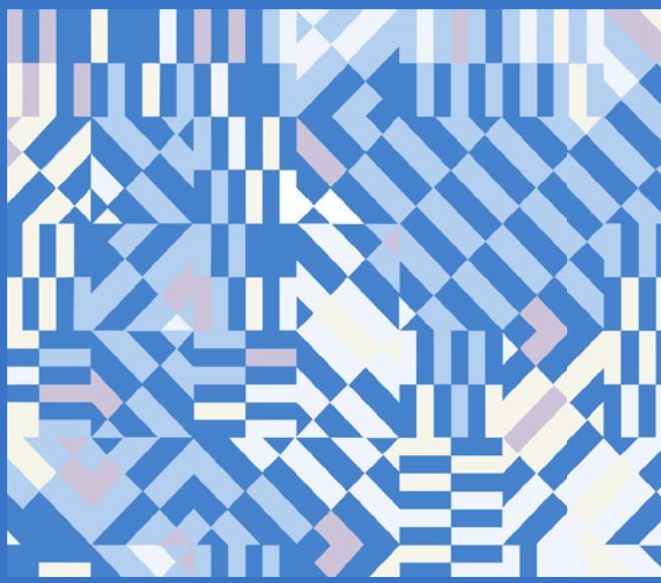
Table 8: Fertilizer Re-exports within Western Africa in 2020, Million USD (cont.)

	African Importer						
	Cameroon	Congo	Gabon	Kenya	Mauritania	South Africa	Total Outside Region
Exporter							Value Percent
Côte d'Ivoire	0.0		0.0				0.0 0.0
Ghana							0.0 0.0
Mali							0.0 0.0
Niger				0.0			0.0 93.4
All Exporters	5.6	0.0	0.0	0.0	0.0	7.0	12.7 8.6

Suggested Citation: Badiane, O., et al, 2022. Contagion and Exposure of African Countries to Global Fertilizer Trade Disruptions. AKADEMIYA2063 Ukraine Crisis Brief Series, No. 008, AKADEMIYA2063, Kigali, Rwanda.

This work was funded by the UK's Foreign, Commonwealth and Development Office (FCDO) through a grant from the Alliance for a Green Revolution in Africa (AGRA).

AKADEMIYA2063 is supported financially by the African Development Bank (AfDB), the German Federal Ministry for Economic Cooperation and Development (BMZ), the Bill and Melinda Gates Foundation (BMGF), and the United States Agency for International Development (USAID) Feed the Future Policy LINK program under Cooperative Agreement 7200AA19CA00019. 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