

The Inorganic Fertilizer Price Surge in 2021: Key Drivers and Policy Options

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Key Messages

- August 2021 retail prices for common varieties of fertilizer have increased 60-75% versus one year earlier.
- The upsurge in fertilizer prices hinders Malawi's ability to achieve the national goal of increasing fertilizer applications, most notably through the Agricultural Input Program (AIP).
- The main drivers of domestic fertilizer price increases come from the global market – 90% of the increases in domestic fertilizer prices are attributable to increases in global prices for fertilizer and fuel, and a weakening of the Malawi Kwacha.
- Domestic margin increases explain the remaining 10%, though this is also driven by higher transport costs associated with higher global prices for oil and fuel.
- Increased global fertilizer demand (and thus prices) is driven primarily by increased food prices, stemming partly from many countries rebounding from Covid-19 while global food supplies are lower than usual.
- The expansion of agricultural area, good weather in major production regions, and rising input costs are also affecting global fertilizer prices.
- The fertilizer price surge is most likely a temporary phenomenon but will not recede before the upcoming agricultural season.
- Neither reducing the scope of the AIP (e.g., eliminating seed subsidies) nor circumventing the private sector to obtain fertilizers will reduce costs sufficiently to maintain current fertilizer subsidy levels, and could exacerbate the crisis.
- Any near-term response will require making difficult choices about how to distribute the burden of rising prices by either reducing the number of beneficiaries, reducing the value of the subsidy, or increasing the burden on the Treasury.
- In the long run, Malawi can reduce its vulnerability to global fertilizer price volatility by investing in infrastructure, improving fertilizer efficiency through research and extension, and identifying alternative strategies for improving Malawian land productivity.

Introduction

As the 2021/22 agricultural season begins, Malawi's policy makers and farmers are alarmed by recent spikes in domestic fertilizer prices.¹ August 2021 retail prices for NPK and Urea are 60-75% higher when compared to one year earlier.^{2,3} About 70% of the national

fertilizer supply is consumed by the smallholder sub-sector, mostly supplied through the government's Agricultural Input Program (AIP) and its predecessors.² The rise in fertilizer prices, therefore, is both a food security and economic problem for farmers, as

Table 1: Drivers of Urea Price Change in Malawi

<i>Price components</i>	Year		Percent change	Share of retail price change attributable to component
	2020	2021		
a) World (US) price (\$/mt)	214	442	106%	51%
b) Transport to Malawi (\$/mt)	264	358	36%	21%
c) FOB Malawi (\$/mt) = (a+b)	478	800	67%	-
d) Exchange rate (MWK/\$)	731	802	10%	10%
e) Interaction effects between c & d	na	na	na	7%
f) FOB Malawi (MWK/50kg)=(c*d)/20	17,471	32,140	84%	-
g) Domestic margin (MWK/50kg)	4,571	6,258	37%	10%
h) Retail price (MWK/50kg)	22,042	38,318	74%	100%

Sources and notes by row: a-World prices are from the World Bank Pink Sheet. b-Transport to Malawi cost comprises sea freight, port taxes, insurance, bagging, trucking, storage/handling, 1% Malawian import taxes, and 4% financing costs; figures for 2020 from Mangisoni (2021); the 2021 value increases freight and trucking by 59% reflecting the same 59% increase in Brent crude price over the same period. Bagging costs are assumed constant and all other costs are computed at the same percent of FOB port as in 2020. d- www.oanda.com. e-E.g., the increase in FOB Malawi price alone (exchange rate constant) would account for 73% of the total increase; increasing exchange rate alone would account for 10%, but when both FOB Malawi price and exchange are changed, the difference accounts for 90% of the total change in retail price. g-Domestic margin in 2020 includes \$20/mt in-country transportation, 5% operation margins, and 5% retailer margins Mangisoni (2021); the 2021 value increases transportation by 59% reflecting oil price change over the same period.

well as a policy problem for government, which will be strained to maintain subsidy levels.

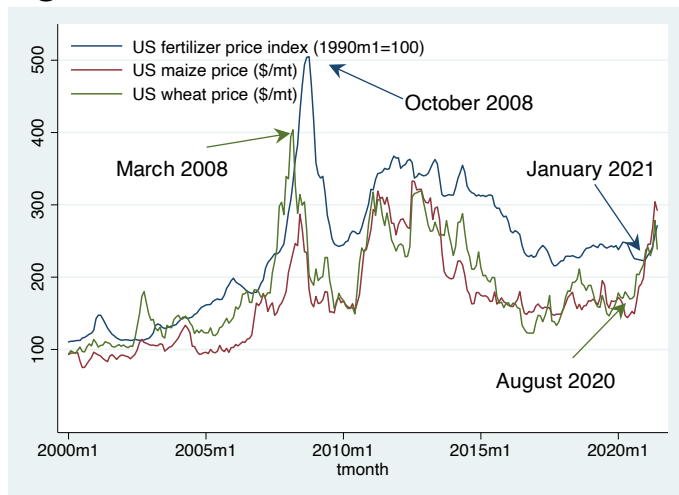
Given the scale and scope of implications of the recent fertilizer price increases, it is worth examining the factors that have driven it, what can be expected going forward, and the policy options to mitigate the negative effects in the near term and minimize vulnerability moving forward. Specifically, this Policy Brief highlights the global and local factors driving fertilizer price spikes and their relative importance. While some of the factors are outside the control of the country, others can be addressed in the longer-term.

Global Drivers

By far, the primary drivers of fertilizer price increases in Malawi have been changes in the global market. For example, using the case of urea, we estimate that 90% of the change in domestic retail maize prices are attributable to external factors like changes in the world fertilizer price, transport costs or exchange rates (Table 1). There are several underlying factors affecting global costs that have ultimately caused the current spike Malawians see in fertilizer prices.

First, the global rise in fertilizer prices, follows the global rise in food prices. That input and

Figure 1: World Food and Fertilizer Prices



Source: USDA

output prices are intrinsically linked, and that causality can flow both ways is not surprising. While it may seem more intuitive that rising fertilizer prices could lead to higher food prices, this is not the first time the direction of causality has been reversed.

Figure 1 shows world prices (Free on Board-FOB US Gulf, specifically) for maize (red) and wheat (green) in nominal dollars per metric tonne. A fertilizer price index (blue) is also shown, based on farmer surveys of prices paid in the US where January 1990 is pegged at 100. These can effectively be thought of as representative of world prices.

In the wake of the 2008 financial crisis, FOB Gulf wheat prices peaked in March at nearly \$400/mt. Maize prices peaked shortly after (in June). Following the food price spike, fertilizer prices peaked in October of 2008 at nearly 500% of their 1990 index value.

This occurs because higher food prices incentivize greater production of food, hence greater demand for inputs like fertilizers. In the short run, fertilizer production can't increase

and in the lag between demand shifts and supply adjustments, prices will rise.

A similar effect is evident now. Around August 2020, world food prices began to climb (Figure 1). The climb in fertilizer prices that began in January may thus largely be a natural response.

In turn, the rise in global food prices can be attributed to several coinciding events:

- i) As the global economy rebounds from the negative impact of the covid-19 pandemic, demand for maize and soybeans from the United States and the China has surged. Consumers in these and other recovering economies are beginning to increase spending just as livestock herds are re-growing, increasing demand for feed, all of which puts upward pressure on food prices.⁴
- ii) Many countries in South America – a major region for the global production of grain and legumes – have produced less than usual due to weather and covid-19 related shocks.⁵
- iii) Around the world, governments are acting to assure national food security and self-sufficiency as a precaution against the possibility of future or continued covid-related lockdowns.⁶
- iv) The weakening of the dollar against the major currencies has also contributed to stimulated global demand for maize and soybeans at the world market.⁵

In addition to rising food prices, fertilizer demand increases are being driven by

expansion in area under maize and soybeans cultivation and improved weather conditions in India, the USA and Latin America.⁶

Finally, there has been an unexpected spike in the prices of the raw materials for manufacturing fertilizers related to supply shortfalls⁷ and rising energy costs. Brent crude oil prices, for example, are up 59% year-on-year in August 2021.⁸ Energy cost increases have compounded effect on fertilizer prices in Malawi, in fact, as it impacts both transportation and production costs (especially for nitrogen).

Local drivers

We estimate only 10% of the year-on-year price increase in Malawian fertilizer price is attributable to changes in the margin between the domestic landed and retail prices. As such, there is little, if anything, to be done in the near-term to substantially mitigate the effects of underlying factors driving the fertilizer price increases by focusing on domestic margins.

To be clear, domestic margins are nominally high – by our best estimate accounting for 15-20% of the domestic retail price. This reflects estimated gross margins of 5% for both wholesalers and retailers, and within-Malawi transport costs between \$20 and \$32 per tonne. These margins are feasibly consistent with a competitive market in both years, and the rise in transportation costs is based entirely on changes in oil prices.

So, while the domestic price margins may be nominally high, the *change* in domestic price margins – from MWK 4,600 to MWK 6,250 between 2020 and 2021 – does not suggest any change in competitiveness in the fertilizer

sector and is a minor component of the overall price spikes.

Policy response options to fertilizer price spikes

Being primarily driven by outside forces, the fertilizer price spike is most likely a temporary phenomenon. If the current wave of food demand recedes and the market supply of food increases – partly facilitated by the current upsurge in fertilizer demand – food prices will regress to more “normal” levels and fertilizer prices will follow.

The unfortunate and unavoidable fact, however, is that this temporary phenomenon is dramatically escalating fertilizer prices at precisely the time when Malawi most needs fertilizer, and no change is likely before the upcoming agricultural season.

The most immediate concern for the Government of Malawi is the implication of the global fertilizer price spike for the second season of the AIP.

Reducing the scope of the AIP – e.g., removing subsidies for maize and legume seed – is not likely to save enough in costs to allow for sustaining fertilizer subsidy levels at current prices.

Also, one very important implication of the fact that the fertilizer price surge is not just a Malawian phenomenon is that circumventing the private sector – e.g., by reverting to the old system of government as direct-buyer – would not solve the problem. Any buyer, government or otherwise, will find it virtually impossible to land fertilizer in-country for much less than current prices. Moreover, such an approach could have detrimental long-term ramifications

for the private sector and risks delaying delivery. If unsuccessful, Malawi would face a very real risk of finding itself both in need of food to aid its people and a depleted treasury.

Near-term Options

There are no feasible responses for the upcoming season that maintains the 1) number of AIP beneficiaries, 2) the level of support for each beneficiary, and 3) the overall costs. Eliminating the shock of the fertilizer price spike is not possible because most of the cost is incurred before any fertilizer reaches Malawian borders. The only choice in the near term is how to distribute the shock between these three components of the AIP – i.e., to reduce the number of beneficiaries, reduce the value of the subsidy, or increase the overall cost to treasury.

In any event, the government must act quickly if it is to ensure AIP fertilizers are available in time to be used efficiently – late application dramatically reduces yield response and would exacerbate the current economic stress.

If the chosen approach, whatever it is, includes fewer beneficiaries or leads to less fertilizer use, forward looking planning to address the possibility of an upcoming production shortfall cannot start too soon.

It may also be time to urgently encourage farmers to adopt alternative fertilizers and/or compliments to chemical fertilizers (e.g., proven organic fertilizers, manure or compost applications, maize-legume intercropping, timely weeding, etc.).

Long-term Options

There are several steps that could be taken in the longer-run to minimize Malawi's vulnerability to future fertilizer price volatility.

Firstly, infrastructure investment could lower transportation costs. Infrastructure is expensive, but the payoffs are long-lasting. Major investments are also feasible. For example, the budgeted cost of AIP is over MWK 100 billion for 2021, a decline from 2020. For less than the cost of 4 years of AIP at this rate, the same spending could rather add between 1,000 and 2,500 km of all-weather roads (compared to the current national network of fewer than 7,000 km).⁹

A second option to reducing the costs of fertilizer use is to increase the benefits – that is, work with farmers to improve the yield response to fertilizers. The effectiveness of fertilizer use on Malawian farms, for a variety of reasons, is well below agronomic potential.¹⁰

A holistic program for improving soil health and the efficiency of fertilizer use could protect Malawi from damaging fertilizer price surges. The productivity of fertilizers could feasibly be double the current levels seen on Malawian farms or higher, balancing the impact of the present fertilizer price increases. There are also numerous ways to improve land productivity without using chemical fertilizers.

A wholistic program would require robust and sustained funding for research, development and extension, but again, the costs are not prohibitively high. For approximately 1/3 of the proposed spending for the 2021/22 AIP, government could have added 10 research officers at the station in Chitedze, and

recruited and trained over 4,000 extension officers, equipping each one with a new motorcycle, fuel and funds to operate it, and everything needed to run a demonstration plot for improved management.⁹ This would more than triple the government's current research and extension capacities.

Lastly, given the high margin between global and Malawian fertilizer prices – which is not unusual for a landlocked country – it may be sensible to incentivize domestic fertilizer production. That said, fertilizer production also requires inputs that may need to be imported – phosphates and natural gas, for example. Also, converting atmospheric nitrogen into a form usable as fertilizer requires a great deal of energy, which is also relatively expensive in Malawi. In short, it is not immediately obvious that domestic production would be cost effective.

1 – <https://www.voanews.com/africa/malawi-president-pledges-intervene-fertilizer-price-rise>

2 – Mangisoni, J.H. 2021. “Structure-Conduct-Performance of the Fertilizer Market in Malawi.” Report prepared for MwAPATA Institute & LUANAR Department of Agricultural and Applied Economics.

3 – Authors' computation based on secondary sources (see Table 1, for example).

4 – World Bank. 2020. *Global Economic Prospects*, The World Bank. Washington, DC.

5 – World Bank Press Release, April 2020: <https://www.worldbank.org/en/news/press-release/2021/04/20/commodity-prices-to-stabilize-after-early-2021>

6– IFA (International Fertilizer Association). 2020. “Short-Term Fertilizer Outlook 2020-2021”. Public Summary of IFA Virtual Strategic Forum, 17-19 November 2020

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