Global fertiliser price volatility – approaches to reduce vulnerability among countries in the Global South

Using Malawi and its agricultural subsidy programme as a case study, our authors demonstrate how global fertiliser price rises can affect domestic fertiliser prices. They also propose strategies countries can consider to lessen their vulnerability and the burden price rises pose on farm household food security and the stability of national economies.*

By Christone Nyondo, Zephaniah B. Nyirenda, William J. Burke and Milu Muyanga

At the beginning of the 2021/22 agricultural season, in August, the retail prices for NPK (nitrogen, phosphorous, potassium) and urea fertilisers in Malawi were 60-70 per cent higher than in the preceding two and half years. Expert analysis of these price increases revealed that the primary drives were undoubtedly directly associated with changes in the world market fertiliser price. Just to give an example, our analysis showed that roughly 90 per cent of the movement in the retail fertiliser price of urea in the domestic market was directly linked to the changes in the world market price, transit costs, and exchange rate movements. Only 10 per cent of the domestic retail urea price was directly associated with internal factors, such as supplier margins and distribution costs. So since external factors are more important than internal factors in driving domestic fertiliser price volatility, they will continue having devastating effects on Malawian households and the economy as a whole, unless alternative strategies are implemented to mitigate these effects.

Access to fertilisers for small-scale farmers has been supported by the Government of Malawi for decades.

Photo: Jörg Böthling

The vast majority of countries in the Global South are agro-based. However, they depend on the global market for their supplies of fertilisers and other important production inputs because they have not yet developed the local capacity to produce these inputs. In the Malawian context, the agriculture sector accounts for roughly 28-30 per cent of the overall national economy. Smallholders constitute around 85 per cent of the farming community. As would be expected, roughly 70 per cent of the fertiliser supplied to Malawi via imports is directly consumed by these small-scale farmers – through the agricultural input subsidy programme.

Malawi's agricultural subsidy programme

The agricultural subsidy programme has historically been a central feature of Malawi's agricultural development programming. From time immemorial, the government has consistently incorporated different forms of this programme in its agricultural development plans to facilitate smallholder farmers' access to productive inputs, such as seed and inorganic fertilisers. Historically, the programme has primarily targeted resource-poor smallholder farming households with inputs for maize production to improve their household food security. In the 2005/06 agricultural season, the Government of Malawi introduced a second-generation, rationed and more targeted partial subsidy programme (the Agricultural Inputs Subsidy Program [AISP], and later the Farm Inputs Subsidy Program [FISP]) to provide seed and fertiliser for roughly 0.4 hectares of land per farmer. The programme provided access to 100 kilograms of fertiliser (50 kg NPK and 50 kg urea), 5 kg of hybrid maize seed or 7 kg of Open Pollinated Variety (OPV) of maize seed, and 3 kg of either groundnut, soya beans, pigeon peas, cowpeas or sugar beans seed at subsidised prices. NPK fertiliser is applied as a basal dressing fertiliser, after the germination of maize seed. Urea is applied approximately six weeks after the application of NPK to supply a higher rate of nitrogen (46 % N), when the maize starts maturing, to facilitate the process of turning N into maize grain. Tobacco, a key cash crop for Malawi, was also part of the programme during its maiden days. Tobacco was subsequently dropped to allow the programme to exclusively concentrate on household food and nutrition security objectives.

The FISP beneficiaries were identified through local government structures. The lo-

cal chiefs were given the authority to identify and recommend the beneficiaries to the central government through village forums. The local chiefs were backstopped by frontline agricultural extension officers in this process. The inputs were then administered to the identified beneficiaries through a paper-based voucher system. This system defined, allotted and controlled access to entitlement. Consistent with the main elements of the programme, the vouchers came in three types: fertiliser, maize seed and Flexi (for redeeming legume seed) coupons. For the fertiliser component of the programme, the subsidy rate roughly ranged between 60 and 90 per cent of the commercial price of a 50 kg bag of fertiliser. The household head was the only member of a particular household eligible for participation in the programme. However, evidence suggests that from time to time, some households had more than one beneficiary.

Applying alternative soil management interventions such as compost ought to be supported to lessen dependence of farmers on the global market of mineral fertilisers.

Photo: Jörg Böthling

In many respects, the introduction of a more targeted FISP was a major policy shift for the government. especially when preceding programmes aiming at facilitating smallholder farmers' access to productive inputs are put into perspective. For example, between 1971 and 1994, during the one-party state, the government made available subsidised inputs for maize production to the population of smallholder farmers through farmer clubs. After the introduction of multiparty democracy in 1994, the government moved away from a universal subsidy programme and started the "inputs for work" programme, where farmers offered their labour in return for an in-kind payment with farm inputs. Later, however, the government introduced "free or labour-based inputs distribution" programmes, such as the "Starter Pack" and "Targeted Inputs Program" (TIP) where farmers were provided farm inputs free of charge or in exchange for labour. Through the Starter Pack programme, the government distributed over three million input packs for maize and grain legumes production for roughly 0.1 hectares of land per farmer. The Starter Pack was a universal programme because it distributed enough packs to cover the population of smallholder farmers. The TIP was a scaled-down "Starter Pack" targeted at the poorest smallholder farmers with the same type and quantity of inputs. However, the Starter Pack and the TIP cannot necessarily be regarded as subsidy programmes because they either provided inputs for free or in exchange for labour. They are presented here to highlight the significant policy shifts that took place prior to the introduction of the FISP in 2005.

During the 2020/21 agricultural season, another policy shift took place after the election of a new national government which introduced the Affordable Inputs Programme (AIP) to replace the FISP. The AIP scaled down the scope of inputs in the programme but expanded farmer coverage. It currently exclusively focuses on providing inputs for maize production (i.e. inorganic fertilisers and improved seed), sorghum and rice, and goats to a limited extent. The AIP expanded farmer coverage to the population of smallholder farmers (3.7 million) in its maiden year before scaling down to 2.5 million farmers in the ensuing years. The FISP targeted between 0.9 and 1.6 million smallholder farmer households across the 2005 to 2020 period. The other difference between the AIP and the FISP is that access to inputs in the AIP is controlled using a biometric identification system built around national identity cards (IDs). The voucher-based identification system that dominated during the FISP period was replaced by the biometric identification system after noting that the former had effectively failed to eliminate the diversion and leakage of inputs to secondary markets. This background clearly demonstrates how, to a large extent, small-scale farmers in Malawi will continue relying on government subsidies to access inputs. It also shows how any factor that disrupts these supplies, be it e.g. surging fertiliser prices or scarcity of fertilisers, disrupts the ability of small-scale producers to access fertilisers and erodes their potential to contribute to the sector and their food security situation.

Drivers of global fertiliser price surges

One of the principal drivers of the global fertiliser price surges in 2021, which also had a direct bearing on the domestic retail fertiliser prices in Malawi, was the global rise in food prices. These rises were attributed to several factors, including the rebounding of the global economy to the negative effects of the Covid-19 pandemic, poor grain harvests in South America due to weather and Covid-19-related shocks, and the weakening of the US dollar against major currencies that stimulated the demand for maize and soybeans. The effect of these price rises on fertiliser prices demonstrates the inherent linkages and reverse causality that exist between input and output prices. A global sharp rise in maize and soybean prices in 2021 incentivised producers, especially in the major producing regions of the world, to produce more of the two commodities, thereby inducing greater demand for fertilisers.

These shifts in fertiliser demand inevitably led to fertiliser price spikes since fertiliser prices could not adjust at the same pace as price rises because of relatively longer time lags that are typically required to accommodate production capacity adjustments. Obviously, the extent to which these global fertiliser price spikes affected countries in the Global South depended on their individual level of reliance on global fertiliser supplies. The other important driver was the unexpected rise in the prices of raw materials for manufacturing fertilisers, due to supply

shortfalls, and rising energy costs, especially for oil and gas prices. For example, crude Brent oil prices rose up to 59 per cent year-on-year in August 2021. Gas prices also rose to an all-time high due to an unusually cold winter in Europe. These energy price rises aggravated the production costs of nitrogen fertilisers, for fertiliser manufacturing countries, and the landing costs for net importing countries, such as Malawi.

How can the countries of the Global South become more independent?

Obviously, the precarious fertiliser price situation that countries in the Global South were in since the beginning of the agricultural season in 2021 was deepened by the onset of the Russia-Ukraine war in February 2022. However, to a certain extent, the level of exposure to this compounded shock depended on the level of exposure of individual countries to world market fertiliser supplies (and possibly to the level of land-lockedness). As already alluded to, the vast majority of countries in the Global South were naturally pre-disposed to these shocks because they are net importers of fertilisers. Moreover, the fact remains that every year these countries have to import large quantities of fertilisers, mostly from the world market, to feed their fertiliser-intensive agro-based economies. Unfortunately, the primary drivers of fertiliser price surges in their domestic markets are outside their direct control. Hence, they have to bear the full consequences of these shocks in the absence of alternative interventions.

Having said that, these countries can implement several short-, medium- and long-term strategies to reduce their vulnerability to global price surges and improve nutrient use efficiency of the fertilisers that are accessible to them. In the short to medium term, they could consider encouraging farmers to progressively improve inorganic fertiliser use efficiency by promoting cost-effective complementary interventions that holistically address soil fertility, soil health, and soil and water conservation issues. This is particularly important for countries such as Malawi that are experiencing falling crop response rates to fertiliser due to poor soil biology (e.g. low soil carbon), poor soil chemistry (e.g. unconducive soil pH), poor soil physics (e.g. sandy soils), and poor farm management practices. Estimates by soil scientists suggest that these poor soil properties have led to Malawian smallholder farmers to be only getting roughly 6 kg of maize grain per 1 kg of nitrogen, on average, relative to the regional benchmarks of 35-37 kg maize/kg N because they inhibit the ability of maize plants to convert N (a key constraint in Malawian soils) into maize grain. Therefore, integrating alternative soil fertility management interventions that increase soil carbon in particular, reduce soil erosion and improve soil fertility in general, can significantly improve crop response rates to N. Examples of such interventions include the integration of organic fertilisers, livestock manure and/or compost into inorganic fertiliser production systems, the promotion of conservation agriculture practices, maize-legumes models and crop-livestock models, among others, to organically improve soil fertility. In the just ending 2022/23 agricultural season, we have already observed an increasing proportion of farmers integrating organic fertilisers, livestock manure and compost into their farming systems because of their inability to economically access adequate quantities of inorganic fertilisers owing to surging prices.

However, we believe the most cost-effective way is for farmers not to integrate these alternative fertilisation practices as substitutes for inorganic fertilisers but to use them to complement the inorganic fertiliser they are able to access. This is because most of these alternatives are habitually low in N concentration. Authorities should take advantage of farmers' willingness to reduce their dependence on inorganic fertilisers by swiftly moving in to promote this integration. Secondly, more investment should be put into agricultural research and extension services to strengthen extension support, and research into complementary fertilisation options as one way of improving the productivity of land, labour, and other agricultural inputs. Much research will be required to create and standardise such complementary fertilisation options to ensure that farmers are not given a raw deal by, for example, producers of organic fertilisers. Also, farmers will need considerable support from extension services to apply those alternatives correctly. Third, the government should consider designing a more streamlined and flexible subsidy programme that tailors its support to the different farmer and ecological needs. This approach has already been piloted in Zambia, where farmers were given the flexibility to access the inputs they need for their crop and/or livestock enterprises. The pilot proved to be more cost-effective and efficient in addressing farmers' needs.

In the long run, the government should consider incentivising the domestic production (and blending) of the area- and crop-specific fertilisers, especially for fertilisers that can be produced locally (e.g. NPK fertilisers) to address the critical nutritional needs of crops. Because of agro-ecological differences and spatial variations in the quality of soils for crop production, the government, through its National Fertilizer Policy of 2021, is promoting the production and blending of area- and crop-specific fertilisers to address the nutritional needs of various crops and agro-ecological zones. However, what remains is to fully incentivise the private sector to be able to actively play this role. Moreover, it would not be sensible for Malawi to produce certain types of fertilisers (e.g. urea) locally because it does not have a comparative advantage. Thus, for fertilisers where it will not be cost-effective for domestic production, Malawi should consider entering into a joint venture with more efficient countries or pushing for a regional project, where such an approach makes sense, to manufacture and distribute the fertiliser regionally. This would increase the economies of scale for fertiliser manufacturers participating in such ventures.

Christone Nyondo is an agricultural economist and technical lead of the fertiliser and soil health working group at MwAPATA Institute, a Malawi-based indigenously led agricultural policy think tank that responds to applied policy issues within agriculture, natural resource management and rural development. Prior to joining MwAPATA, Christone held various senior positions within Malawi's Economic Common Service (ECS).
Zephania Nyirenda, also an agricultural economist, is a Research Analyst at MwAPATA Institute. Previously, he worked as a Policy Research Analyst for the New Alliance Policy Acceleration Support (NAPAS) project in the Ministry of Agriculture and as a Research Analyst at the International Food Policy Research Institute (IFPRI).
Milu Muyanga is a professor of international development in the Department of Agricultural, Food and Resource Economics at Michigan State University (MSU)/USA and a Principal Investigator at MwAPATA. He previously worked as a Research Fellow with Tegemeo Institute, Egerton University in Kenya, and as an Economist in the Kenyan Ministry of Planning and National Development.
William Burke is an agricultural economist with 20 years experience working in Africa, a professor in the MSU Department of Agricultural, Food and Resource Economics and a Principal Investigator and former Acting Research Director at MwAPATA Institute.
Contact: c.nyondo@mwapata.mw

** The article is based on a policy brief that MwAPATA Institute published in 2021 in response to the sudden and unexpected global surge in fertiliser prices.*

References: **www.rural21.com**