

COUNTRY BRIEF 12

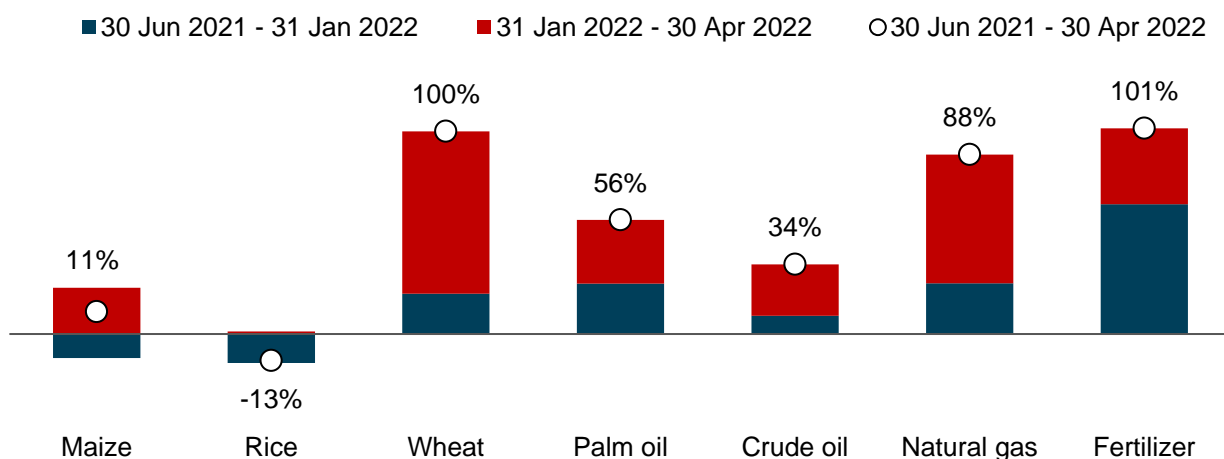
Uganda: Impacts of the Ukraine and Global Crises on Poverty and Food Security

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1. World Price Shocks and Domestic Price Transmission

Global food, fuel, and fertilizer prices have risen rapidly in recent months, driven in large part by the fallout from the ongoing war in Ukraine and the sanctions imposed on Russia. Other factors, such as export bans, have also contributed to rising prices. Palm oil and wheat prices increased by 56 and 100 percent in real terms, respectively, between June 2021 and April 2022, with most of the increase occurring since February (Figure 1).

Figure 1. Changes in global real commodity prices since mid-2021 (US dollars)



Source: Authors' calculations using data from World Bank Commodity Price Data (The Pink Sheet, <https://www.worldbank.org/en/research/commodity-markets>).

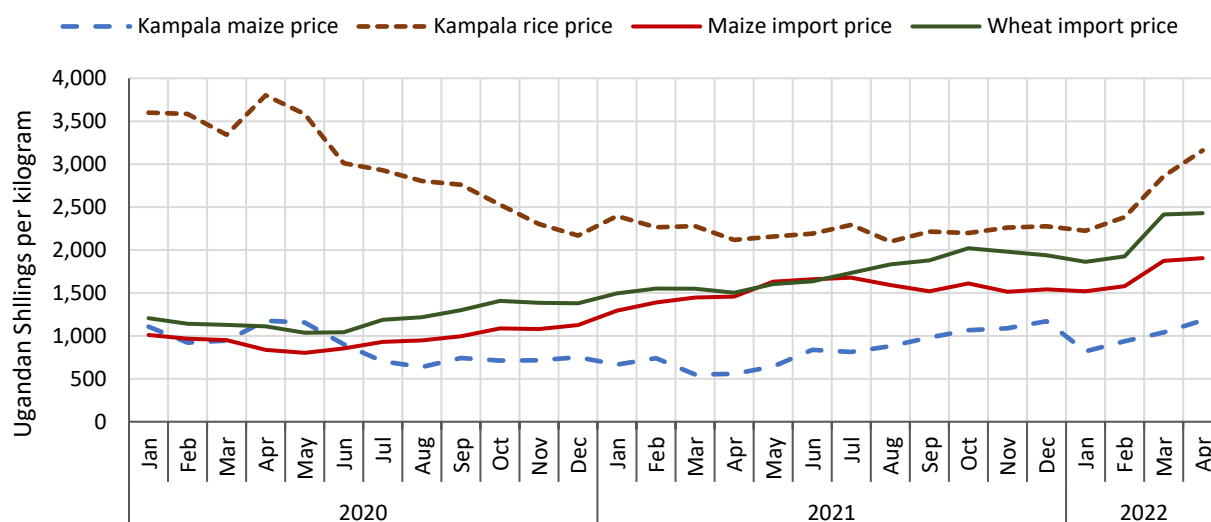
Note: Nominal prices in US dollars from World Bank Commodity Price Data (The Pink Sheet) are converted to real prices, which account for the overall increase in world prices over this period deflated by the US consumer price index, which rose by 7.2 percent between June 2021 and April 2022.

¹ This study was conducted by IFPRI with financial support from BMGF, FCDO, and USAID. The study uses models developed with ongoing support from BMGF, USAID, and CGIAR's Foresight and Metrics Initiative. For further information, please contact Paul Dorosh (p.dorosh@cgiar.org) and James Thurlow (j.thurlow@cgiar.org).

Wide variation exists across products, with real maize prices increasing by only 11 percent, and rice prices declining by 13 percent. The price of crude oil and natural gas has also risen substantially, while the weighted average price of fertilizer has doubled. With these changes in global prices, many developing countries and their development partners are concerned about the implications for economic stability, food security, and poverty.

A comparison of estimated import costs with prices in Uganda's capital city, Kampala, suggests that world price changes may have been transmitted to some extent to local markets. For example, the wholesale price of maize in Kampala rose 41 percent and rice prices rose 33 percent between February and May 2022, while over the same period, the estimated cost of imported maize rose by 20 percent and the price of imported wheat rose by 31 percent (Figure 2).

Figure 2. Nominal maize and wheat prices in Uganda, 2020–2022



Source: Authors' calculations using data from WFP, IGC, and World Bank Commodity Price Data (The Pink Sheet).

Note: Import prices include cost, insurance, and freight (CIF).

2. Measuring Impacts on Uganda's Economy and Population

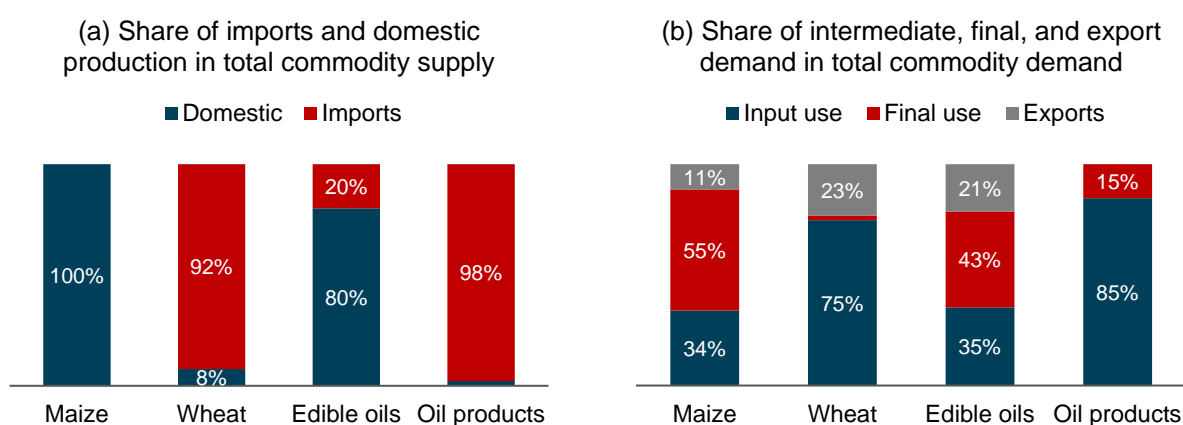
We use an economywide model of Uganda to estimate the impacts of the global price shocks on all sectors, workers, and households.² The model allows us to capture a range of considerations that determine the overall impact of the crises on the country. For example, the effect of higher world prices on Uganda's economy depends on the importance of the affected products in the total supply of each commodity and whether local producers and consumers can readily substitute away from higher-priced imports. Uganda is a maize exporter and its supply of maize all comes from domestic production. On the other hand, most wheat grains are imported, accounting for more than 90 percent of total supply of wheat gains (Panel A in Figure 3). On the use side, maize exports account for about 10 percent of total maize use (Panel B in Figure 3). Since wheat supply is dependent on imports and maize is exported, we expect changes in world wheat and maize prices both to have effects on their domestic prices. Uganda imports edible oils (such as palm oil) but exports oilseeds. Edible oil imports account for 20 percent of total supply of edible oilseeds and products (Panel A in Figure 3), while oilseeds have a similar share in total use of edible oilseeds and products (Panel B in Figure 3). Thus, we expect rising world prices for edible oils to affect both exports and domestic

² Information on the Rural Investment and Policy Analysis (RIAPA) data and modeling system can be found [here](#).

production of oilseeds and products, benefiting oilseed farmers as imports are close substitutes for domestically produced and consumed edible oils.

Almost all oil products (crude oil and processed petroleum) used in Uganda are imported. However, the impact of higher oil prices on households cannot be directly assessed by looking at the share of petroleum products in household consumption baskets. This is because oil products are primarily used as inputs into the production of other goods and services, with inputs accounting for 85 percent of total demand for oil products in Uganda (Panel B in Figure 3). Most petroleum products, for example, are used by the transport sector, the cost of which affects the price of all marketed goods and services in the economy. IFPRI's model tracks the flow of domestic and imported inputs between sectors and estimates the net effect on final product prices.

Figure 3. Breakdown of commodity supply and demand in Uganda, 2019

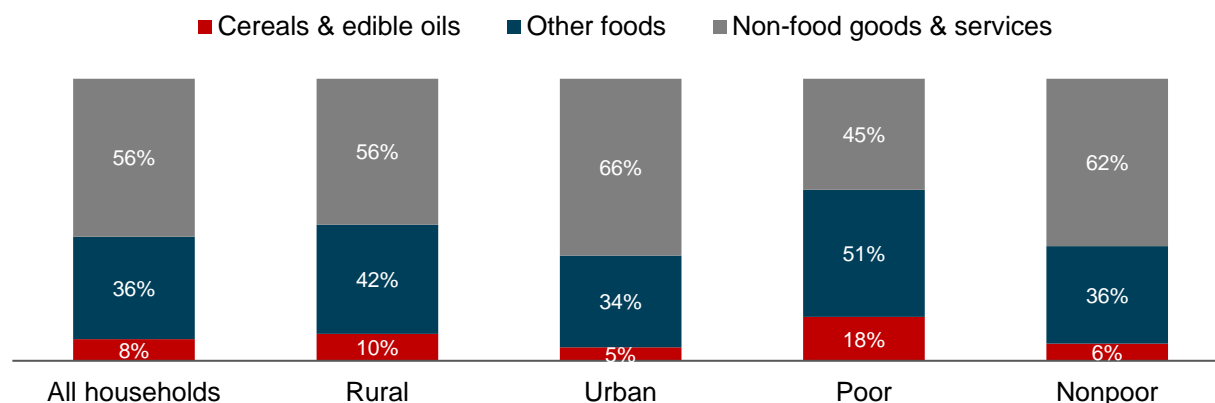


Source: Authors' calculations using social accounting matrix (SAM) data from IFPRI's Uganda RIAPA model.

Note: Wheat includes wheat grains and flour, and edible oils include edible oilseeds in Panel B. Input use includes grains as intermediates in flour processing, and grain flours can also be used as intermediates in the production of other processed foods (excluding flours), and by some service sectors such as restaurants and hotels. Final use includes private and public consumption and gross capital formation. Wheat exports are the reexports to neighboring countries, and Uganda grows only a modest amount of wheat.

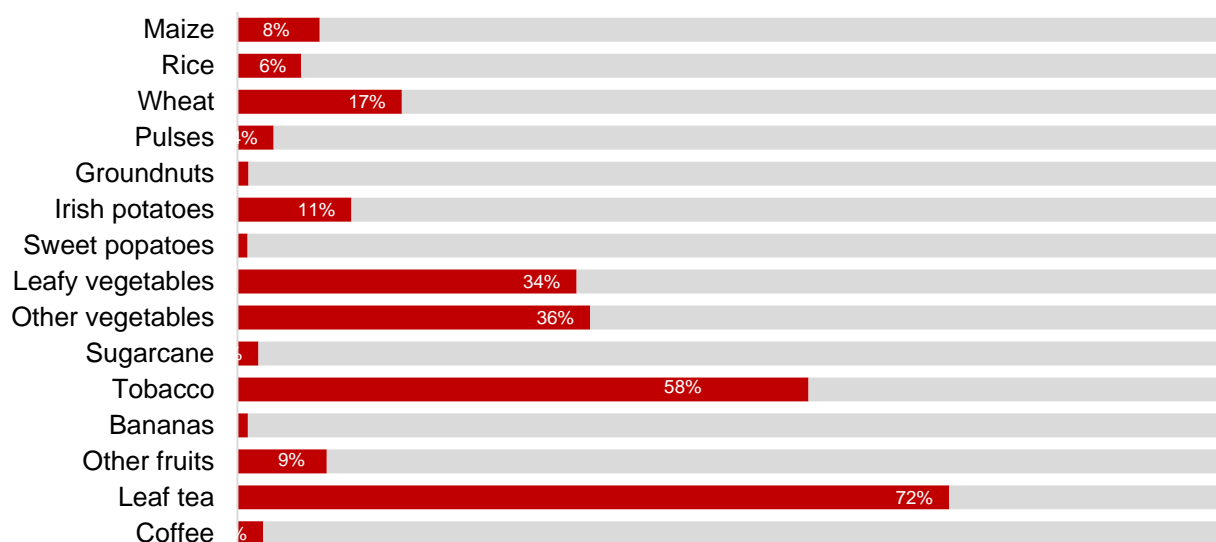
Impacts on households also depend on the importance of commodities in their consumption baskets. Cereals and edible oils make up a small part (8 percent) of the total value of household consumption in Uganda, which is less than one-fifth of total food expenditures, as plantains and root crops are more important staples for Ugandan households (Figure 4).³ IFPRI's model also tracks income and expenditures for different population groups and is linked to a survey-based micro-simulation tool that tracks the consumption patterns of individual households. Unpacking populations is crucial because cereals and edible oils are more important for poorer households in Uganda than for other groups.

³ These figures include the imputed value of home consumption, which is also tracked within the RIAPA model.

Figure 4. Composition of household consumption spending in Uganda, 2019

Source: Authors' calculations using social accounting matrix (SAM) data from IFPRI's Uganda RIAPA model.

Rising fertilizer prices may cause some farmers to reduce their use of this input, leading to lower agricultural production and higher food prices. The magnitude of this decline depends on (1) the responsiveness of fertilizer demand to changes in prices; (2) the amount of fertilizer currently used to grow crops; and (3) the expected productivity losses for farmers who reduce their use of fertilizers. Fertilizer adoption in Uganda is extremely low for starchy staples, such as plantains and cassava. Only 8 percent of maize land is cultivated using fertilizers, but the fertilizer adoption rate is higher for cash crops such as tobacco and tea. The amount of fertilizer used on different crops also varies. For our initial impact analysis, we adopt a conservative set of assumptions regarding farmers' response to rising fertilizer prices. We assume an own-price elasticity of fertilizer demand of -0.15 , implying that a 100 percent increase in real fertilizer prices leads to a 15 percent decline in fertilizer use. Drawing on recent survey analysis, we assume that farmers who do not use chemical fertilizers are about 20 percent less productive than farmers who do.⁴

Figure 5. Share of cropland using chemical fertilizers in Uganda

Source: Authors' calculations using Uganda National Panel Survey 2019/20.
https://microdata.worldbank.org/index.php/catalog/3902/study-description#metadata-data_access

⁴ The final impact on crop productivity is: [Change in domestic market price] × [Price elasticity of demand] × [Share of cultivated land using fertilizer] × [Productivity gain from using fertilizer per hectare].

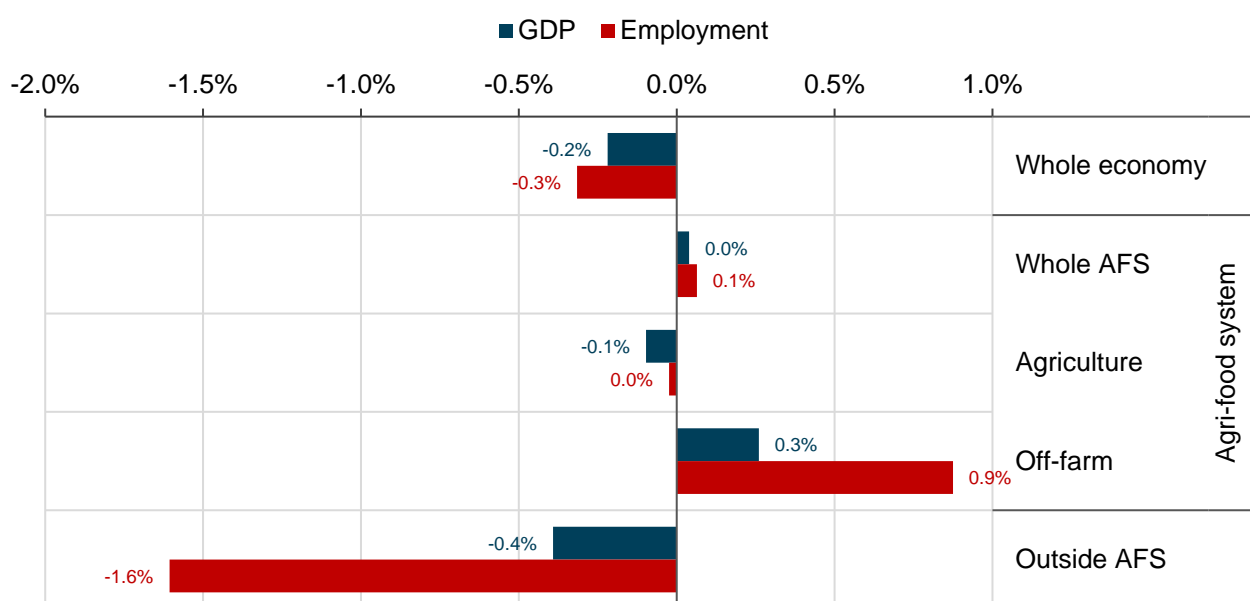
Root crops and maize are planted in February and March in the wetter, southern half of Uganda, with harvests of maize about four months later. Sorghum and millet, which dominate cropping systems in the drier north of the country, are typically planted a few months later, in April and May. Wheat is a minor crop, grown mainly in the highland areas. Thus, the surge in fertilizer prices in early 2022 was early enough in the season to potentially lead to a significant reduction in fertilizer use, though initial levels were low. The link between world fertilizer prices, local fertilizer use, and agricultural productivity is, nonetheless, an important impact channel for the current crisis.

We simulate the effects of both higher world prices (recall Figure 1) and the potential productivity losses from reduced fertilizer use in the current growing season. Simulation results should be interpreted as “medium-term” impacts, that is, after the immediate spillover effects across sectors and households have occurred, but before the government and private sector make significant changes to their investments and policies in response to the crisis (see Section 5 for next steps).

3. Impacts on Uganda’s Economy and Agrifood System

The effects of the world price and fertilizer demand shocks on GDP and employment are modest. Real GDP falls slightly, by 0.2 percent, and the decline in total employment is also small, at 0.3 percent (Figure 6). Uganda exports maize, oilseeds, and some other agricultural commodities, and it also produces a small amount of crude oil and oil products. These two factors explain why the global price shocks have only a modest impact on the overall economy. The agrifood system is also largely unaffected for the same reason. Moreover, off-farm agrifood GDP and employment benefit from the shocks, mainly in agricultural export-related services. Outside of the agrifood system, GDP and employment fall more in percentage points than the total economy, and agrifood export-related services seem to compete with off-farm jobs outside of the agrifood system, as in net, total employment falls slightly.

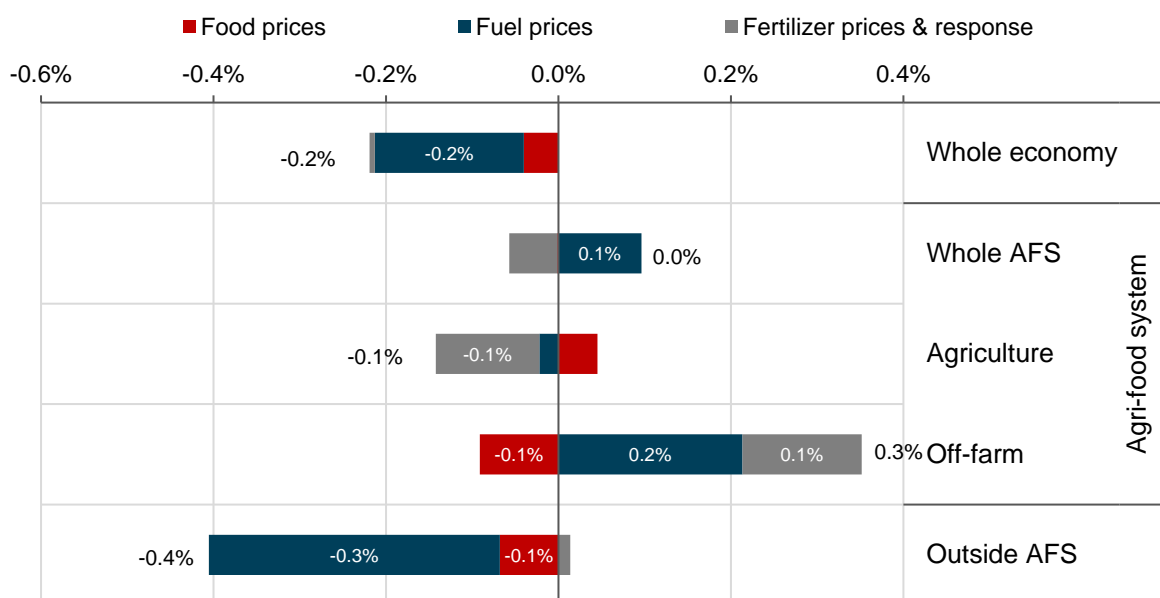
Figure 6. Percentage change in GDP and employment due to food, fuel, and fertilizer shocks



Source: Simulation results from IFPRI’s Uganda RIAPA model.

Fuel shocks are the main drive of the decline in national GDP. There is a modestly negative effect from rising food prices on total GDP, while the main driver of GDP losses is the fuel shock (Figure 7). The negative effect of fertilizer shocks can only be seen on primary agricultural GDP, but that impact is still modest, mainly because of very low fertilizer adoption for many large crops in Uganda (recall Figure 4). Off-farm agrifood GDP benefits from fuel and fertilizer shocks, as they benefit Uganda's agricultural exports and related service activities through the depreciation of real exchange rates. On the other hand, GDP losses outside of the agrifood system are largely driven by higher fuel prices, which raise transaction costs and market prices, and reduce consumer demand.

Figure 7. Percentage change in real GDP decomposed by food, fuel, and fertilizer shocks

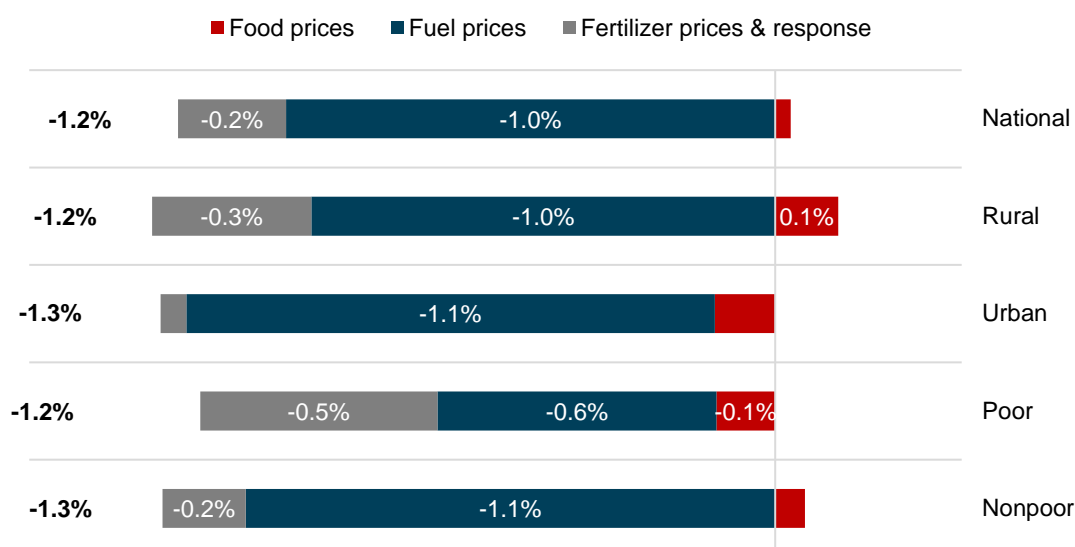


Source: Simulation results from IFPRI's Uganda RIAPA model.

4. Impacts on Household Poverty, Inequality, and Diets in Uganda

Household consumption falls similarly in both rural and urban areas. National consumption spending, including the value of home consumption, falls by 1.2 percent (Figure 8). The percentage decline in consumption is larger than that in GDP because households are hit twice, by rising prices and falling incomes. Most of the decline in consumption in Uganda is driven by the fuel price shock, which raises the market price of most consumer goods and services in the economy. There is little difference in overall consumption outcomes across population groups. However, the drivers of the consumption declines differ slightly between rural and urban households. While the fuel shock is the main driver for falling consumption across all household groups, the fertilizer shocks have a negative effect on the poor and rural households that also benefit more from rising food prices. This is because rural households earn more of their income from farming and are therefore adversely affected by the decline in agricultural production following the increase in fertilizer prices. Poor households, including those in urban areas, are also affected by the indirect effects of the fertilizer shock on food supply. On the other hand, poor and rural households consume mainly locally grown foods whose prices are less affected by rising import food prices. Higher food prices benefit rural households, many of which are also in the group of poor households, as the domestic prices of maize and oilseeds rise in response to higher export prices for these commodities. Nevertheless, for rural and poor households, gains from rising food prices are offset by the reductions in consumption in response to the higher fuel and fertilizer prices.

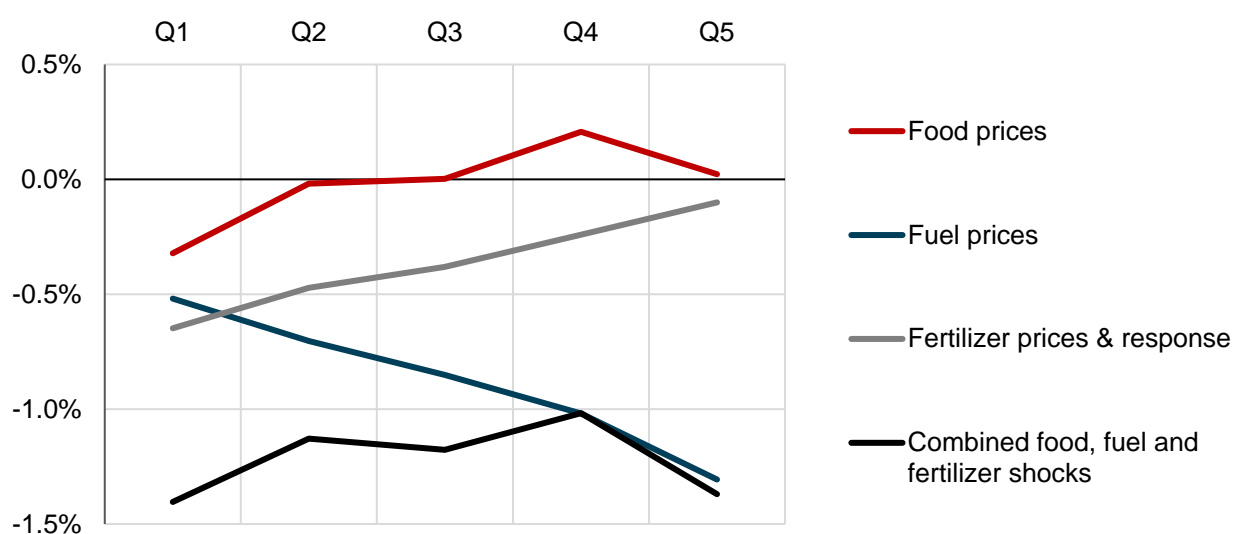
Figure 8. Percentage change in real household consumption due to food, fuel, and fertilizer shocks



Source: Simulation results from IFPRI's Uganda RIAPA model.

Inequality is not greatly affected, but all households are adversely affected. The increase in fuel prices is the largest shock for all households, while consumption losses are larger for households in the top quintile (Figure 9). Conversely, the fertilizer shock is most detrimental for poorer households, which rely more heavily on agriculture for their income and spend a larger share of their incomes on food. Finally, real consumption is not negatively affected by food price shocks for most household groups, and consumption falls slightly only for households in the lowest quintile. Overall, the combined effect of the world price shocks has little impact on income distribution in Uganda, with a decline in consumption across all household groups.

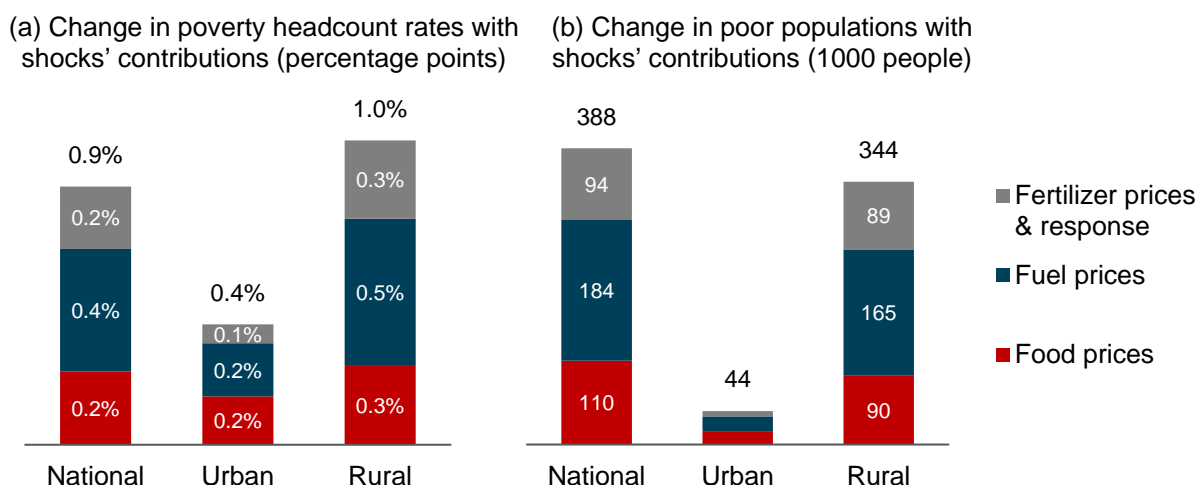
Figure 9. Percentage change in real household consumption across per capita expenditure quintiles



Source: Simulation results from IFPRI's Uganda RIAPA model.

Falling household consumption leads to a slightly higher poverty rate, particularly in rural areas. According to the most recent household survey in Uganda, about 40 percent of the country's population has an adult equivalent consumption level that falls below the US\$1.90 international poverty line. The increase in world prices raises the national poverty headcount rate slightly, by 0.9 percent percentage points, in Uganda (Panel A in Figure 10), which is equivalent to an additional 388,000 people falling below the poverty line (Panel B). Most of the increase in poverty is caused by the fuel shock. This is consistent with the consumption changes for poor households shown in Figure 8. Impacts on the rural poverty rate are larger than on urban poverty rate, and the absolute increase in the poor population is almost all in rural areas, although this partly reflects Uganda's smaller urban population and lower initial urban poverty rate.

Figure 10. Changes in poverty due to food, fuel, and fertilizer shocks



Source: Simulation results from the survey-based microsimulation module within IFPRI's Uganda RIAPA model.

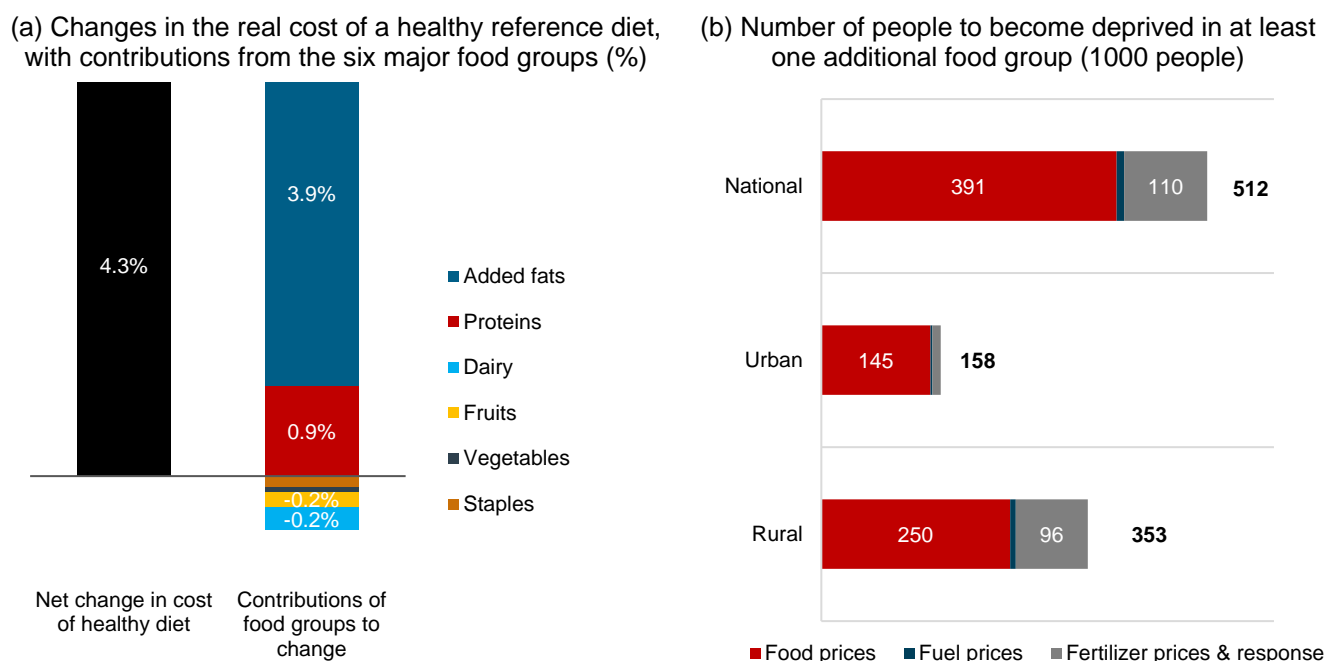
Note: Poverty headcount rate is the share of the population with daily adult equivalent consumption levels below the US\$1.90 poverty line.

The cost of a healthy diet increases for Ugandan households. The model tracks changes in the cost of a "healthy" reference diet (CoRD) with six major food groups as defined by the EAT-Lancet Commission.⁵ The combined food, fuel, and fertilizer shocks increase the CoRD by 4.3 percent in real terms (the first bar in Panel A in Figure 11).⁶ This is mainly driven by the rising cost of edible oils within the "added fats" food group, the domestic price of which is heavily influenced by rising world edible oil prices (the second bar in Panel A in Figure 11). However, falling household incomes reduce demand for fruits, dairy products, and staples (mainly cereals), and thus lower their costs slightly. The "staples" food group includes cereals and root crops, and wheat is only a small component of this group in Uganda. Rising maize and wheat prices are compensated for by the falling cost of other staple foods when households reduce overall food consumption. Staples currently dominate most household consumption baskets and achieving the diversity of the healthy reference diet requires a relative decline in the share of staples in the average household diet. As such, the increases in maize and wheat prices make a modest contribution to the changing cost of a healthy diet. On the other hand, consumption levels of fruits and dairy products are far below the required level for a healthy diet among many households in Uganda. The falling costs of these food groups mask the households' deteriorating access to these foods due to falling income.

⁵ For further information on the RIAPA model's diet module and indicators, see [Pauw et al. \(2021\)](#).

⁶ The CoRD is estimated using calorie targets from EAT-Lancet (for major food groups) and the World Bank's International Comparison of Prices (IPC) dataset. The estimated budget shares for the healthy diet include staples (10.6 percent), vegetables (9.9), fruits (14.5), dairy (21.9), proteins (31.4), and added fats (11.7).

Figure 11. Changes in diet costs and household diet deprivation due to food, fuel, and fertilizer shocks



Source: Simulation results from the survey-based microsimulation module within IFPRI's Uganda RIAPA model.

Diet quality worsens for many households. The survey-based micro-simulation tool also measures the increased number of people who experience a decline in diet quality. People are considered deprived in a food group if they obtain fewer calories from that food group than recommended by the healthy reference diet. Prior to the crisis, few households had the consumption levels and diversity needed for a healthy diet in Uganda. Rising food prices have a much more important impact on diet quality than impacts on household incomes or poverty. This shock, together with fertilizer shocks, causes 512,000 people to become deprived in at least one additional food group in Uganda. The rural population accounts for more of the deterioration in diet quality (Panel B in Figure 11).

5. Summary and Next Steps in the Analysis

Global food, fuel, and fertilizer prices have risen rapidly in recent months, raising concerns about how this will affect economic stability, food security, and poverty in developing countries. We have used IFPRI's economywide model—known as RIAPA—to simulate the impacts of the global crises on Uganda's economy and population. The model allows us to track the direct and indirect effects of rising world prices, taking account of key considerations that will determine the overall impact. These include, for example: the share of imports in total product supply; the importance of different sectors and products for households' employment, incomes, and consumption levels; and farmers' responses to rising fertilizer prices and the knock-on effect this could have on next season's agricultural production.

Our analysis indicates that Uganda's GDP and employment are not greatly affected by global price crises, mainly because Uganda exports maize and oilseeds and produces a small amount of crude oil and oil products. Most of the GDP losses are driven by rising fuel and fertilizer prices, rather than higher food prices. While export agriculture and its related services benefit, these gains are not

large enough to offset the fall in nonexportable agricultural production. Moreover, low fertilizer adoption for many large crops makes agriculture less at risk to fertilizer shocks. These two factors together limit the impact of the global crises on Uganda's agriculture sector.

However, poor households are still vulnerable to such global shocks. While real consumption falls similarly in percentage points among different household groups, such declines lead to rise in the poverty rate, particularly in rural areas. Finally, the real cost of a healthy diet increases significantly for Ugandan households, and there is a widening gap between households' consumption levels and what is required to achieve a healthy diet, caused mainly by higher food prices. While the global crises will have less impact on Uganda's overall economy, its adverse impacts on poverty and food insecurity are likely to be more pronounced, especially in rural areas.

This study is part of a series of case studies that IFPRI is undertaking using economywide models to capture current world market shocks on developing countries. The analysis presented above is an initial impact assessment designed to gauge the vulnerability of countries and key population groups. Subsequent analyses will simulate the mitigating effects of different policy and investment options, including the potential roles of cash transfers, food aid, and subsidies for food, fuel, and fertilizers. Particular attention will be paid to possible synergies and trade-offs between these policy responses, including their implications for government budgets and longer-term development goals.

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