

COUNTRY BRIEF 23

Poverty Impacts of Food Price Increases in Kenya

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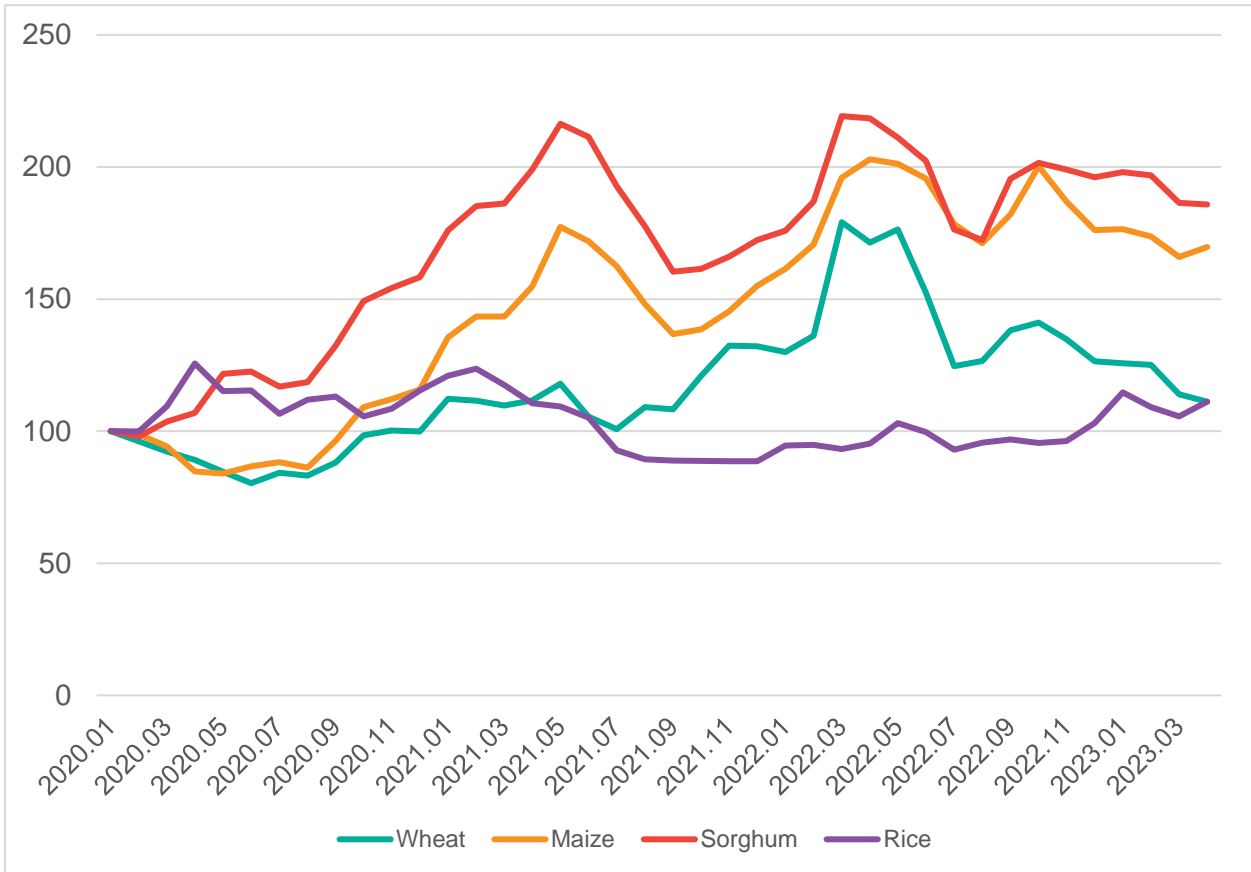
Agricultural commodity prices started to rise in mid-2020 partly due to supply chain bottlenecks associated with the outbreak of Covid-19. The invasion of Ukraine by Russia in February 2022 caused an additional spike in commodity prices, particularly those of wheat and maize. This brief estimates the impact of these price increases on poverty in Kenya. It is part of a series of six such briefs that estimate the poverty impact of higher world prices for staple grains. The other briefs cover Burkina Faso, Niger, Nigeria, Ethiopia, and Mali (see Martin and Minot, 2023a and 2023b; Minot and Martin, 2023a, 2023b, and 2023c).

The analysis starts by exploring the effect of the rise in international grain prices on the real price of selected grains in the domestic markets of the country. We estimate the impact of the changes in domestic grain prices on the real income of each household in a nationally representative survey, taking into account the importance of the commodities in consumption and as a source of income for each household. Finally, changes in the incidence of poverty are estimated based on the changes in real income for each household in the sample. We focus on the prices of maize, wheat, and sorghum for the reasons discussed below. The methods are described in more detail in a separate brief (see Minot and Martin, 2023d).

1. Trends in Kenyan grain prices

Kenya is potentially very vulnerable to sharp increases in the prices of key staple grains such as maize and wheat, both because these are important in diets and because Kenya depends on imports of these products. A first step in understanding the impacts of changes in the prices of these products is to examine developments in their prices on world markets. After a long period of relatively stable prices on world markets, the prices of key food staples began to rise from around the beginning of 2020. This period of price increases, spanning the COVID-19 pandemic and then the price shocks following Russia's invasion of Ukraine raised serious concerns about the welfare of poor people in countries such as Kenya. Figure 1 shows the movements in the prices of four key grain staples—maize, rice, sorghum and wheat—from the beginning of 2020.

Figure 1. World Grain Price Movements, 2020 to April 2023, Index=100 in January 2020



Sources: FAO GIEWS data accessed 3 May 2023. Wheat: US SRW wheat, Gulf Ports; Maize: US #2 Yellow, Gulf; Sorghum: US Export, Gulf; Rice: Thai 5% broken, Bangkok.

Figure 1 shows that the world prices of maize, sorghum and wheat began to rise at different points during the COVID-19 pandemic. By February 2022, the wheat price was up 36 percent from its level at the beginning of the pandemic while maize and sorghum prices had risen by 71 and 87 percent. These prices jumped immediately following the Russian invasion of Ukraine, with wheat up roughly 80 percent, maize up 100 percent and sorghum up 110 percent over January 2000 levels. Rice prices, by contrast, had not moved far from their initial level.

The surge in the prices of wheat and maize following the invasion of Ukraine reflected concerns that the supply of these grains to world markets from Ukraine and Russia—which together accounted for 25 percent of wheat exports and 15 percent of maize exports—would be sharply restricted. As it became clear that these exports would be much less restricted than originally anticipated, prices of these grains declined from their immediate post-invasion peaks. For the marketing year following the invasion (July 2022 to June 2023), total wheat exports from Russia and Ukraine increased by around 15 percent, with Russia’s exports rising by roughly one third and Ukraine’s declining by 8 percent¹.

While the higher world prices of recent years created incentives to increase supply and to reduce demand in many markets, these price increases were not passed through into many markets. This, in turn, forced world prices to go higher than otherwise to balance global supply and demand. For wheat, price insulation appears to have roughly doubled the increases in world prices during the COVID pandemic and between February and May 2022 (Martin and Minot 2022).

¹ Source: USDA PSD database, accessed 4 May 2023.

When assessing the impacts of world prices on the welfare of poor people, it is vitally important to consider the extent of price insulation. Clearly, when world prices rise and domestic prices are insulated against some or all of the price increase, any adverse impacts on vulnerable people are mitigated. But, against that, the collective impact of price insulation is to magnify the increase in world prices, increasing the impact of the original shock to world prices.

2. Impacts of Price Changes on Poverty in Kenya

A key influence on the importance of any staple food for poverty is its share in total calorie consumption, particularly given that the diets of the poor contain a larger share of starchy staples than those of better-off individuals. Foods that contribute only a trivial share of calorie consumption are unlikely to have a major impact on the welfare of poor people, even if their prices change dramatically. This share is shown in Table 1 for each of the key staples whose price rose sharply during the COVID and Ukraine crises. This Table reveals that the calorie share for maize is much higher than for wheat or sorghum in Kenya.

As shown by Deaton (1989) the importance of a staple food in the diet is not the only factor that determines the impact of a price change in a country where subsistence production is important. Rather, what matters is the difference between the share of the good in total income and its share in total expenditures—the so-called Net Benefit Ratio (NBR) for the food. Table 1 shows that the average share of household income from maize is much smaller than the share of expenditure for each staple food. The NBR as a percentage of initial income is larger in absolute value for maize (at 3.4 percent) than it is for wheat (2.5 percent) and for Sorghum (0.1 percent). These results show that average household real incomes are likely to fall by 0.34 percent for a 10 percent increase in the price of maize, by 0.25 and 0.01 percent for the same rise in the prices of wheat or sorghum.

Table 1. Importance of selected commodities in caloric intake, income, and expenditure

	Calorie share of diets (%)	Budget shares		
		Income share (%)	Expend-iture share (%)	Net benefit ratio (%)
Maize	26.7	3.8	7.2	-3.4
Wheat	13.3	0.0	2.5	-2.5
Sorghum	1.7	0.1	0.2	-0.1

Sources: Caloric contribution from FAO Food Balance Sheets, 2021 (FAO, 2023). Budget shares from the Povana database (Mamun and Laborde, 2021). Includes derived products such as flour and bread. Budget shares as a percentage of total expenditure.

What matters for household incomes in Kenya is not changes in world prices, but rather changes in domestic prices. Table 2 presents the changes in world and in domestic prices relative to January 2020 prices. Because inflation rates in Kenya were around 6 percent over much of this period, increases in nominal prices would tend to overstate the impact of price increases on the real economic welfare of Kenyan people. For this reason, the domestic price changes are presented in real as well as nominal terms, where real prices are adjusted for inflation using the Kenyan consumer price index.

Table 2 shows dramatic differences between the three prices reported for each commodity. For example, the 30 percent increase in world wheat prices prior to the Ukraine invasion is associated with only a one percent increase in real domestic prices. The further 46 percentage point increase in

world wheat prices to May 2022 has no apparent impact on domestic real prices, which rose only by six percentage points. The sharp decline in world wheat prices to July 2022 translated into a price decline of only one percentage point. The real domestic price for maize decreased by 14 percent during the COVID pandemic, in sharp contrast with the 61 percent increase in world prices during this period. The sharp rise in world prices following the Ukraine invasion was associated with a similarly sharp increase in domestic prices, while the decline in world prices to July 2022 was associated with a further increase in real domestic maize prices, leaving domestic real prices substantially higher than in January 2020. Finally, the real price of sorghum changed in line with world prices, although by smaller percentage changes throughout. We don't consider price changes after July 2022 since, as shown in Figure 1, the world prices for maize, sorghum and wheat remained in the same broad range well into 2023.

Table 2. International and domestic cereal prices in Kenya

Price index (100 = February 2020)					
Commodity	Price type	Pre-Covid (Feb 2020)	Pre-invasion (Jan 2022)	Peak (May 2022)	Post-peak (July 2022)
	World (US\$)	100	130	176	125
Wheat	Local nominal	100	114	126	126
	Local real	100	101	107	106
	World (US\$)	100	161	201	178
Maize	Local nominal	100	97	146	165
	Local real	100	86	124	139
	World (US\$)	100	205	229	190
Sorghum	Local nominal	100	102	188	169
	Local real	100	182	195	159

Source: All prices from FAO-GIEWS except IMF data for US Sorghum at Gulf used for its world price

The differences between movements in domestic and world prices are particularly striking. For maize, the government does not determine domestic prices, although it can influence them by announcing prices at which it will buy maize (USDA 2023). Most maize imports are sourced from regional partners, and especially Tanzania, which are subject to zero duties, but the nominal rate of protection (NRP) for maize has consistently been positive, averaging 21 percent over 2011 to 2020 (AgIncentives 2023). A quick comparison of prices in Kampala and those in Eldoret, Kenya over the period January 2020 to January 2023 using GIEWS data finds an average price about \$40 per tonne higher in Eldoret, with a correlation of 0.87. This suggests that the prices in these interior markets are strongly linked except for a margin that is likely related to transport costs, with both potentially somewhat isolated from movements in world prices.

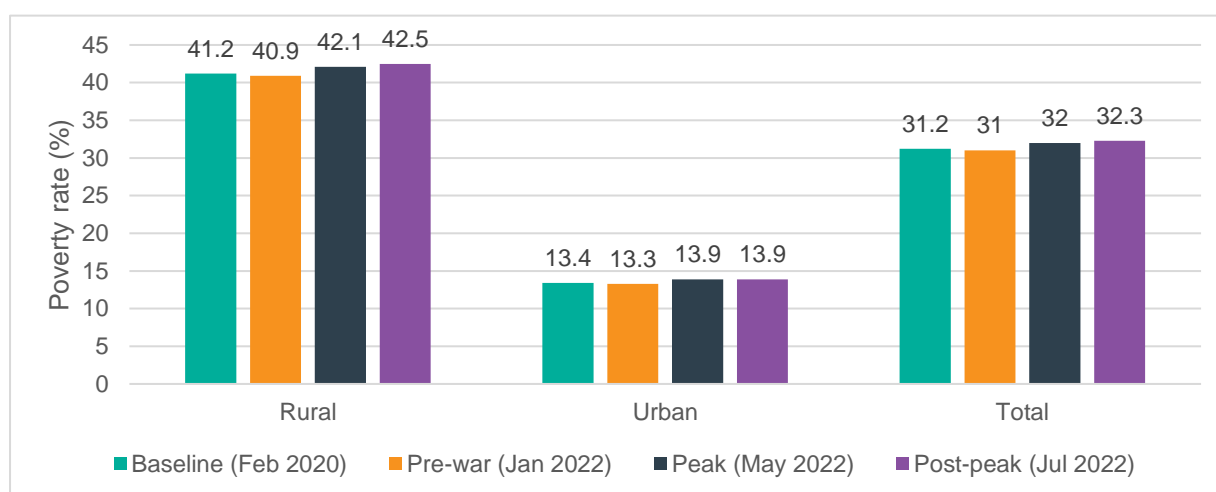
For wheat, Kenya was heavily dependent on imports over the period of interest—importing around 90 percent of total consumption. Surprisingly, protection to wheat appears to have been -17 percent in 2019, before the COVID era increases in world prices (AgIncentives 2023), despite a reported 10 percent tariff on wheat imports (USDA 2022). The sharp increases in world prices must have caused the protection rate to become more strongly negative in 2021 and 2022 as local prices declined relative to world prices.

3. Poverty Impacts of Grain Price Increases

Figure 2 compares poverty rates at baseline prices with those for the three key time periods considered in the analysis. The analysis uses the changes in domestic real prices of maize, sorghum and wheat over the periods considered in Table 2, combined with detailed information on income and expenditure patterns of each household in a nationally representative survey of Kenya. We are very conscious that the inflation rate of around six percent prevailing in Kenya over this period² will have generated some winners, such as those benefiting from higher commodity prices, and some losers, such as those dependent on fixed nominal wages or prices but measuring the extent of those impacts is both beyond the scope of our analysis and very challenging. By focusing on the real price impacts, we capture the welfare impacts of changes in the prices of grains relative to the prices of other goods.

Clearly, poverty rates are much higher and increase much more in percentage point terms in rural areas than in urban areas, with rural poverty rising from 41.2 percent in the pre-pandemic baseline to 42.5 percent in July 2022. Because the poverty rate is lower in urban areas, the share of people vulnerable to falling into poverty is smaller than in rural areas. Almost all the estimated rise in poverty is due to increases in the real price of maize, which both had the largest price increases and the greatest leverage on the poverty rate because of its relatively large adverse Net Benefit Ratio.

Figure 2. Impact of commodity price changes on poverty



Source: Authors' calculations based on changes in real prices of maize, wheat, and sorghum and household income and expenditure patterns.

4. Sensitivity Analyses

One key question about the results in Figure 2 is the extent to which the insulation of Kenya's domestic markets from the increases in world prices helped to reduce the impact on poverty. Another is whether the use of real price changes, rather than nominal price changes, would greatly affect the estimated poverty impacts. To address these questions, Figure 3 compares the estimated increases in national poverty (the left-hand bars) with those had world price changes applied (the middle bars) and those had the increases in domestic nominal prices been the only changes in domestic prices (the right hand bar in each set).

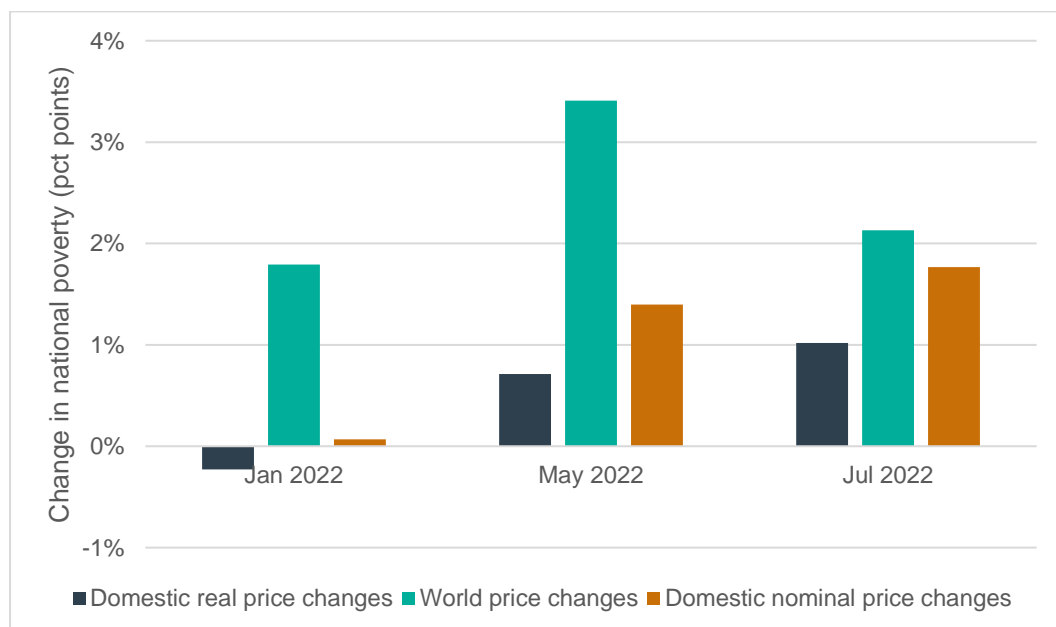
² Trading Economics. <https://tradingeconomics.com> Accessed 24 May 2023

The figure shows that the increases in poverty would have been dramatically different under the scenario of full price transmission relative to the assumption based on observed changes in domestic real prices. Had cereal prices risen in line with world price changes, poverty would have risen by over three percentage points at the peak of the Ukraine crisis in May of 2022 and over two percentage points after prices fell from that peak. Most of the increases in poverty are due to the rise in maize prices, with sorghum and wheat price rises playing a much smaller role. Even with the much more modest increases in domestic prices actually experienced, the rise in poverty of one percentage point is cause for concern.

The benefit to many vulnerable Kenyan households facing smaller increases in real food prices is clearly substantial in this case. But this should not automatically lead to endorsement of price insulation as a policy for developing countries more generally. Based on results by Martin and Minot (2022), around half the increase in world wheat prices following the Ukraine invasion came from countries insulating their markets against increases in world prices. While attractive to countries individually, it is collectively much less effective in reducing poverty impacts because it raises the world prices that are the source of concern to countries using this type of policy. Only those countries that insulate to a greater than average extent can expect to face smaller price increases than they would if all countries refrained from price insulation (Anderson, Martin and Ivanic 2017).

The final bars in the chart show that the increases in poverty would have been larger had the nominal price increases—rather than real price increases—been used as the basis for the calculations. The impact on the results was greater in the final period when prices of other goods have risen the most. In this case, the poverty increase based on the increase in nominal grain prices is 1.8 percentage points as against 1.0 percent when the real price changes are used.

Figure 3. Sensitivity Analysis to Different Food Price Increases



Notes: The first bar in each set is based on changes in real domestic prices; the second on the assumption that domestic prices moved in line with world prices and the third on use of nominal, as distinct from real, price changes.

5. Conclusions

The analysis presented in this brief highlights some important points. The first is that world prices of key staple foods such as maize, wheat and sorghum can be extremely volatile, with sharp but often

short-lived increases in prices having particularly dramatic impacts. With household survey data that are now widely available, it is possible to assess the short-run impacts of price changes on household incomes, and hence on poverty rates using simple, robust techniques.

In Kenya, as in many other developing countries, net purchases of staple grains by households tend to exceed net sales, sometimes by a substantial margin. This, and the importance of these foods as sources of calories contribute to a situation in which the short-run impact of higher prices on poverty can be substantial. However, it may be quite misleading to assume that domestic prices will move in line with world prices. In Kenya, real domestic maize prices declined by around 14 percent during the COVID pandemic, while world prices rose by over 60 percent. They then increased both during the world price spike following the invasion of Ukraine and the May-June 2022 period when world prices fell precipitously. Wheat prices rose much less than world prices during the Covid pandemic and the surge in prices. The price of sorghum rose substantially, although by less than the increase in world prices.

Kenya's insulation from the increases in world prices of recent years appears to have substantially reduced the large (over three percentage points) increase in poverty rates that would have occurred with full price transmission at the peak of the Ukraine crisis. It should be remembered, however, that a large part of the increase in world prices resulted from the widespread practice of price insulation worldwide.

This study is part of a series of case studies that IFPRI is undertaking to assess the impact of higher commodity prices on income and poverty in developing countries. The analysis presented is an initial impact assessment designed to estimate the impact of higher food prices on poverty in selected countries. The initial set of case studies covers Ethiopia, Kenya, Nigeria, Niger, Burkina Faso, and Mali. The analysis may be extended to cover other countries in the future.

ACKNOWLEDGMENTS

This study was conducted by IFPRI with financial support from the UK Foreign, Commonwealth, and Development Office (FCDO) and the US Agency for International Development (USAID). The authors are grateful for guidance and technical input from Rob Vos (IFPRI) and Donald Menzies (FCDO). For further information, please contact Nicholas Minot (n.minot@cgiar.org) or Will Martin (w.martin@cgiar.org).

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Funding for this work was provided by the UK Foreign, Commonwealth, and Development Office (FCDO) and the US Agency for International Development (USAID). The analysis makes use of the Povana database of household income and expenditure patterns. This publication has not been independently peer reviewed. Any opinions expressed here belong to the author(s) and are not necessarily representative of or endorsed by IFPRI.

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