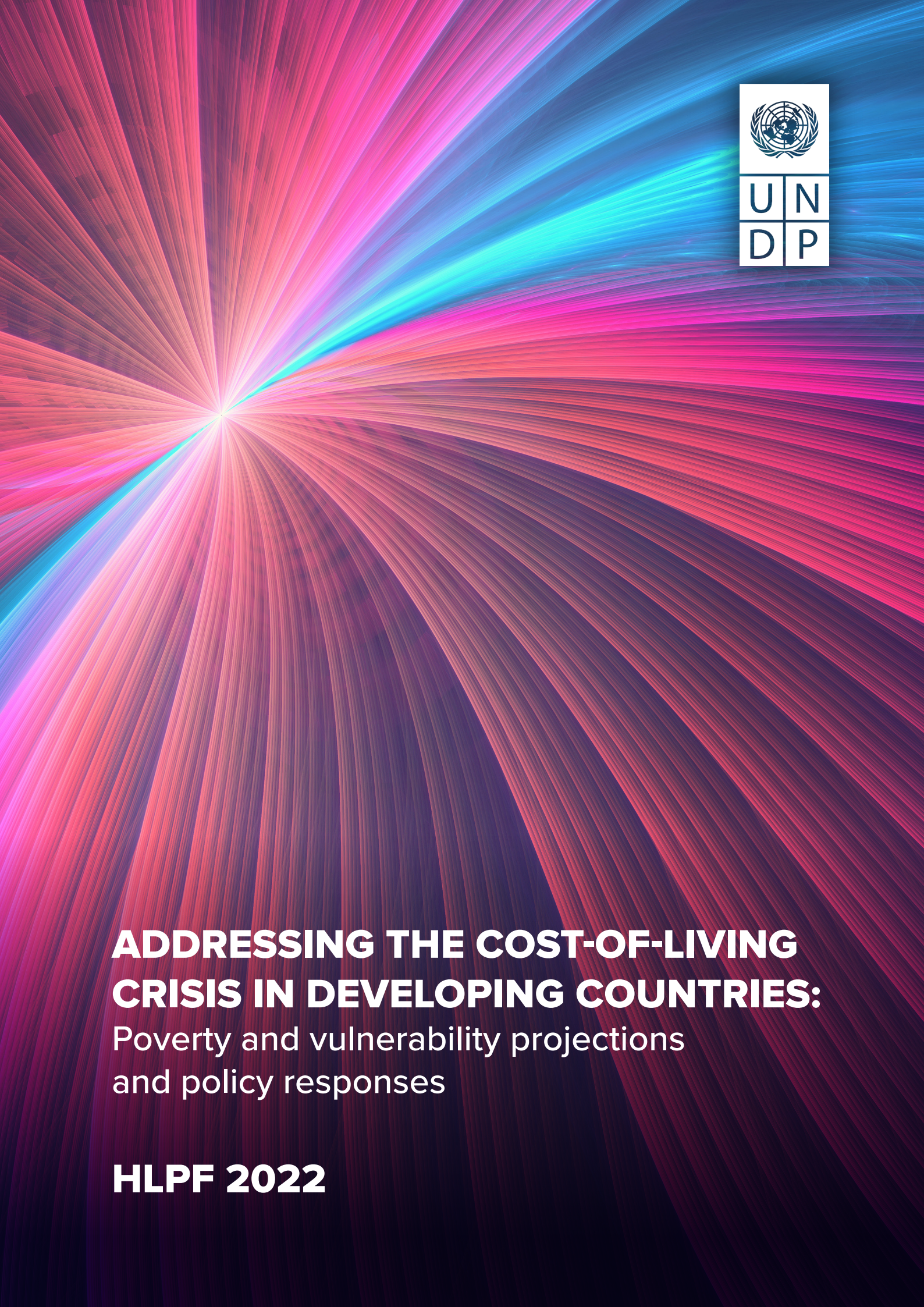

ADDRESSING THE COST-OF-LIVING CRISIS IN DEVELOPING COUNTRIES:

Poverty and vulnerability projections and policy responses

HLPF 2022

United Nations High-Level Political Forum on Sustainable Development (HLPF) 2022

Addressing the cost-of-living crisis in developing countries: Poverty and vulnerability projections and policy responses

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The ripple effects of the war in Ukraine have disrupted energy and food markets. Among many other factors, supply chain disruptions and price spikes in key commodities have been pushing the world towards a precarious inflationary surge. This will have immediate and devastating effects on household welfare—with those in poverty and near-poverty typically hit hardest due to their higher energy and food budget share— posing significant policy challenges to governments during the response. This paper estimates the potential effects of food and energy inflation on global poverty and vulnerability and simulates the welfare loss mitigation potential of two policy options: blanket energy subsidies and targeted cash transfers. The results suggest that soaring food and energy prices could push up to 71 million people into poverty, with clear hotspots in the Caspian Basin, the Balkans, and Sub-Saharan Africa (particularly in the Sahel). We find that targeted and time-bound cash transfers are the most effective policy tool to address the impacts.

Soaring food and energy prices

The war in Ukraine has severely disrupted global markets for food and energy due to both countries' large global market shares. Before the war, Russia was the world's largest and second biggest exporter of natural gas and crude oil, respectively, while Russia and Ukraine together accounted for almost a quarter of global wheat exports, 14 percent of corn exports, and more than half of sunflower oil exports (United Nations Comtrade Database).

A consequence of global market disruptions has been a further increase in energy and food prices—already on an upward trend after the first year of the pandemic and mainly driven by a recovering global demand with supply restrictions. More than two thirds of the 166.8 percent increase in natural gas over the twelve-month period ending on 31 May 2022 has been recorded since the start of the war on 24 February 2022. In the case of crude oil and its two main refined products, i.e., gasoline and heating oil, the post-invasion subperiod accounts for between half and 60 percent of the annual price increases and is also responsible for almost 40 percent of the annual price increase of wheat and for 60 to 75 percent of the annual price increases of corn and sunflower seed oil (Figure 1).[2]

Between half and two thirds of the 12-month international price increase in energy, sunflower seed oil and corn has occurred since Russia's invasion of Ukraine, whereas for wheat and some of the main fertilizers, the contribution of the post-invasion subperiod ranges from 30 to 40 percent.

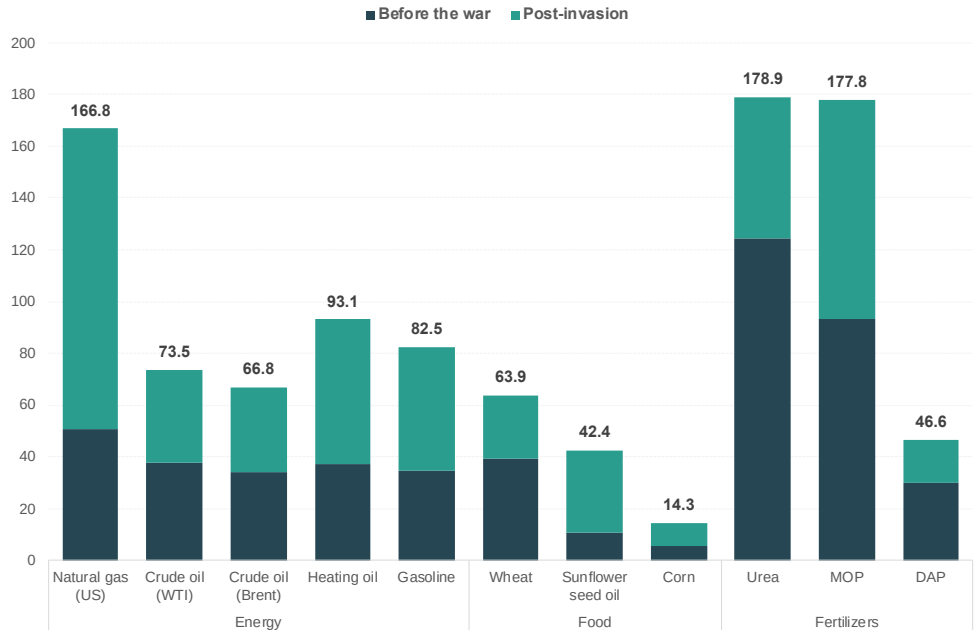

Figure 1: The chart plots the total percentage price increase of selected commodities over the 12-month period ending on 31 May 2022 (figures at the top of each bar) and its breakdown by subperiods before and after Russia's invasion of Ukraine on 24 February 2022.

Source: Authors' own elaboration based on daily energy and food prices from Trading Economics and on monthly prices for fertilizer from the World Bank Commodity Price Data (The Pink Sheet). *Notes*: MOP refers to muriate of potash (potassium chloride), and DAP refers to diammonium phosphate.

These price spikes have been sounding the alarm of a global inflationary surge not seen in years—partially because of feedback loop pressures (e.g., food production is highly energy-intensive) and soaring prices in other key commodities such as fertilizer (Figure 1), for which Russia is the world's biggest player, accounting for more than 15 percent of global exports (United Nations Comtrade Database). The International Monetary Fund (IMF 2022) has projected an inflation rate in 2022 of almost 6 percent in advanced economies, the highest in four decades, and close to 9 percent in developing countries and emerging economies, the highest since the Great Recession. For the 103 countries for which information is available up to February 2022 in the latest version of the Global Database of Inflation (Ha, Kose and Ohnsorge 2021), the median annual inflation rate had reached 7 percent.

This global context exerts negative direct and indirect effects on developing countries' economies and peoples. The global economy is expected to expand at a lower rate than previously forecast in the absence of the war—in 2022, 3.6 percent instead of 4.4 percent according to IMF (2022), or 2.9 percent instead of 4.1 percent according to World Bank (2022). In terms of people, the adverse effects tend to hit individuals' livelihoods in the short- and medium-term. Recent estimates suggest that the current context has contributed to the world still having at least 75 million more people in poverty than what was expected had the pandemic, war, and food inflation not occurred (Mahler et al. 2022). Finally, such

effects seriously threaten people's lives. The intersection of pre-existing inflationary pressures and war-induced disruption of production and distribution of food can exacerbate food insecurity and the risk of famines (UN 2022)—mostly driven by drought, an estimated 49 million people in 46 countries currently live in near-famine-like conditions, with 750,000 people at immediate risk of starvation, of whom about 75 percent are concentrated in Ethiopia and Yemen (FAO and WFP 2022).

The magnitude of these adverse effects, however, is not homogeneous and greatly depends on countries' exposure to shocks and coping capacity. Based on several indicators of direct and indirect economic exposure (e.g., trade, migration and financial and investment flows) and resilience (e.g., fiscal space, foreign reserves or debt), Raga and Pettinotti (2022) constructed an index of vulnerability to the economic effects of the war for 118 low- and middle-income countries that are home to about 80 percent of the world's population. As expected, the index reveals that some of the most vulnerable countries are located in Europe and Central Asia due to their bilateral exposure to both Russia and Ukraine, though a large number of countries with medium-to-high vulnerability are found in the Middle East and North Africa and in Sub-Saharan Africa—especially those that are commodity importers and those with a high dependency on tourism and remittance flows.

What were poor and vulnerable households' expected trajectories for 2022, had the war not occurred, and how has the war changed that counterfactual picture? The analysis below quantifies the potential short-term impacts that soaring food and energy prices recorded up to April 2022 could have had on poverty and vulnerability to poverty.

Poverty and vulnerability impacts of food and energy price spikes

Scenarios and assumptions

The analysis exploits binned distributions of per capita household income in 2019. These distributions are derived from the World Bank and cover about 95 percent of the world's population across 159 advanced and developing countries.[3] Changes in poverty and vulnerability-to-poverty headcount rates are computed from these distributions, projected forward to 2022, by following a counterfactual approach in the fashion of Mahler et al. (2020, 2022)—that is, by comparing the headcount rates resulting from household income had the war and its inflationary blow not occurred (benchmark scenario) with those calculated after accounting for the immediate income shock brought by the recent surge in food and energy prices (cost-of-living scenario).

Specifically, the *benchmark scenario* results from projecting the distributions from 2019 to 2022 using the growth rates between the observed value of countries' GDP per capita in 2019 and the corresponding value expected in 2022 in the absence of the war—as forecast in the IMF's World Economic Outlook Database (WEO) of October 2021.[4] These projections consider countries' demographic changes and follow the standard practice that only 85 percent of the growth rate in GDP per capita is passed through to households (Lakner et al. 2022). An important caveat is that, given the lack of more detailed information, the projected changes in per capita household income are distribution-neutral.[5]

The *cost-of-living scenario*, on the other hand, takes the previous projected distribution and translates the recent food and energy price spikes into direct reductions in household income, which occur in a proportional magnitude determined by household budget shares for food by quintile and budget shares for energy by percentile. The data on the former come from Mahler et al. (2022), whereas those

on energy shares by percentile are derived from the Household Impacts of Tariffs database (Artuc, Porto and Rijkers 2019) (see Appendix A). The food and energy inflation rates are derived from the inflation database of Ha, Kose and Ohnsorge (2021) and countries' official statistics for the period October 2021 (presumably the month from which actual inflation was not factored in the 2022 forecasts in the WEO October 2021) and April 2022 (the latest available) (see Appendix A). Over this six-month period, the food and energy inflation rates reached an average of 9.5 and 8.7 percent, respectively.

This cost-of-living scenario is likely an upper bound, indicative only of the potential *immediate* shock on household income from soaring prices. At least two caveats are worth mentioning. First, this scenario assumes full pass-through of prices to households and that all households are net buyers of food and energy. Yet, a noticeable share of households, at least in the case of food items, are net sellers and would benefit from higher prices (see, e.g., Artuc et al. 2022). Second, the scenario omits changes in household behaviour and substitution effects as a response to price spikes, as well as new policy responses in the form of increased blanket subsidies, tax cuts or cash and in-kind transfers.[6] In sum, whether the short-term poverty increases documented below persist over time will depend on how protracted the food and energy inflationary pressures are, on households' coping and adaptation strategies and on the capacity of governments to implement and sustain mitigation policies.

Changes in poverty and vulnerability-to-poverty

Using the distributions of per capita household income for both benchmark and cost-of-living scenarios, poverty headcount rates are quantified through typical international standards (per person, 2011 PPP): $1.90 a day, the World Bank's standard of absolute poverty, and $3.20 and $5.50 a day, equivalent to the median values of the poverty lines among, respectively, lower-middle- and upper-middle-income countries (Jolliffe and Prydz 2016). For the measurement of vulnerability to poverty, the analysis uses a threshold of $13 a day, which is associated with a low probability of falling into poverty at $5.50 a day (see, e.g., Bussolo et al. 2018; Lopez-Calva and Ortiz-Juarez 2014).

Figures 2 and 3 (panel a) summarize our results. Compared to the benchmark, the poverty headcount based on the $1.90-a-day poverty line increases by 51.6 million people after accounting for the food and energy inflationary pressures—from almost 624 million people to 675.5 million people, or from 8.3 percent to 9 percent of the world's population. The additional number of people falling into poverty at $3.20 a day reaches up to 20 million, leaving the net cumulative figure at 71.5 million people and the headcount rate at 22.7 percent—almost one percentage point higher than in the benchmark. Notice that, globally, the number of those living on either $3.20 to $5.50 or $5.50 to $13 a day (i.e., those who are non-poor but vulnerable to falling into poverty) decreases slightly as more individuals are pushed below $3.20 or $1.90 a day. The total population in poverty or vulnerability to poverty adds up to a global figure of 5,164.1 million people (68.6 percent) under the cost-of-living scenario, i.e., 67 million people more than in the benchmark. Finally, the cost-of-living crisis could exacerbate the intensity of poverty —defined as the per capita shortfall in income as a percentage of the corresponding monetary threshold. Panel b of Figure 3 shows that, compared to the benchmark, the poverty gap could increase by 11.2 percent for the $1.90-a-day poverty line (from 0.028 to 0.031) and by 7 percent for the $3.20-a-day poverty line (from 0.077 to 0.082). This indicates that soaring food and energy prices has worsened the conditions of the existing poor population.

The increase in poverty at $1.90 a day could push the global headcount rate upwards from 8.3 percent to 9 percent after the impact of soaring food and energy prices—at higher poverty lines, the global headcount could increase by about one percentage point.

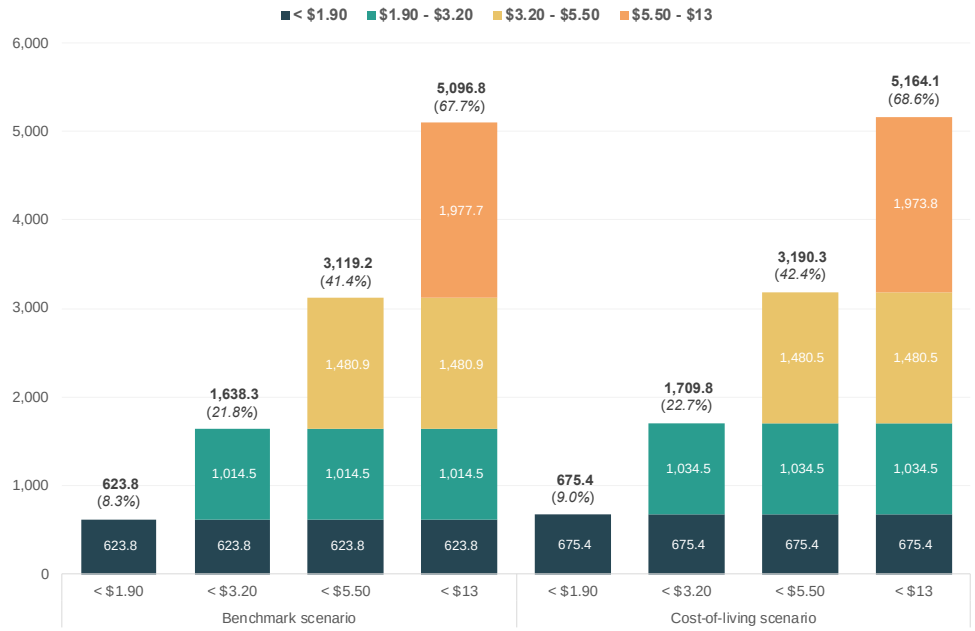

Figure 2: The chart plots projections of the number of people living in poverty and vulnerability to poverty under different monetary thresholds for both benchmark and cost-of-living scenarios (million people and percentages of the global population atop each bar). The figures within each bar's portions correspond to the population living either under $1.90 a day or within the indicated intervals above $1.90.

Source: Authors' own elaboration based on the sources described in the text.

The projected number of people falling into poverty at $1.90 a day reaches 51.6 million after the short-term impact of soaring food and energy prices, and up to 71 million people if poverty is measured with higher poverty lines. The cost-of-living crisis could also worsen the conditions of the existing poor population.

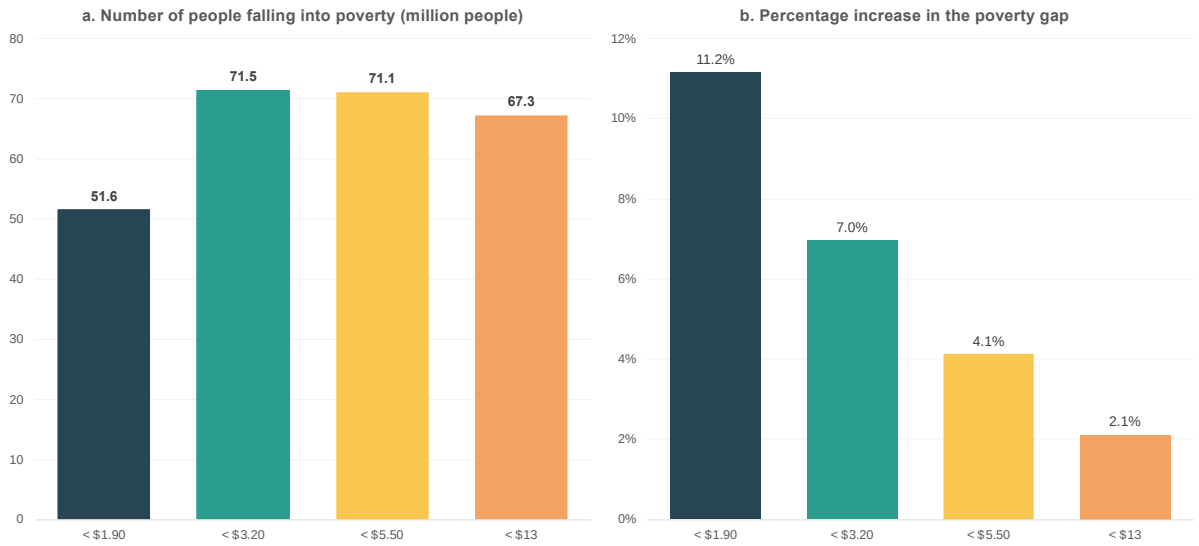

Figure 3: Panel a plots the number of people who could fall below different monetary thresholds as a result of soaring food and energy prices vis-à-vis the benchmark scenario (million people). Panel b plots the percentage increase in the poverty gaps estimated in the cost-of-living scenario vis-à-vis those estimated in the benchmark scenario.

Source: Authors' own elaboration based on the sources described in the text. *Notes*: The poverty gap is defined as the average shortfall in per capita income as a proportion of the corresponding monetary threshold. The gaps estimated for the $1.90, $3.20, $5.50, and $13-a-day thresholds are, respectively: 0.028, 0.077, 0.181, and 0.405 in the benchmark scenario, and 0.031, 0.082, 0.188, and 0.414 in the cost-of-living scenario.

Which countries are exposed to the largest global poverty impact? For each poverty line, the distribution of the proportional increases in poverty across countries, vis-à-vis the benchmark scenario, is broken down into categories of low, medium, and high poverty impact and plotted as a heatmap in Figure 6. Among those countries likely facing high poverty impacts across *all* poverty lines are Armenia and Uzbekistan in the Caspian Basin; Burkina Faso, Ghana, Kenya, Rwanda and Sudan in Sub-Saharan Africa; Haiti in Latin America; and Pakistan and Sri Lanka in South Asia. In these countries, around 3 percent of the population, on average, could fall into poverty. In Ethiopia, Mali, Nigeria, Sierra Leone, Tanzania and Yemen, the impacts could be particularly hard at the lowest poverty lines, whereas in Albania, Kyrgyz Republic, Moldova, Mongolia, Tajikistan and Ukraine, the hits could be hardest at $5.50 a day.[7] Clear geographical hotspots, depending on the poverty line, emerge in Sub-Saharan Africa, mainly in the Sahel region, the Balkans and the Caspian Basin (see Appendix B).

The group of countries facing the largest poverty impacts at $1.90 or $3.20 a day tends to be concentrated in Sub-Saharan Africa, particularly in the Sahel, whereas at $5.50 a day the concentration occurs in the Caspian Basin and the Balkans.

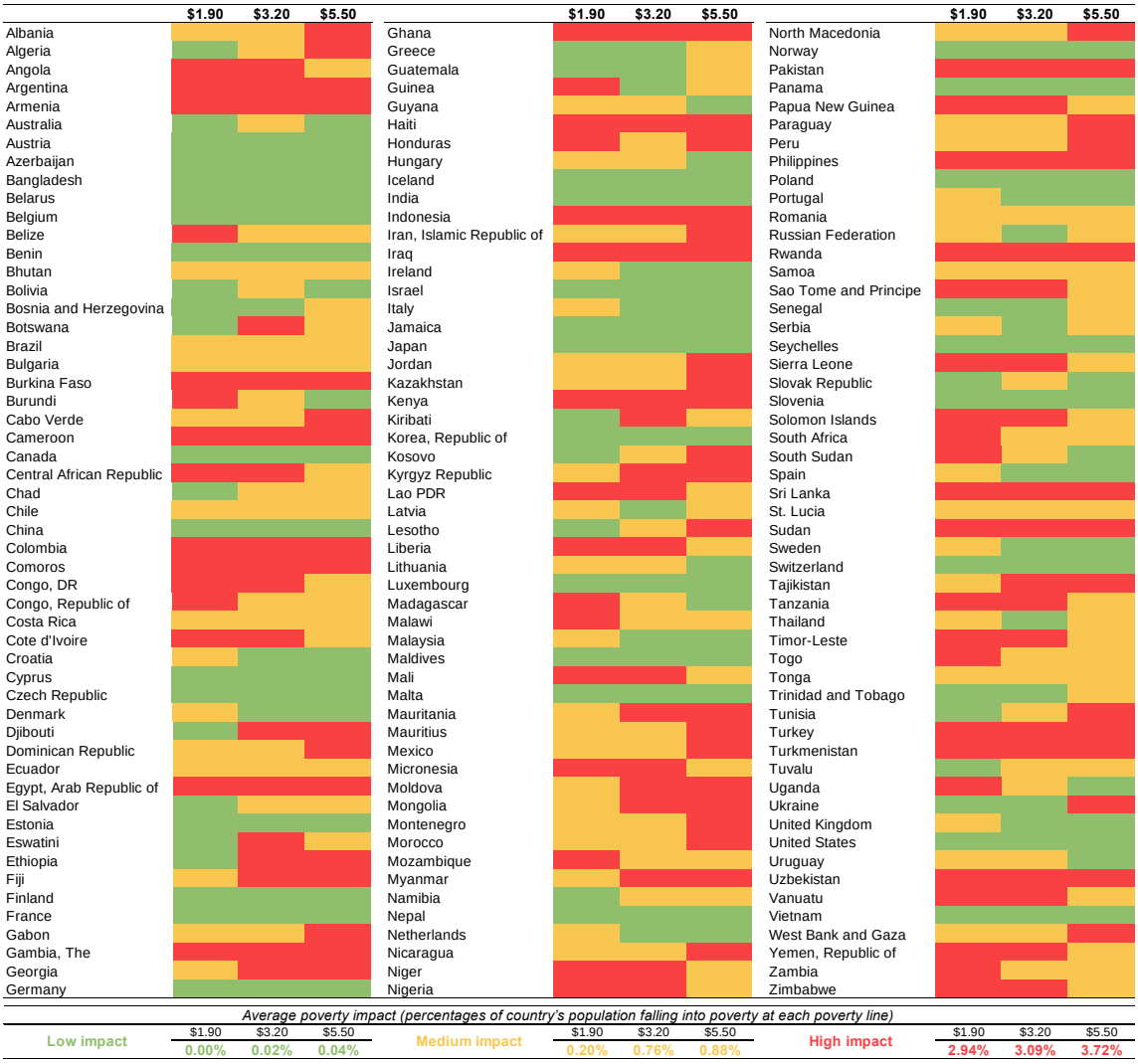

Figure 4: The figure plots countries' poverty impacts under different monetary thresholds. The poverty impact is measured as the proportion of each country's population falling into poverty as a result of soaring food and energy