

COUNTRY BRIEF

# The global food and economic crisis' impact on food system resilience: Pakistan



November, 2023

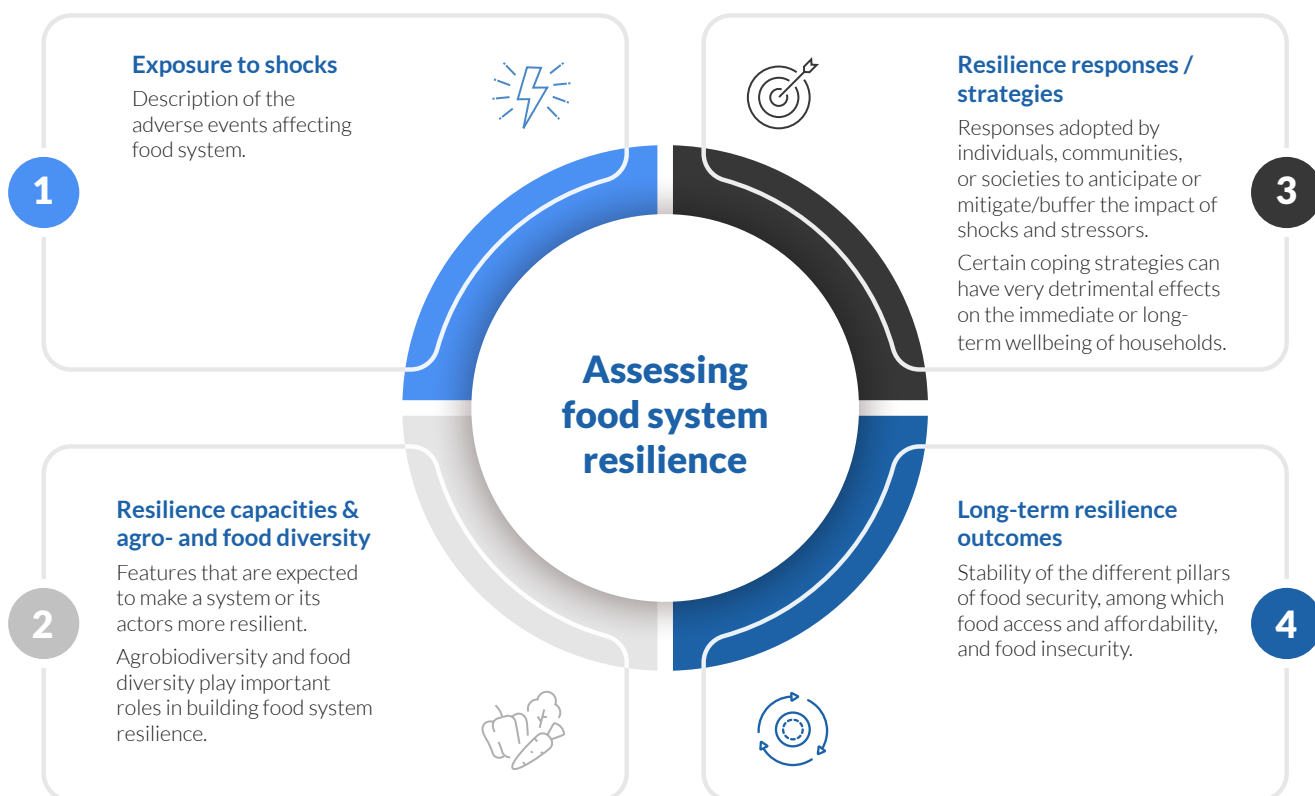
## Background

The war in Ukraine has major implications for food security and diets across the world, given both countries' key roles in global food markets and Russia's prominence in global energy trade. The resulting global food and economic crisis risks heightening inequalities and vulnerabilities in a world still confronting the effects of the COVID-19 pandemic. In this context, food system resilience is crucial to maintain or adapt its functions in the face of shocks, and ultimately for system sustainability. Through a series of key indicators, this brief describes how the food system has been affected by this ongoing crisis and provides an overview of its resilience and potential opportunities for building resilience further.

## Assessing food system resilience

Food system resilience is defined as “the ability of different individual and institutional food system actors to maintain, protect, or quickly recover the key functions of that system despite the impacts of disturbances”<sup>1</sup>. Drawing from the conceptual framework established by the Food Systems Countdown Initiative<sup>2</sup>, food system

resilience was measured through 4 main indicator domains. Findings presented in this section were derived from national level data, and would therefore not enable the detection of likely food system subnational variabilities.



<sup>1</sup> Fanzo J, Haddad L, Schneider KR, Béné C, Covic NM, Guarín A, et al. Viewpoint: Rigorous monitoring is necessary to guide food system transformation in the countdown to the 2030 global goals. *Food Policy*. 2021;104

<sup>2</sup> <https://www.foodcountdown.org/about>

## HOW HAS PAKISTAN BEEN EXPOSED TO SHOCKS SINCE 2020?

In the last 3 years, Pakistan has faced shocks that have affected the food system and its resilience in various ways. Like the rest of the world, Pakistan was hit by the COVID-19 pandemic in March 2020. To minimize COVID-19 spread, the government rapidly implemented strict containment strategies such as restrictions of movements and public gatherings among others, which can impact various domains of the food system (e.g., supply chain, consumer environment, consumer behaviors). Following the same timeline, the country also adopted supportive economic policies as part of their COVID-19 relief package, such as income support for the population (e.g., cash assistance to daily wage workers and low-income families) (Figure 1).

The Pakistani currency (Pakistani Rupee, PKR) exchange rate – relative to the US dollar (USD) – has been relatively stable from 2013 to 2017 (between 102 and 106 PKR per USD) but underwent a depreciation in 2018-19 (from 106 in 2017 to 150 PKR per USD in 2019). During the crisis period, the PKR depreciation persisted in 2020, levelled off in 2021, and then increase sharply by 26% in 2022 to reach 205 PKR per USD, the highest level observed within the reporting period (Figure 2). The weakening of PKR in 2022 may have been a result from the devastating floods the country experienced that year, domestic political challenges, and the volatility in global financial markets resulting from the war in Ukraine.

Besides shocks related to the COVID-19 pandemic and the war in Ukraine, Pakistan is also prone to numerous natural hazards, such as floods, landslides, earthquakes, and droughts. This is illustrated by the major floods that occurred in 2010 and 2022, which primarily contributed to the 10% and 14% of the Pakistani population that were affected by natural disasters these years (Figure 3). Due to a combination of political, geographic, and social factors, Pakistan is recognized as particularly vulnerable to climate change impacts and ranked 150th out of 185 countries in the 2021 ND-GAIN Index<sup>3</sup>. As mentioned in a 2018 report, weather patterns get more erratic and frequency and/or intensity of extreme events are rising with climate change, potentially exacerbating vulnerabilities and impact on people food security, especially poor rural households which depend on small-scale, rainfed agriculture<sup>4</sup>.



<sup>3</sup> The ND-GAIN Country Index summarizes a country's vulnerability to climate change and other global challenges in combination with its readiness to improve resilience. <https://gain.nd.edu/>

<sup>4</sup> Sustainable Development Policy Institute, Pakistani Ministry of Climate Change & World Food Programme. (2018). *Climate Risks and Food Security Analysis (CRFSA): A Special Report for Pakistan*

Figure 1: COVID-19 - government response 2020-2022

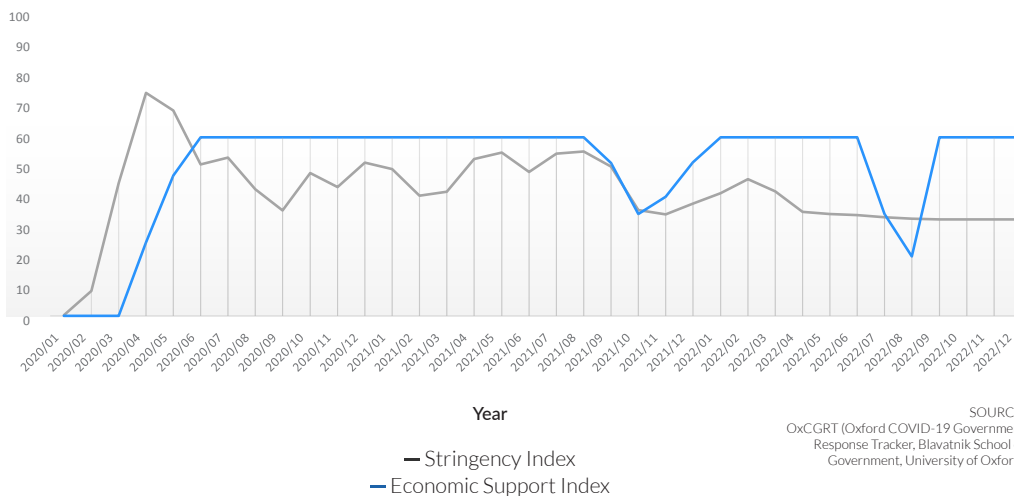


Figure 2: Exchange rate 2010-2022

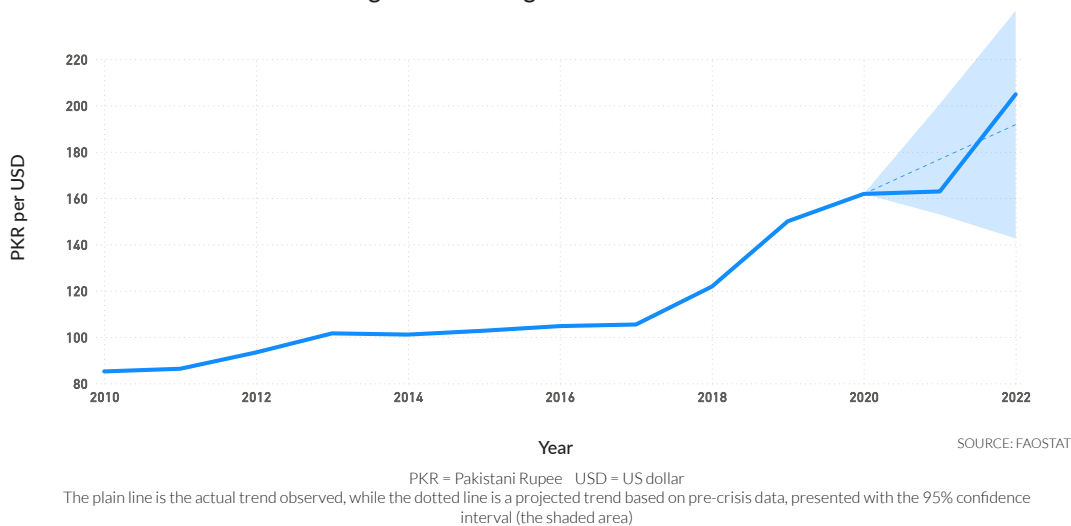
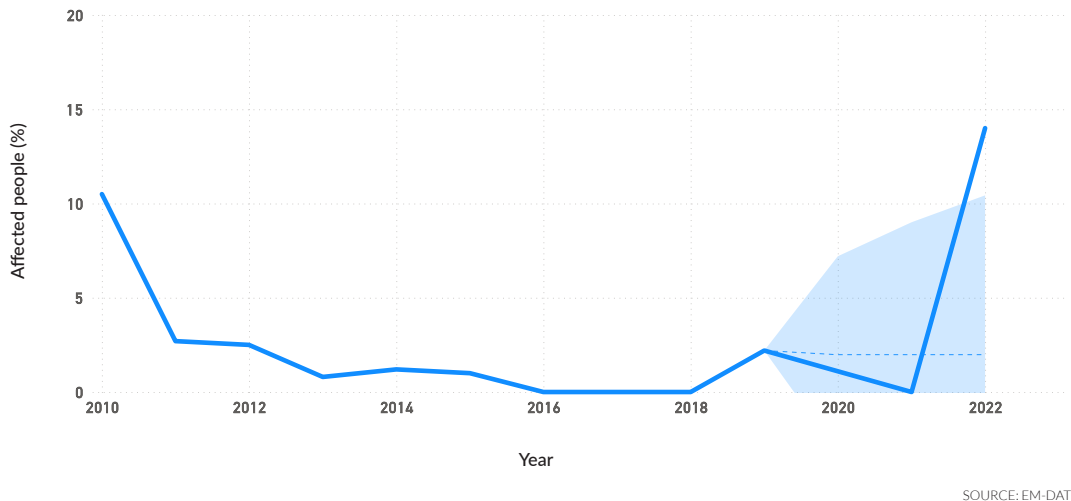


Figure 3: Ratio of affected people (from natural disasters) to the total population 2010-2022



## HOW HAVE RESILIENCE CAPACITIES AND AGRO- AND FOOD-DIVERSITY BEEN AFFECTED?

According to country-level statistics, food system resilience capacities seem to have stood up reasonably well to the successive shocks (Table 1).

With respect to domestic production, after a marked decline in 2018, the trend in crop production has been steadily increasing from 2019 to 2021 (from 96 to 117; 2014-2016=base 100). Livestock production also seems not to have been affected by the crisis, as the observed trend in 2020-21 has been similar to the pre-crisis period and continued to increase, to reach 127 in 2021 (2014-2016=base 100) (Figure 4). However, the rising trend in crop production shown in our data may not indicate that, in 2022, wheat production was reported to be lower than what the Pakistan government had expected, with signs of improvement in 2023, although it still fell below Pakistan's essential requirements.

With regards to food imports, overall volumes of NCD<sup>5</sup>-protect and NCD-risk food groups imported have been relatively low (between 11.8-20.6, and 0.2-13.1 Kg per capital for NCD-protect and NCD-risk food respectively). The trends for both NCD-protect and NCD-risk food groups have been stable with minimal variations throughout the pre-crisis period. During the

crisis period, volumes of NCD-risk food imported marginally increased but remained extremely low (3.2 Kg per capita in 2021) while volumes of NCD-protect food rose a little more markedly (from 15.2 to 20.6 Kg per capita) – mainly due to legumes and other vegetables. Volumes of other food imports were stable from 2010 to 2015, sharply declined up to 2018 (to reach almost 0 Kg per capita) and then markedly rebounded in 2019 to stabilize the 2 next years (Figures 5, 6).

Mobile cellular subscriptions – a proxy of country's infrastructure level and therefore an important indicator for resilience – continued to rise in 2020 and 2021, following the same trend as pre-crisis, and stagnated in 2022.

While social capital index – which reflects the strength of personal and social relationships, institutional trust, social norms, and civic participation in a country – progressed between 2016 and 2020 (from 42 to 51), it slightly declined (by 4 points) the following two years. A moderate increase was observed in 2022.



<sup>5</sup> NCD: non-communicable diseases

**Table 1: Evolution of indicators of 'resilience capacities and agro- and food-diversity' domain from pre-crisis to crisis period, Pakistan**

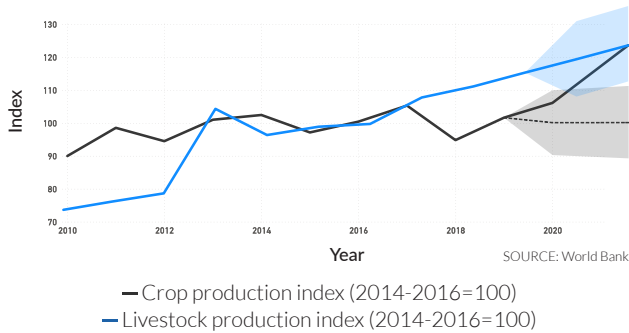
Resilience sub-domain	Indicator	Unit	Data period covered	Desirable direction	Actual direction during crisis*	Trend analysis
Food produced domestically	Crop production index (2014-2016=100)	Index	2010-2021	↑	↑	Overall, slight upward trend pre-crisis but decline in 2018. Rebound in 2019 and steep increase during crisis period.
	Livestock production index (2014-2016=100)	Index	2010-2021	↑	↑	Steady growth since 2014, no change in trend during crisis period.
	Fertilizer consumption	Kg/ha of arable land	2010-2020	→ or ↑	→	Upward trend from 2013 to 2017, stagnation until 2019, and slight increase in 2020.
Imported food	Food import – NCD-protect	Kg/capita	2010-2021	↑	↗	Stable trend from 2015 to 2019, slight increase in 2020-21.
	Food import – NCD-risk	Kg/capita	2010-2021	↓	→	Stable trend pre-crisis, marginal increase during crisis period
Infrastructure	Mobile cellular subscription	Number / 100 people	2010-2022	↑	↗	Steady increasing trend pre-crisis (except 2015), continued during crisis period. Stagnation in 2022.
Social capital	Social capital index	Index	2010-2023	↑	↘	Slight increasing trend from 2016 to 2020, small decline in 2021-22 and light progress in 2023.

\* Average crisis period compared to pre-crisis average (2018-2019 depending on data availability)

Desirable direction: ↑ denotes a higher value is more desirable, ↓ denotes a lower value is more desirable. Actual direction: a blue arrow denotes no substantial changes and stable value, a green arrow (up/down) denotes a direction similar to the desirable one, a light green arrow (diagonal up/down) denotes a direction similar to the desirable one but less pronounced, a red arrow (up/down) denotes an opposite direction to the desirable one, an orange arrow (diagonal up/down) denotes an opposite direction to the desirable one but less pronounced

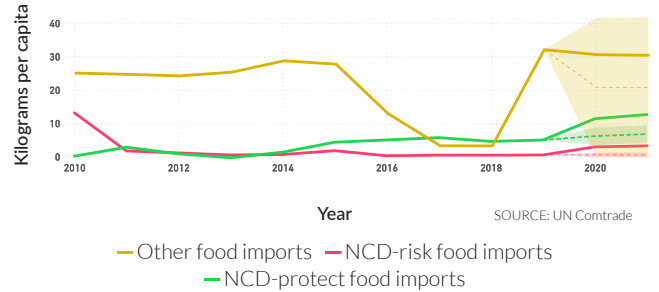
Kg= kilograms; ha= hectare

**Figure 4: Domestic production indices 2010-2021 (2014-2016=100)**



The plain line is the actual trend observed, while the dotted line is a projected trend based on pre-crisis data, presented with the 95% confidence interval (the shaded area)

**Figure 5: Country-level food imports 2010-2021**



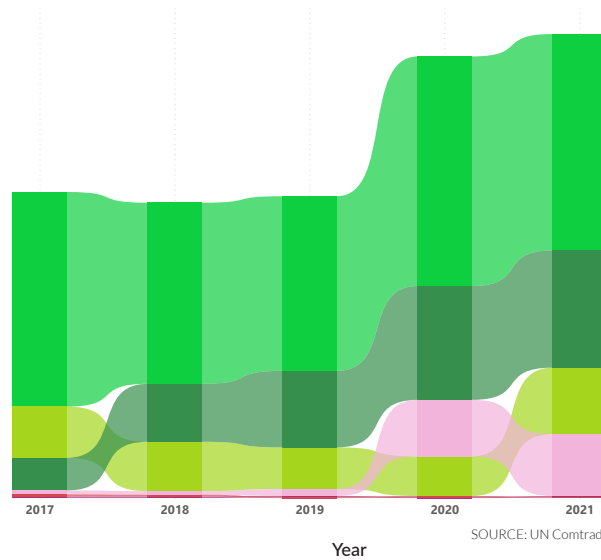
NCD: non-communicable disease  
 The plain line is the actual trend observed, while the dotted line is a projected trend based on pre-crisis data, presented with the 95% confidence interval (the shaded area)  
 Note: outliers for NCD-risk 2012 and NCD-protect 2016 were excluded from analysis.

**Figure 6: Country-level food imports 2017-2021 (volume per capita), top 3 NCD-protect and NCD-risk food groups**

- Legumes
- Other fruits
- Other vegetables
- Other sweets
- Packaged ultra-processed salty snacks
- Sugar-sweetened beverages (soft drinks)

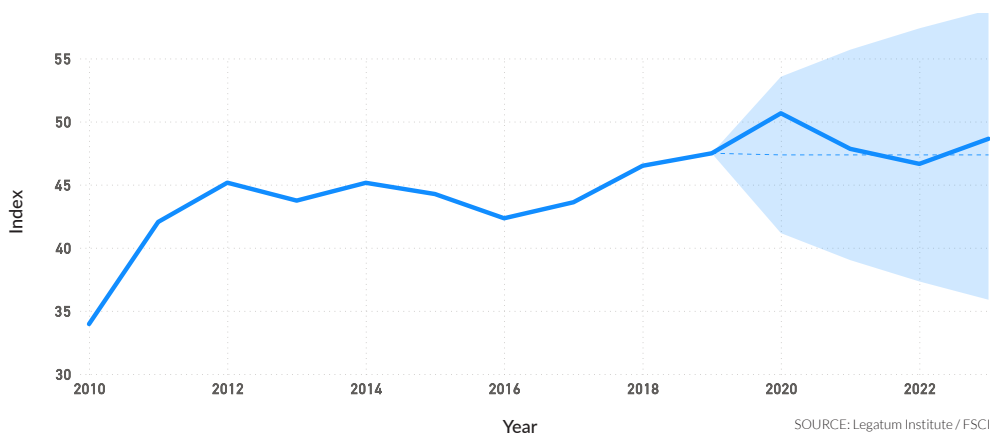
NCD: non-communicable disease

This indicators shows the total volume of imports (kilograms or liters, depending on type of food) by year for the top 3 NCD-protect and NCD-risk food groups. The top 3 food groups are defined as the food groups with the highest volumes imported for a given year. The NCD-protect food groups are displayed with a range of green color and the NCD-risk food groups with a range of red colors.



SOURCE: UN Comtrade

**Figure 7: Social capital index 2010-2023**



SOURCE: Legatum Institute / FSCI

The plain line is the actual trend observed, while the dotted line is a projected trend based on pre-crisis data, presented with the 95% confidence interval (the shaded area)

## RESILIENCE RESPONSES / STRATEGIES AND LONGER-TERM RESILIENCE OUTCOMES

Based on the analysis of national level data, while the resilience capacities seem to have endured the current crisis relatively robustly, the same cannot be said about food system resilience outcomes. On the contrary, the crisis period was characterized by a deterioration in several resilience outcomes indicators (Table 2).

With respect to resilience responses, surprisingly there was a shift in trends regarding livelihood coping strategies at the start of the crisis (2020), compared to 2019: the use of drastic coping mechanisms strongly declined (from 26% to 10% (crisis) and 35% to 12% (emergency)) whereas the adoption of stress coping strategies or not at all substantially increased (from 17% to 29% (stress) and 22% to 50% (none)). However, the two next years (2021; 2022) were marked by a slight decline of the use of stress and emergency mechanisms, a sharp fall in those not using any coping strategies (-26%), and a high rise of the use of crisis strategies (+33%) (Figure 8). Similarly, when looking at the reduced coping strategy index (rCSI) the proportion of households in the “medium coping” and “high coping” categories decreased while those in the “low coping” category sharply increased in 2020 compared to 2019 (Figure 9). In 2021-22, the trends reversed and those in “low coping” halved and went back to 2019 level, those in “medium coping” almost doubled to reach 56% (10 points higher than 2019), while those in “emergency coping” category slightly increased but remained below the 2019 level. This demonstrates an erosion of households’ capacity to cope and withstand shocks. However, these results – particularly those related to 2020 – must be interpreted with caution, as data were collected only for rural populations from different provinces across years (only Khyber-Pakhtunkhwa province was included in 2020 whereas Sindh and Balochistan provinces were included for the other years).

The surprising trend in LCS could be attributed to the nature of the data source, which involves real-time monitoring. Given that most of Pakistan’s population resides near the poverty line, when people receive assistance during emergencies, those on the borderline can potentially shift to a more stable position. After the 2022 floods, WFP, the Pakistani Government and other humanitarian actors, provided cash transfers to 3.4 million people for food purchases, which likely reduced the reliance on negative coping strategies among households in the short term. However, in the long term, a reduction in negative coping strategies occurs when people enhance or diversify their sources of livelihood and when communities become more resilient. As a result, it’s possible that the data may have primarily captured the short-term impact on LCS, while long-term effects might take more time to manifest.

Before the crisis, Pakistan experienced a consistent decline in food price inflation, with the rate decreasing from 16.9% in 2010 to 2.2% in 2018. However, inflation increased to 10.6% in 2019, and this marked upward trend continued in 2020 (15.5%) before falling back in 2021 – but still remaining high, at the 2019 level. In 2022, the food price inflation soared to reach its highest level (24.7%) within the period considered (Figure 10). Specifically,

food inflation in December 2022 increased by 35.50% compared to December 2021. The peak occurred in May 2023 at 48.65%<sup>8</sup>. One contributing factor may be the strong depreciation of the Pakistani currency observed during the same period (Figure 2). Nevertheless, the annual data might not capture monthly variations and the possibility of even higher food price inflation that the country may have experienced after the floods in July 2022. The volatility in food prices is also reflected in the food price anomalies (IFPA) for wheat. While price growth for wheat has been normal pre-crisis, it sustained a substantial increase in 2020 (IFPA=1), returned to normal in 2021, but underwent another moderate growth in 2022 (IFPA=0.6 – Figure 11). The abnormally high wheat prices observed this year may result from the dramatic drop in grain exports following the war in Ukraine, as both countries are the leading wheat exporter for Pakistan. However, the impact of government policies, specifically subsidies and pricing strategies, might also influence wheat prices.

With respect to food supply variability, which is an indicator of food availability, the pre-crisis period has seen a steady deterioration between 2013 and 2018 with food supply variability going up (from 9 to 26 kcal/capita/day), while it dropped to 15 kcal/capita/day in 2019. Food supply variability rose again to reach 23 kcal/capita/day in 2020 and stabilized in 2021 (Figure 12).

The weakened food system resilience, as evidenced by a surge in food price and a decline in food availability, may have adversely impacted the purchasing power and to access food for the Pakistani population. Even before the crisis, a significant proportion of the population could not afford a healthy diet, and this problem worsened in 2020, reaching its peak at 83.5% during the reporting period. It marginally declined in 2021 (Figure 13). In addition, prevalence of moderate or severe food insecurity has been dramatically progressing since 2018, going from 14.2% to 42.3% in 2021 (Figure 14). However, lack of data for the subsequent years does not enable to assess further the effect of the on-going crisis and resulting food system challenges on the Pakistani population’s food security.

<sup>8</sup> World Food Programme. Pakistan Market Monitor Report. WFP VAM – Food Security Analysis. June 2023.



**Table 2: Evolution of indicators of 'resilience responses / strategies' and 'longer-term resilience outcomes' domains from pre-crisis to crisis period, Pakistan**

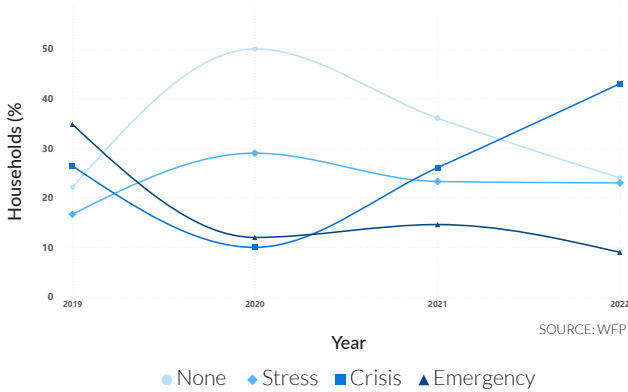
Resilience sub-domain	Indicator	Unit	Data period covered	Desirable direction	Actual direction during crisis*	Trend analysis
Coping strategies	Livelihood coping strategy (LCS): - None (N) - Stress (S) - Crisis (C) - Emergency (E)	% population	2019-2022	↑ N  ↓ S, C, E	→ N ↗ S ↑ C ↘ E	In 2020, marked decrease of the use of crisis and emergency strategies while opposite trend for the use of stress strategies or not using any strategies ("none"). In 2021 and 2022, sharp decline of "none" while strong increase of crisis strategies. Less variations in the use of stress and emergency strategies.
	Reduced Coping Strategy Index (rCSI): - Low (L) - Medium (M) - High (H)	Index	2018-2021	↑ L  ↓ M, H	→ N ↑ M ↘ H	In 2020, decline of medium and high rCSI while strong increase in low rCSI. In 2021-2022, decline of low rCSI while marked increase in medium rCSI and slight rise in high rCSI.
Food price volatility	Food price annual inflation	%	2010-2022	↓	↑	General downward trend until 2018, then marked rise in 2019-20. Decline in 2021 while strong rise in 2022.
	Food Price Anomalies (IFPA), wheat	Index	2015-2022	↓	↑	Normal price growth pre-crisis. High price growth in 2020, return to normal in 2021, but moderately high growth in 2022.
Food supply variability	Food supply variability	Kcal / capita / day	2010-2021	↑	↗	Steady increase from 2013 up to 2018. Sharp decline in 2019. During crisis period, marked increase in 2020 and no significant change in 2021.
Food security	% population experiencing moderate or severe food insecurity	% population	2015-2021	↓	↑	Steady and marked upward trend from 2018 to 2021.
	% population who cannot afford a healthy diet	% population	2017-2021	↓	↗	Upward trend from 2018 to 2020, and marginal decline in 2021.

\* Average crisis period compared to pre-crisis average (2018-2019 depending on data availability)

Desirable direction: ↑ denotes a higher value is more desirable, ↓ denotes a lower value is more desirable. Actual direction: a blue arrow denotes no substantial changes and stable value, a green arrow (up/down) denotes a direction similar to the desirable one, a light green arrow (diagonal up/down) denotes a direction similar to the desirable one but less pronounced, a red arrow (up/down) denotes an opposite direction to the desirable one, an orange arrow (diagonal up/down) denotes an opposite direction to the desirable one but less pronounced

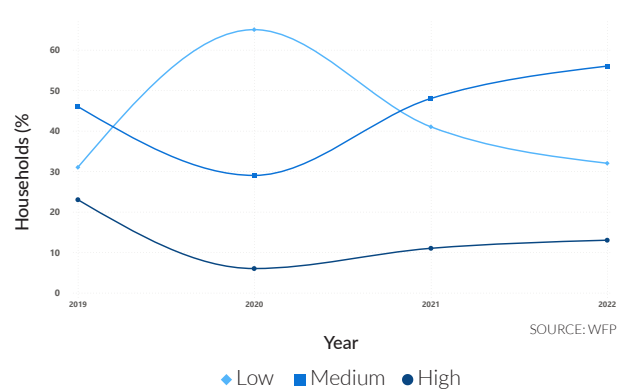
IFPA = indicator of food price anomalies; Kcal= kilocalories

Figure 8: Households' livelihood coping strategies 2019-2022, country level



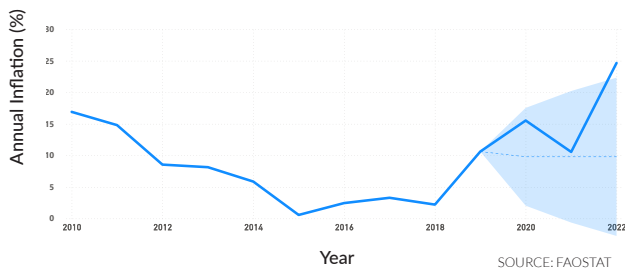
None: households not adopting coping strategies; Stress: households adopting stress coping strategies; Crisis: households adopting crisis coping strategies; Emergency: households adopting emergencies coping strategies

Figure 9: Reduced Coping strategies index (rCSI) 2019-2022, country level



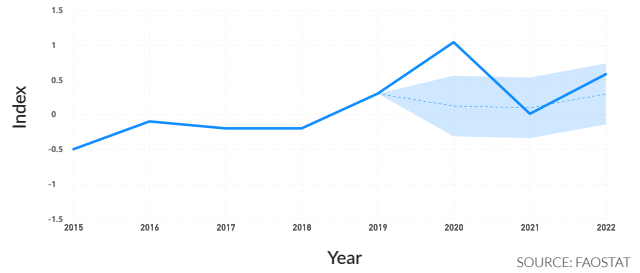
Low coping strategy (rCSI=0-3); Medium coping strategy (rCSI=4-18); High coping strategy (rCSI>18)

Figure 10: National food price inflation 2010-2022



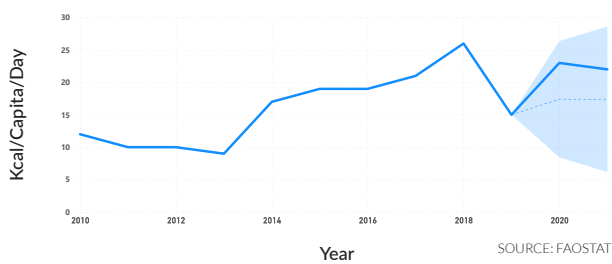
The plain line is the actual trend observed, while the dotted line is a projected trend based on pre-crisis data, presented with the 95% confidence interval (the shaded area)

Figure 11: Food Price Anomalies (IFPA) 2015-2022 - Wheat, country level



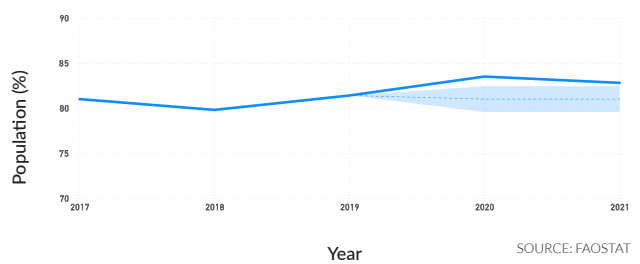
The plain line is the actual trend observed, while the dotted line is a projected trend based on pre-crisis data, presented with the 95% confidence interval (the shaded area)

Figure 12: Per capita food supply variability 2010-2021, country level



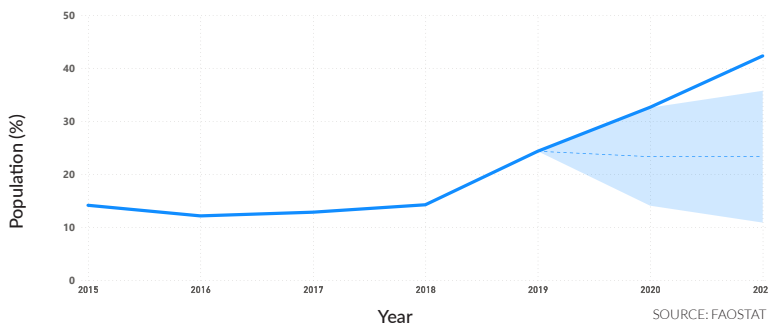
The plain line is the actual trend observed, while the dotted line is a projected trend based on pre-crisis data, presented with the 95% confidence interval (the shaded area)

Figure 13: National share of the population unable to afford healthy diet 2017-2021



The plain line is the actual trend observed, while the dotted line is a projected trend based on pre-crisis data, presented with the 95% confidence interval (the shaded area)

Figure 14: Prevalence of moderate or severe food insecurity in the total population 2015-2021



The plain line is the actual trend observed, while the dotted line is a projected trend based on pre-crisis data, presented with the 95% confidence interval (the shaded area)

## CONTEXTUAL SPECIFICITIES AND VULNERABILITIES

Pakistan is significantly affected by climate-related disasters. In particular, drought emergencies occurring over several years have led to severe water shortages. These conditions have significant implications for agriculture, as the demand for water often exceeds its availability, leading to a reduction in irrigated land and crop production. In some areas of the country, even the river flow is insufficient to meet irrigation needs. Simultaneously, Pakistan faces devastating floods, which contribute to an increased portion of the population experiencing food insecurity. Floods not only disrupt the irrigation networks but also damage roads leading to markets, schools, and hospitals. WFP is working to restore and improve the irrigation systems that were disrupted by the 2022 floods and rehabilitate access roads for the affected communities.

Pakistan also faces challenges with staple crops. For example, the price of wheat, Pakistan's primary staple food, remains highly unstable. Notably, there is a lack of a clear and consistent policy or strategy concerning wheat within the country. The governmental provides incentives for wheat production to farmers, but these initiatives can fluctuate from year to year, often in response to monthly market price variations. Furthermore, there is a lack of oversight regarding the export of wheat and flour to neighbouring

countries, as these activities are often under the influence of non-state actors or informal networks in the region. This contributes to rising prices within Pakistan.

Another critical issue is the limited food storage capacity, both at the household and governmental levels. In 2022, the government stored surplus wheat stocks in high-risk areas which were ultimately affected by climate-related disasters, resulting in the surplus of wheat being spoiled. These climate shocks also contributed to the spoilage of household supplies. This situation underscores the need to enhance storage capacities for staple food at both the community and regional levels.

Additionally, it is relevant to acknowledge the regional disparities within Pakistan. The majority of wheat production is concentrated in Punjab, while other provinces rely on wheat from Punjab. This discrepancy underscores the absence of clear policies or strategies governing the equitable distribution of wheat to meet the needs of these provinces.



## Impact on food system: further results

In line with food price inflation (Figure 10), food prices have risen in a steep curve since the start of the crisis. In 2023, the mean food prices at national level for the food commodities had almost tripled compared to the baseline (average 2017-2018). The trend is similar across the 4 provinces but varies across food items: prices of oil (cooking) and wheat flour have sustained the largest mark up (more than 200% baseline price) while the prices rise of rice, pulses, and eggs have been lower, but nonetheless considerable (around 150% baseline price) (Figures 15, 16).

Surprisingly, food price inflation seems not to have translated into higher food expenditure (out of total spending), which remained between 35% and 40% during the crisis, although households devoting more than 75% of their overall budget increased by around 30% in 2020 – which indicates an exacerbation of households' economic vulnerability – and fell back to 2019 level the next two years (Figure 17 and 18). Furthermore, the downward trend of cost of living occurring pre-crisis has suffered a slowdown in 2020-21 before resuming in 2022 (Figure 19). Households' income however seems not to have been affected to the same extent, but national averages may conceal disparities within the country or among specific population groups, for example the most vulnerable (Figure 20).

Likewise, the current crisis and rise in prices seem not to have impacted volumes of food sales, which followed similar trends to the pre-crisis period: volumes of NCD-risk food sales remained stable and at a low level (between 21 and 25 Kg per capita in 2020-2022) while volumes of NCD-protect food sales continued to rise steadily (from 169 in 2019 to 193 Kg per capita in 2022), following the projected trend (Figure 21). Other vegetables and other fruits represent the majority of NCD-protect food sales, while SSB dominates NCD-risk food sales (Figure 22).

With regard to households' food consumption, proportion with acceptable food consumption score (FCS) increased by almost 50% in 2020 (from 20% in 2019 to 69% in 2020) and then fell back to around 40% in 2021-22, while those with border FCS declined by 22% between 2019 and 2022 (from 54% to 32%) and proportion with poor FCS has been halved in 2020-21 but rebounded in 2022 to reach 2019 level (27%). However, these findings should be interpreted with caution, as the data collection in 2020 covered a single and different province (Khyber-Pakhtunkhwa) than the other years, where Balochistan and Sindh were also included. This might partially explain the unexpected shift observed in 2020 (Figure 23).

Our survey in Pakistan focused on the challenges faced by urban food vendors during the crisis in Islamabad and Peshawar. It revealed varying impacts on urban food vendors, with disruptions caused by reduced customer traffic, store closures, and lockdowns. These disruptions have had a significant economic impact on these businesses, resulting in varying income reductions. Despite the challenges, operational cost reductions were limited, but vendors adapted by diversifying products, introducing new items, sharing workforces, and using new distribution methods.

It is important to acknowledge that although the capital cities were chosen for their diverse populations and economic significance, these results need to be interpreted with caution as they might not be representative of all food vendors in the country.

### FOOD PRICES AND COST OF DIET

Figure 15: Changes in prices 2011-2023 (2017-2018 = 100), 5 food commodities, country level and 4 provinces

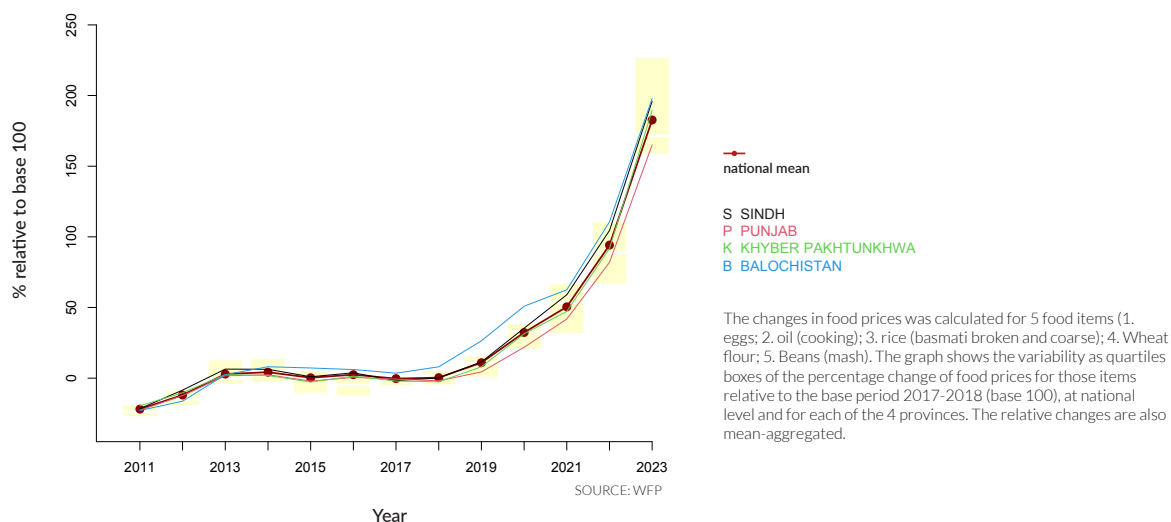
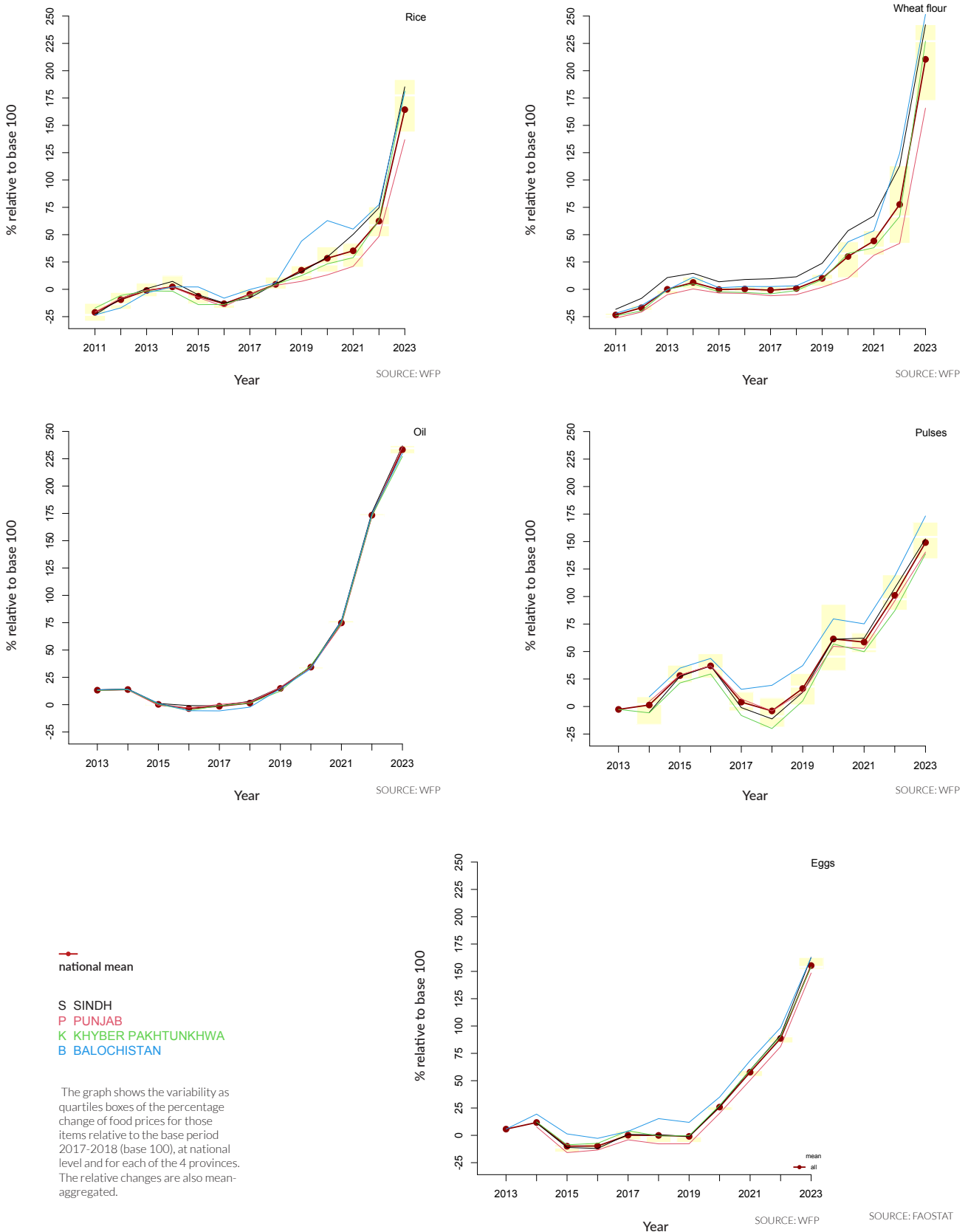
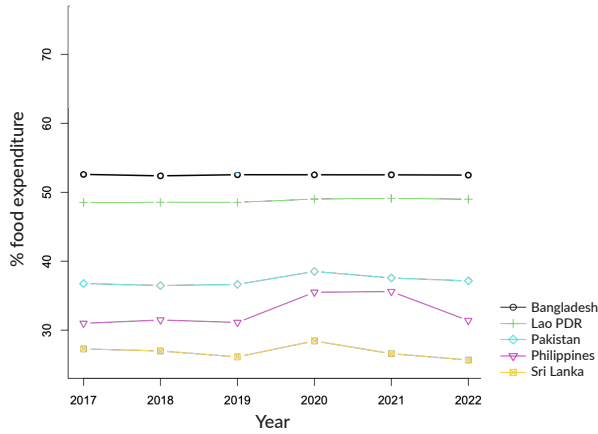


Figure 16: Changes in food prices 2011-2023 (2017-2018 = 100), by food commodities, country level and 4 provinces



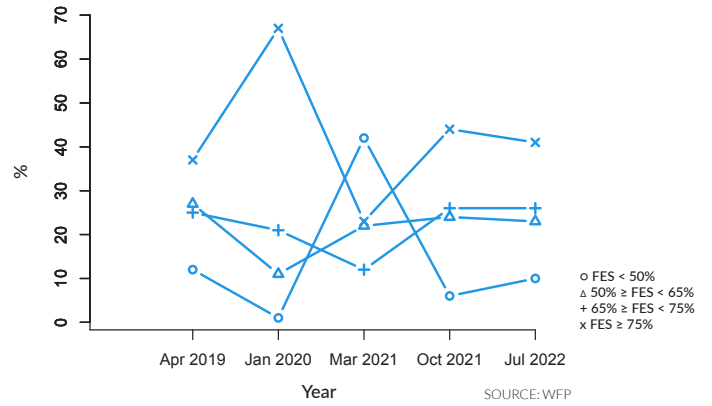
## FOOD EXPENDITURE AND FOOD SALES

Figure 17: Household food expenditure share, 2017-2022, 5 countries



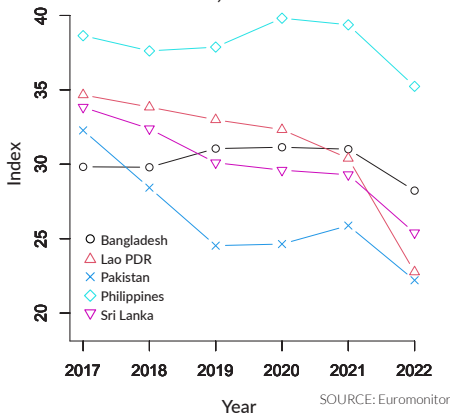
The food expenditure share (FES) as a single % score is displayed with the national average and subnational estimates. The box plots represent the subnational variability of the FES with the limit of the boxes being the 3 quartiles (25%, median as a white line and 75%).

Figure 18: Household food expenditure share by category, 2019-2022, country level



This indicator measures the proportion of each household's available budget (estimated through an expenditure module) spent on food, out of total expenditure. FES = Food expenditure share

Figure 19: Cost of living index by income (internationally comparable) 2017-2022, 5 countries



This figure presents cost of living overall (not disaggregated by deciles)

Figure 20: Urban and rural disposable income 2015-2022, 6 countries

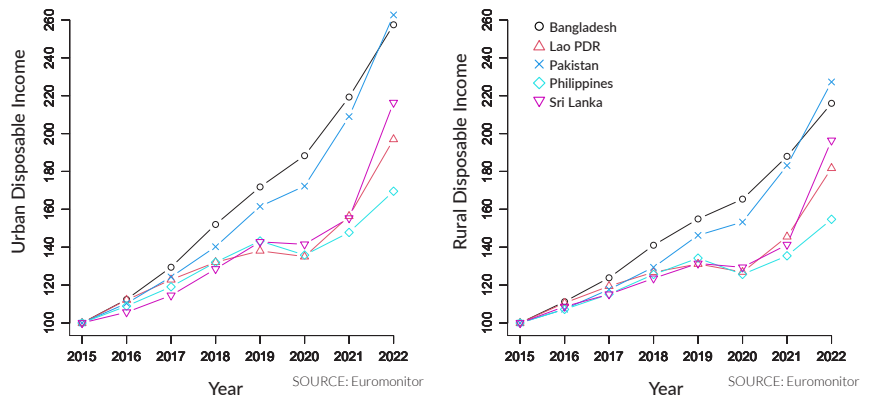
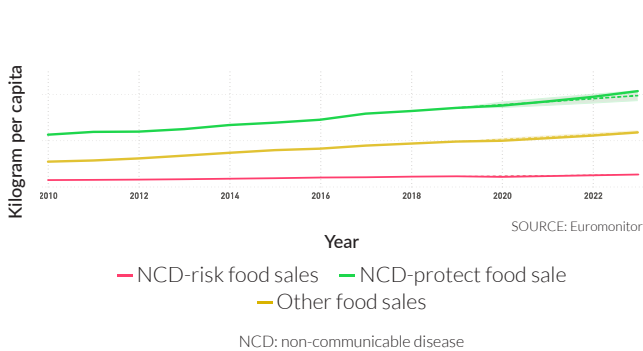
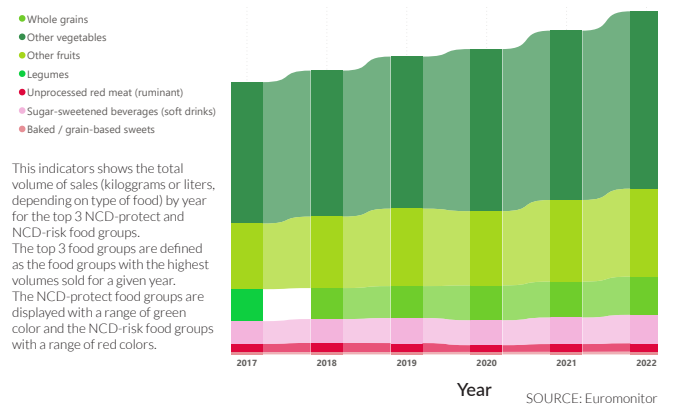


Figure 21: Food sales 2010-2023, country level



NCD: non-communicable disease

Figure 22: Country-level food sales 2017-2023 (volume per capita), top 3 NCD-protect and NCD-risk food groups



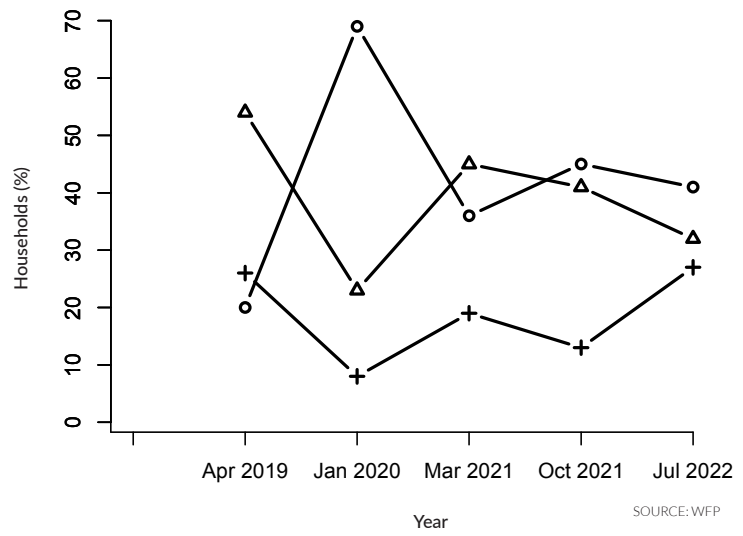
This indicators shows the total volume of sales (kilograms or liters, depending on type of food) by year for the top 3 NCD-protect and NCD-risk food groups. The top 3 food groups are defined as the food groups with the highest volumes sold for a given year. The NCD-protect food groups are displayed with a range of green color and the NCD-risk food groups with a range of red colors.

## FOOD SECURITY AND DIETS

Figure 23: Households' food consumption scores 2019-2022, country level

FCS=Food Consumption Score

- Acceptable (FCS>42)
- △ Borderline (FCS=28.001-42)
- + Poor (FCS<28)



## OPPORTUNITIES FOR BUILDING FOOD SYSTEM RESILIENCE

### PRICE STABILIZATION MECHANISMS

Implement and enforce consistent pricing and market policies for staple crops, such as wheat. This would reduce price volatility and ensure food affordability for the population, especially during times of crisis.

### EXPORT CONTROL MEASURES

Regulate and monitor the export of key food commodities, like wheat and flour, to prevent supply shortages domestically. This can help maintain food availability and stability within Pakistan.

### ENHANCED STORAGE FACILITIES

Invest in improving storage capacities at both household and governmental levels. Adequate storage will help safeguard food supplies during natural disasters and crises, reducing food losses and ensuring long-term food security.

### REGIONAL EQUITABILITY

Develop policies to distribute food commodities more equitably among provinces. Focusing on regions that are highly dependent on food imports can help ensure that everyone has access to essential food items.

### SOCIAL SAFETY NETS

Strengthen social safety nets and income support programs, especially for low-income and vulnerable populations. These programs can provide a buffer during economic downturns and help ensure that people can afford a healthy diet.

### COMMUNITY-BASED DISASTER PREPAREDNESS

Foster community-based disaster preparedness and resilience-building programs. These initiatives can help communities respond more effectively to natural hazards and protect their food systems.

### CLIMATE-RESILIENT AGRICULTURE

Promote climate-resilient agricultural practices, such as drought-resistant crop varieties and water-saving techniques, to mitigate the impact of climate change on food production. Prioritize the rehabilitation and maintenance of irrigation systems to mitigate the impact of flooding and ensure a consistent water supply for agriculture.





# Notes on methodology

## DATA SOURCES AND METHODOLOGY

**For assessing the impact of food and economic crises on diets among vulnerable groups across urban and rural areas in selected countries**, we employed a multi-faceted methodology. **Primary Data Collection:** We conducted food vendor surveys in various cities to understand how the COVID-19 pandemic and the Russia-Ukraine conflict affected businesses in the food sector. **Secondary Data Analysis:** We analyzed data from diverse sources, including food trade data, the Euromonitor International market sales database, and Cost of Diet data from the Fill the Nutrient Gap (FNG) initiative by WFP RBB. This analysis helped us examine changes in food imports, assess sales of both healthy and unhealthy food items, and study the affordability of diets, particularly for vulnerable groups. **Modeling:** We utilized economic shocks models to explore how change in food imports and sales affect food security and diets. We used techniques like Principal Component Analysis, Canonical Correlation Analysis, t-SNE, and Multivariate Random Forest to understand how changes in the food environment, income, and inflation influence food security.

**To evaluate food system resilience**, we selected specific indicator domains, curating data from various sources to understand changes over time and trends. We assessed food system resilience through various indicators, covering economic stability, natural disaster impact, COVID-19 stringency, domestic food production, imported food percentages, infrastructure, social capital, coping strategies, food price volatility, food supply stability, and food security. These indicators provided a comprehensive perspective on resilience across economic, environmental, and social dimensions. We also conducted semi-structured interviews with experts from WFP country offices to gather qualitative insights and identify opportunities to enhance resilience. Ethical standards were upheld throughout the study, with participants providing consent, data privacy and confidentiality being respected. Our research adhered to the TRUST code, a global code of conduct for equitable research partnerships.

The research was conducted between January 2023 and November 2023.

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## LIMITATIONS

For some indicators, there was limited data available, which restrained the ability to conduct further analyses on specific food system areas or to assess the impact of the current crisis. For example, several indicators for food system resilience only had data available up to 2020 or 2021 (e.g., domestic production, fertilizer consumption, food import, food supply variability), therefore the effect of the war in Ukraine - which started in February 2022 - could not be captured.

For indicators related to coping strategies, food expenditure share by category, and food consumption score, data collection did not cover the 4 provinces (Punjab was excluded), therefore results presented might not be representative of the entire country. Moreover, timing of data collection and provinces targeted varied across years: Sindh and Balochistan were included in 2019, only Khyber-Pakhtunkhwa was included in 2020, and data was collected for those 3 provinces in October 2021 and 2022. This may affect the interpretability of the findings presented.

With respect to most indicators, the analysis was conducted at the level of the country, potentially masking subnational variabilities (e.g., across different regions, or across urban/rural areas) and/or disparities among specific groups (e.g., most vulnerable groups). Further research would be warranted to shed light on these variations.

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## DEFINITIONS OF KEY TERMS

**Crisis period:** the on-going food and economic crisis results from a combination of two main shocks: the COVID-19 pandemic (from March 2020) and the Ukraine and Russia war (from February 2022).

**Food system:** "all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the output of these activities, including socio-economic and environmental outcomes" (HLPE, 2017).

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## INDICATOR DEFINITIONS

Indicator domain	Indicator	Definition	Data source
Exposure to shocks	Exchange rate	Annual exchange rates. Local currency units per US dollar.	FAOSTAT
	Ratio of affected people to the total population	Natural disasters include biological (animal accident, epidemic, insect infestation), climatological (drought, glacial lake outburst, wildfire), geophysical (earthquake, mass movement - dry, volcanic activity), hydrological (flood, landslide, wave action), and meteorological disasters (storm, extreme temperature, fog).  Total people affected include the total of injured (including hospitalization), affected (number of houses damaged multiplied by the family size), and homeless people (number of houses destroyed multiplied by the family size).  Note: proportion of the total population may be an overestimation, as people may have been counted more than once for a given year, if they have been affected by different natural disasters throughout that year	EM-DAT
	COVID-19 Stringency Index	Composite indicator calculated by using nine scaled indicators, including eight containment and closure policy indicators (school closing, workplace closing, cancel public events, restrictions on gatherings, close public transport, stay at home requirements, restrictions on internal movement, and international travel controls) and one indicators of public information campaigns, rescaled to a value from 0 to 100 (100 = strictest).	OxCGRT
	COVID-19 Economic Support Index	Composite measure based on four indicators: direct transfers to people not working due to the pandemic; debt relief for households; fiscal spending to stimulate the economy; and international support, rescaled to a value from 0 to 100 (100 = highest).	OxCGRT
Resilience capacities and agro-food diversity	Crop production index (2014-2016 = 100)	Agricultural production for each year relative to the base period 2014-2016. It includes all crops except fodder crops. Regional and income group aggregates for the FAO's production indexes are calculated from the underlying values in international dollars, normalized to the base period 2014-2016.	World Bank
	National crop production (gross harvest)	Quantity of plant nutrients used per unit of arable land. Fertilizer products cover nitrogenous, potash, and phosphate fertilizers (including ground rock phosphate). Traditional nutrients--animal and plant manures--are not included.	WFP <sup>b</sup>
	Fertilizer consumption	Includes meat and milk from all sources, dairy products such as cheese, and eggs, honey, raw silk, wool, and hides and skins. It shows the relative level of the aggregate volume of agricultural production for each year in comparison with the base period 2014-2016.	World Bank
	Livestock production index (2014-2016 = 100)	Includes meat and milk from all sources, dairy products such as cheese, and eggs, honey, raw silk, wool, and hides and skins. It shows the relative level of the aggregate volume of agricultural production for each year in comparison with the base period 2014-2016.	World Bank
	Food import NCD-protect, NCD-risk food groups	This indicator was created using the data available in the United Nation's Comtrade database. Annual food import data was downloaded with the Harmonized System (HS) Codes 6-digits that is a standardized numerical method of classifying traded products. These commodity groups were re-categorized into standard Diet Quality Questionnaire (DQQ) food groups. Classification as NCD-risk and NCD-protect food groups was done based on the Global Dietary Recommendations (GRD) guideline.  NCD-Protect: foods protective against noncommunicable diseases (whole grains; legumes/pulses; vitamin A-rich orange vegetables; dark green leafy vegetables; other vegetables; vitamin A-rich fruits; citrus; other fruits; nuts and seeds). NCD-Risk: foods related to noncommunicable diseases (baked/grain-based sweets; other sweets; processed meat; unprocessed red meat - ruminant; unprocessed red -non ruminant; packaged ultra-processed salty snacks; instant noodles; sugar-sweetened beverages).	UN Comtrade
	Mobile cellular subscription	Mobile cellular telephone subscriptions are subscriptions to a public mobile telephone service that provide access to the PSTN using cellular technology. The indicator includes (and is split into) the number of postpaid subscriptions, and the number of active prepaid accounts (i.e. that have been used during the last three months). The indicator applies to all mobile cellular subscriptions that offer voice communications. It excludes subscriptions via data cards or USB modems, subscriptions to public mobile data services, private trunked mobile radio, telepoint, radio paging and telemetry services.	World Bank
	Social capital index	A composite index based on a subset of indicators from the Social Capital pillar of the Legatum Prosperity Index, which assesses social cohesion and engagement, community and family networks, and political participation and institutional trust. The index is scaled to a value that ranges from 0 (low) to 100 (high).	Legatum Institute/ FSCI
Resilience responses and strategies	Reduced Coping Strategy Index (rCSI)	Measure of the frequency and severity of household behaviors when faced with shortages of food or financial resources to buy food. It is calculated using five standard food consumption-based strategies and severity weighting, a higher score indicates more frequent and/or extreme negative coping strategies.	WFP <sup>b</sup>
	Livelihood coping strategy - Food security	Indicator used to understand households' medium and longer-term coping capacity in response to lack of food or lack of money to buy food and their ability to overcome challenges in the future. The indicator is derived from a series of questions regarding the households' experiences with livelihood stress and asset depletion to cope with food shortages.	WFP <sup>b</sup>

Indicator domain	Indicator	Definition	Data source
Longer-term resilience outcomes	Food price inflation <sup>a</sup>	Inflation is measured in terms of the annual growth rate and in index, 2015 base year.	FAOSTAT
	Food Price Anomalies (IFPA), by type of product (Rice)	Identifies market prices that are abnormally high. The IFPA relies on a weighted compound growth rate that accounts for both within year and across year price growth. The indicator directly evaluates growth in prices over a particular month over many years, taking into account seasonality in agricultural markets and inflation, allowing to answer the question of whether or not a change in price is abnormal for any particular period.	FAOSTAT
	Food Price Anomalies (IFPA), by type of product (Wheat)		FAOSTAT
	Food supply variability <sup>a</sup>	This indicator uses the data on dietary energy supply from the Food Balance Sheet to measure annual fluctuations in the per capita food supply (kcal), represented as the standard deviation over the previous five years per capita food supply. Food supply variability results from a combination of instability and responses in production, trade, consumption, and storage, in addition to changes in government policies such as trade restrictions, taxes and subsidies, stockholding, and public distribution.	FAOSTAT
	% population experiencing moderate or severe food insecurity	The prevalence of moderate or severe food insecurity is an estimate of the percentage of people in the population who live in households classified as moderately or severely food insecure. The assessment is conducted using data collected with the Food Insecurity Experience Scale (FIES) or a compatible experience-based food security measurement questionnaire. A household is classified as moderately or severely food insecure when at least one adult in the household has reported to have been exposed, at times during the year, to low quality diets and might have been forced to also reduce the quantity of food they would normally eat because of a lack of money or other resources.	FAOSTAT
	% population who cannot afford a healthy diet	Proportion of the population whose food budget is below the cost of a healthy diet. The food budget is defined as 52% of household income, based on the average share of income that households in low-income countries spend on food. Income data are provided by the World Bank's Poverty and Inequality Platform. A value of zero indicates a null or a small number rounded down at the current precision level.	FAOSTAT
Food prices and cost of diet	Changes in food prices	The changes in food prices was calculated for 5 food items (1. eggs; 2. oil (cooking); 3. rice (basmati broken and coarse); 4. Wheat flour; 5. Beans (mash).	Economic: Prices-Dataviz WFP - VAM <sup>b</sup>
Food expenditure, income and food sales	Per capita food expenditure share	Indicator used to measure households' economic vulnerability. It determines the economic vulnerability without the need of having a reference to a poverty line or minimum expenditure basket. The higher the share of households' consumption expenditures on food - out of the total consumption expenditure - the more vulnerable the households are to food insecurity.	WFP FSOM <sup>b</sup>
Food expenditure, income and food sales	Cost of living	Cost of Living Index by Income (internationally comparable) is a price index that measures relative cost of living over time in a chosen income decile. Cost of Living Index is a weighted average of Index of Consumer Prices by category and consumer expenditure by income deciles, adjusted to Price Level Index.	Euromonitor
Food expenditure, income and food sales	Income	Disposable income is gross income less social security contributions and income taxes.	WFP <sup>b</sup>
Food expenditure, income and food sales	Food sale (volume per capita)	This indicator was created using the data in Euromonitor International database <a href="https://www.euromonitor.com/">https://www.euromonitor.com/</a> . Market research data on food sales was downloaded and food groups were categorized into standard Diet Quality Questionnaire (DQQ) food groups. Classification as NCD-risk and NCD-protect food groups was done based on the Global Dietary Recommendations (GRD) guideline. NCD-Protect: foods protective against noncommunicable diseases (whole grains; legumes/pulses; vitamin A-rich orange vegetables; dark green leafy vegetables; other vegetables; vitamin A-rich fruits; citrus; other fruits; nuts and seeds). NCD-Risk: foods related to noncommunicable diseases (baked/grain-based sweets; other sweets; processed meat; unprocessed red meat - ruminant; unprocessed red -non ruminant; packaged ultra-processed salty snacks; instant noodles; sugar-sweetened beverages).	WFP <sup>b</sup>
Food security and diets	Food consumption score	This indicator is associated with household food access, and is therefore a proxy for household food security. The FCS is used to classify households into three groups: poor, borderline or acceptable food consumption. These food consumption groups aggregate households with similar dietary patterns - in terms of frequency of consumption and diversity - and access to food.	WFP <sup>b</sup>

<sup>a</sup> Estimated data<sup>b</sup> Country level data



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