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RUAF

City region food systems: Responding to shocks and stresses

Insights from a global survey

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Insights from a global survey

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ACKNOWLEDGEMENTS

This analysis is conducted by Thierry Giordano (CIRAD), with contributions from the FAO CRFS team (Guido Santini, Carmen Zuleta Ferrari, Roman Malec, Isabella Trapani, and Jia Ni) and the Institute of Urban Agriculture of the Chinese Academy of Agricultural Sciences (Shulang Fei and Erli Wang).

INTRODUCTION

In recent years, food systems all over the world have faced significant disruptions due to various shocks, including the COVID-19 pandemic and the war in Ukraine. These global shocks have compounded existing local, regional, and national challenges already affecting food systems worldwide.

Food system actors have adopted a wide range of strategies and implemented concrete actions to respond to these shocks and stresses. To help identify effective responses to shocks and stresses to increase the resilience and sustainability of city region food systems (CRFS), FAO conducted a survey from June to July 2022, in collaboration with key City Networks (C40, ICLEI, Milan Urban Food Policy Pact, Resilience Cities, UCLG). This survey targeted all the actors of the food system, including local governments with the following four objectives:

- to better understand the most important impacts of the pandemic and other shocks and stresses on their city region food systems over the past few years;
- to identify individual reactions, collective initiatives and public policies to capture the diversity of responses;
- to identify the most important characteristics of their city region food systems that enabled these actions. These characteristics include the way food systems are governed; and
- to determine whether these individual or collective interventions contributed to an increase in the resilience and sustainability of their CRFS.

The survey was disseminated through several channels:

- the Food-for-cities D-Groups network, which gathers more than 4000 people working in or on city region food systems;
- social media accounts (Twitter, LinkedIn and Facebook) of the three research partners (FAO, RUAF and CIRAD);
- the international networks of cities (C40, ICLEI, Milan Urban Food Policy Pact, Resilience cities, UCLG).

The survey received 210 responses, of which 182 were included in this analysis following a database cleaning.

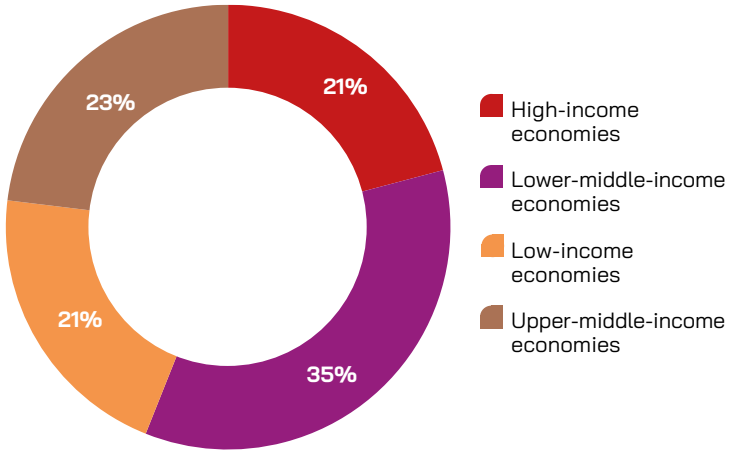
Origin of respondents

- The 182 responses come from 147 different cities: there were several respondents for one city.
- The diversity of respondents offer valuable insights across various contexts. However, the overall level of representation is relatively low, so the conclusions drawn from this survey should be considered as preliminary hypotheses to be validated through further research.
- Several criteria can be used to characterize the sample.

The World Bank classification for 2022[1] was used to assess the income level of the countries where the cities are located. The proportion of respondents range from 21 percent in high-income and low-income countries, to 35 percent in lower-middle-income countries. The sample is relatively well balanced.

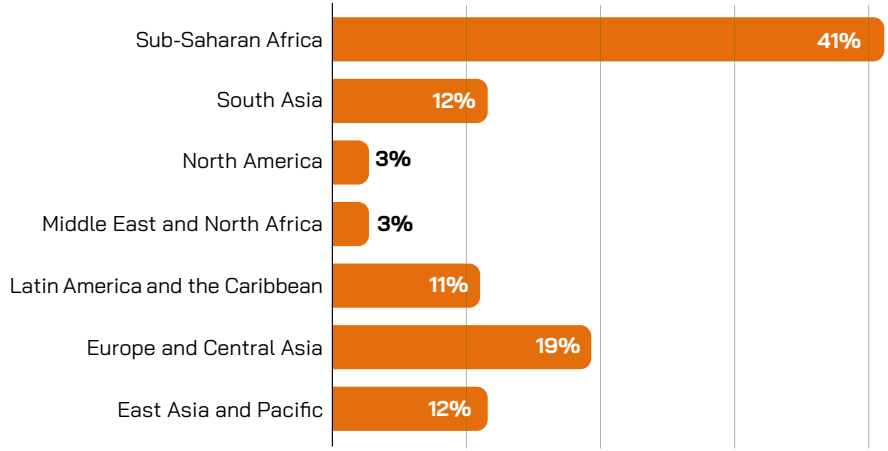
The World Bank geographical classification[1] was used to determine the distribution of respondents. The sample is clearly skewed towards Sub-Saharan Africa which garners 40 percent of the respondents, followed by Asia (24 percent) and Europe and central Asia (19 percent).

Figure 1. Distribution of survey respondents according to national income levels



Source: Author's own elaboration.

Figure 2. Geographical distribution of survey respondents



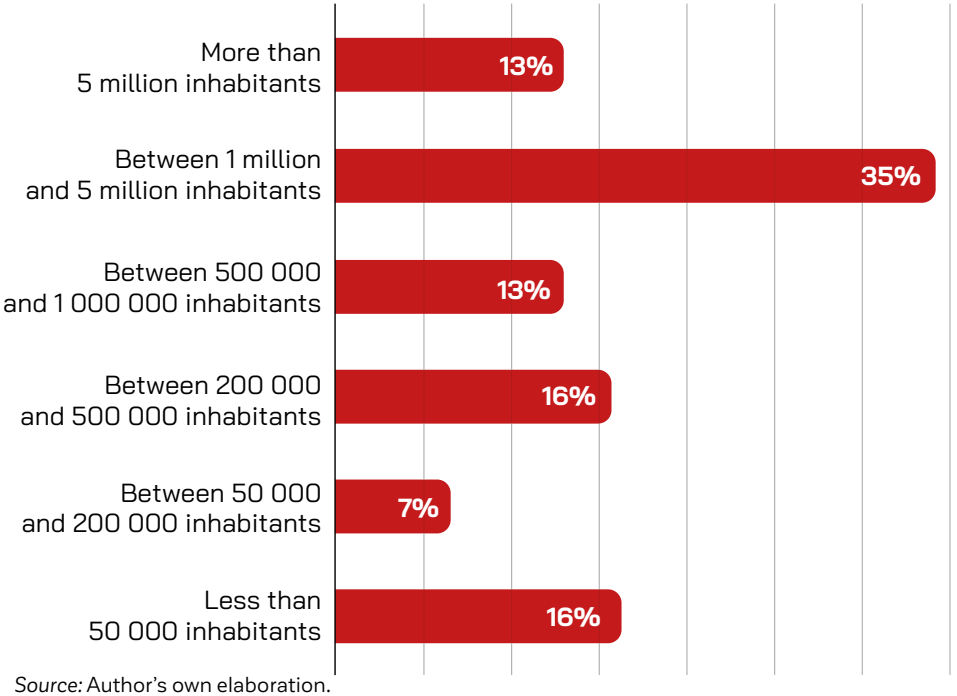
Source: Author's own elaboration.

[1] See: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

Origin of respondents

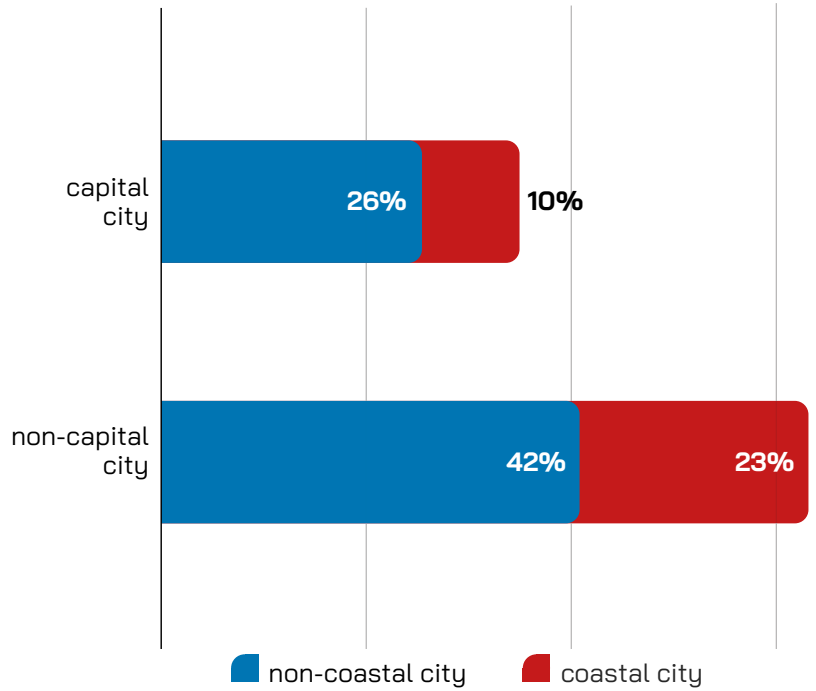
- The 147 cities are in 69 countries, with 34 of them being represented through multiple cities.
- The most represented countries are India and Nigeria (9 cities), Spain (7 cities), the US and Italy (6 cities) and China (5 cities).
- Capital cities are overrepresented, with at least one respondent from each of the 65 capital cities among the 69 countries.
- Because capital cities tend to be the most populated cities, it is not surprising to have a dominance of large cities, with respondents from cities having more than 500 000 inhabitants amounting to 61 percent in our sample (111 cities). At the other end of the spectrum, 16 percent of the respondents are from cities with less than 50 000 inhabitants (30 cities).
- Whether cities are coastal or not is an important feature when it comes to sea-level rise and potential flooding. Thirty three percent of the cities are coastal cities, of which one third are also capital cities.

Figure 3. Distribution of survey respondents according to city population size



Source: Author's own elaboration.

Figure 4. Distribution of survey respondents according to city type

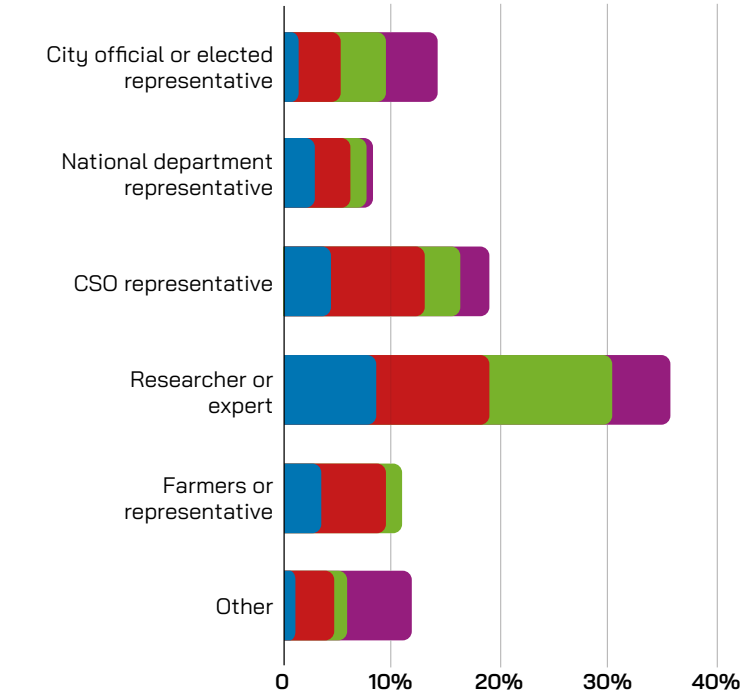


Source: Author's own elaboration.

Profile of respondents

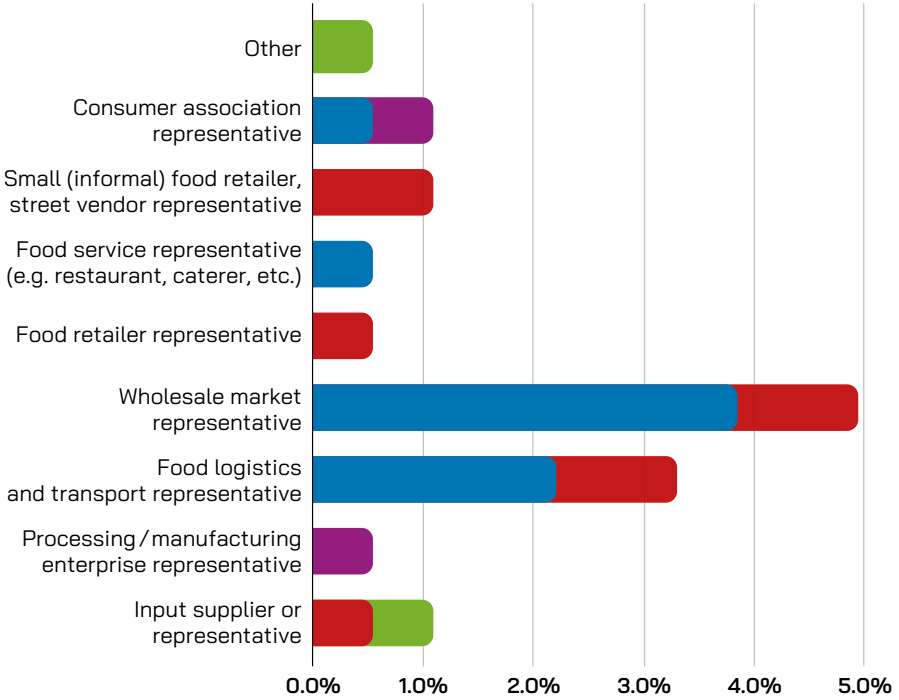
- The profile of respondents also shows a wide diversity. Experts and researchers dominate among the respondents (36 percent), followed by CSO representatives (19 percent), city officials or elected representatives (14 percent).
- The geographical distribution of the respondents according to their profile is important to notice: most CSO representatives, national government representatives, and farmer representatives come from low- and lower-middle-income economies, while the distribution for the other categories is much more balanced.
- Among city officials, respondents from upper-middle- and high-income economies dominate.
- The number of CRFS actors belonging to other segments of the food systems than those already mentioned is limited (right-hand graph). They come mainly from high-income economies. Wholesale market representatives amounted to nearly five percent of the respondents.

Figure 5. Profiles of survey respondents



Source: Author's own elaboration.

Figure 6. Profiles of survey respondents ("Other" category)



Source: Author's own elaboration.

WHAT ARE THE SHOCKS AND STRESSES AFFECTING FOOD SYSTEMS?

Methodological explanations

- This section deals with the perception CRFS actors have of the intensity of shocks and stresses that recently affected their food systems. The question asked was the following: "Over the past five years, have any [type of shocks or stresses] affected your city region's food system?"
- The list of shocks and stresses were were divided into seven categories (Table 1).
- Respondents were offered the possibility to answer yes/no/I don't know for each category. If the answer was yes, then a series of shocks and events were suggested for this category. Respondents could rate the perceived intensity of the shock or stress on a Likert scale from 1 to 10.
- The average intensity and the weighted average intensity (average intensity × the proportion of respondents mentioning the shock) as perceived by CRFS actors are presented in this document.

Table 1. Categories of shocks and stresses

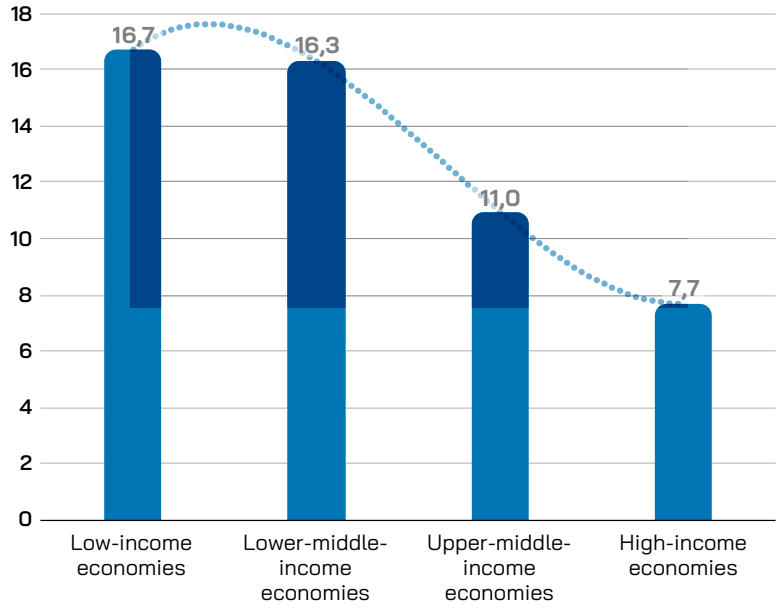
Categories of shocks and stresses
Public health and biological events (e.g. COVID-19)
Climate and weather-related events (e.g. floods, droughts)
Geological events (e.g. landslides, earthquakes)
Ecosystem-related events (e.g. biodiversity loss, ecosystem degradation)
Technological and/or industrial events (e.g. pollution-driven harm, industrial accidents)
Economic events (e.g. food price shocks, market disruptions)
Political and civic events (e.g. conflict, corruption, migration)

Source: adapted from United Nations. 2020. United Nations Common Guidance on Helping Build Resilient Societies. New York.
https://unsdg.un.org/resources/un-common-guidance-helping-build-resilient-societies

The perceived importance of shocks and stresses on CRFS

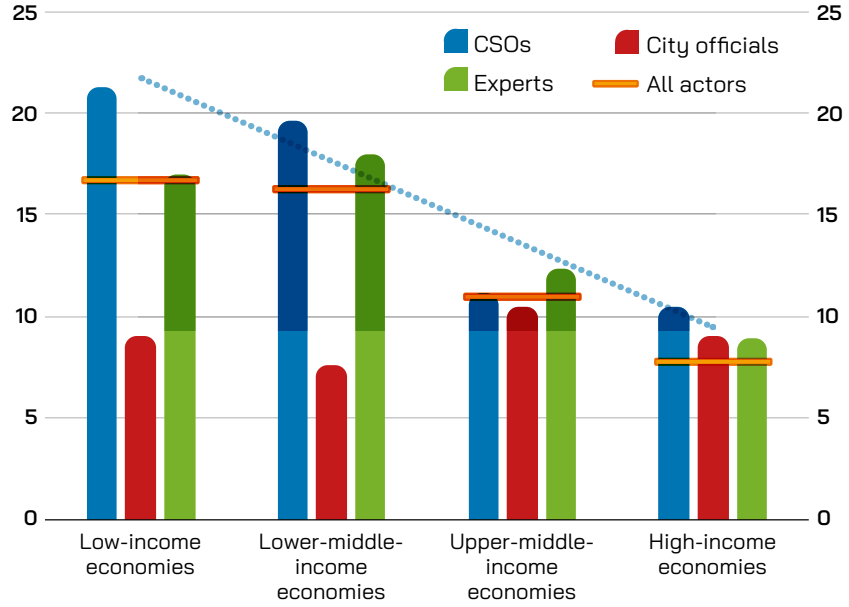
- Respondents ranked the significance of shocks and stresses on their CRFS over the past five years on a Likert scale from 1 to 10. In this analysis, significant shocks and stresses are defined by a rank of seven or above. The number of different shocks perceived, among the 54 we listed, over the last five years, are considered in this study.
- The number of different shocks perceived as significant seems to be related to the level of income, with a plateau for the lowest income category, before plummeting from lower- to upper-middle income economies: the lower the level of income, the more significantly respondents perceived the shocks.
- This pattern seems to depend on the type of actors. CSO representatives and experts or researchers seem to drive this trend.
- There seems to be a disconnect between the perception of CSOs and researchers on the one hand, and the perception of city officials on the other, in lower-income economies. City officials in lower-income economies seem to perceive some shocks with a lower intensity than CSOs or researcher which would explain the gap in the number of different shocks. This gap seems almost inexistent in higher-income economies.

Figure 7. Average perceived occurrence of significant shocks and stresses over the past five years



Source: Author's own elaboration.

Figure 8. Average occurrence of significant shocks and stresses over the past five years, as perceived by specific respondents

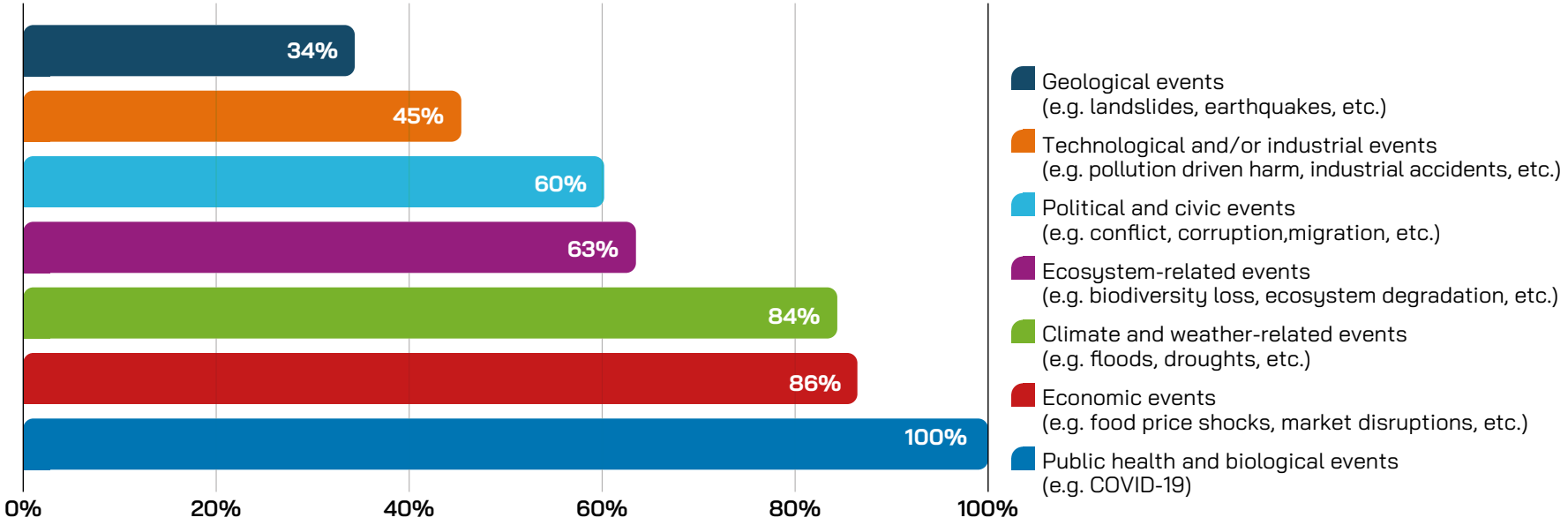


Source: Author's own elaboration.

Understanding the perceived diversity of shocks and stresses on CRFS over the past 5 years

- The responses reflect all seven broad categories of shocks mentioned in the survey, demonstrating the importance of considering them all when studying food system resilience. The ranking translates the relative importance of the different categories of shocks and stresses as they affect CRFS.
- Due to the global COVID-19 pandemic, public health and biological shocks are recorded as 100 percent.
- Economic shocks come second with 86 percent. It is important to note that economic shocks could be the consequence of other types of shocks (e.g. shock on food prices could be due to drought, limiting production). Therefore, this result could be due to the difficulty for the respondents in identifying primary shocks.
- Climate-related events came third, very close to economic shocks, demonstrating the significant influence of climate events on food systems.
- Ecosystem-related events are fourth, followed by political and civic events, emphasizing the importance of the state of nature for the functioning of food systems.

Figure 9. Share of respondents reporting shocks and stresses over the past 5 years by broad category

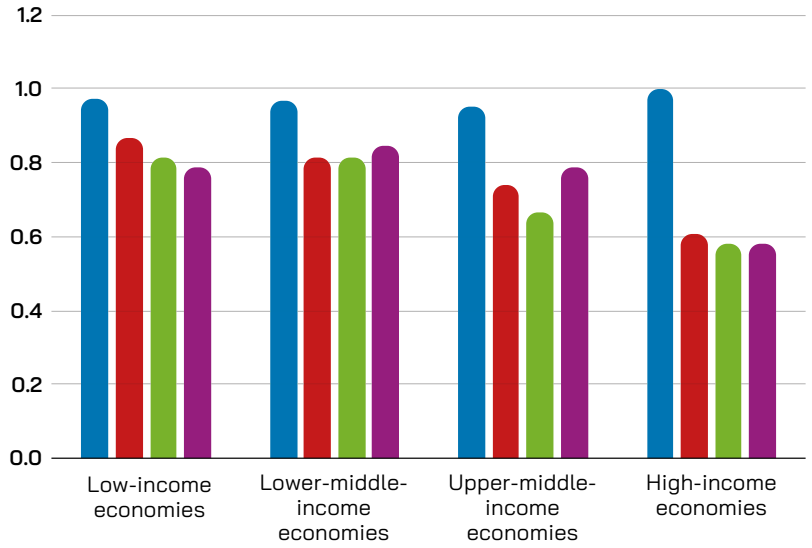


Source: Author's own elaboration.

Public health and biological shocks

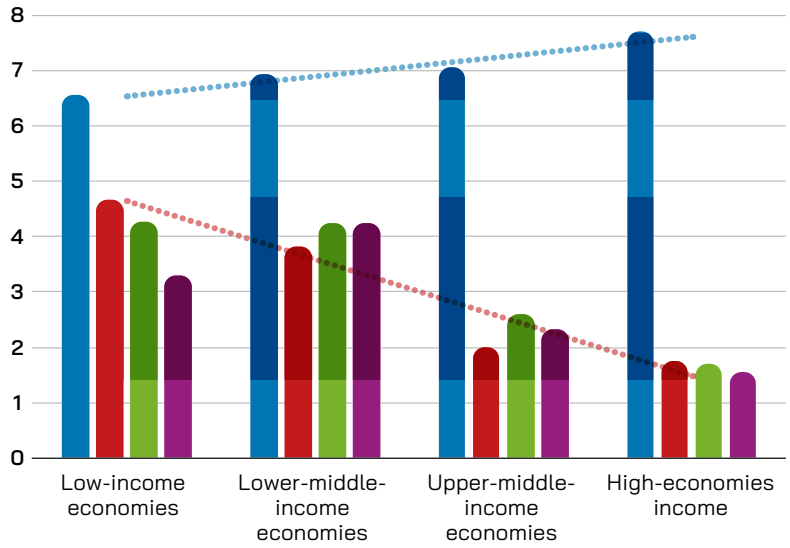
- The perceived intensity of the COVID-19 pandemic is far above other health and biological shocks and seems to increase with the level of income.
- Conversely, the perceived intensity of the other health and biological shocks decreases with the level of income. It seems that the higher the income level, the more prepared for these shocks economies are, and therefore the lower the perception of their intensity.
- The divergence of these two trends could come from the expected/non-expected nature of the different shocks which would then influence the level of preparedness, to the point where the intensity of these later shocks is perceived as limited (below two) in high-income economies.
- The difference in perceived intensity of plant pests and animal diseases and food safety events between the two higher-income categories and two lower-income categories is substantial.

Figure 10. Average perceived intensity of public health and biological shocks



Source: Author's own elaboration.

Figure 11. Weighted average perceived intensity of public health and biological shocks



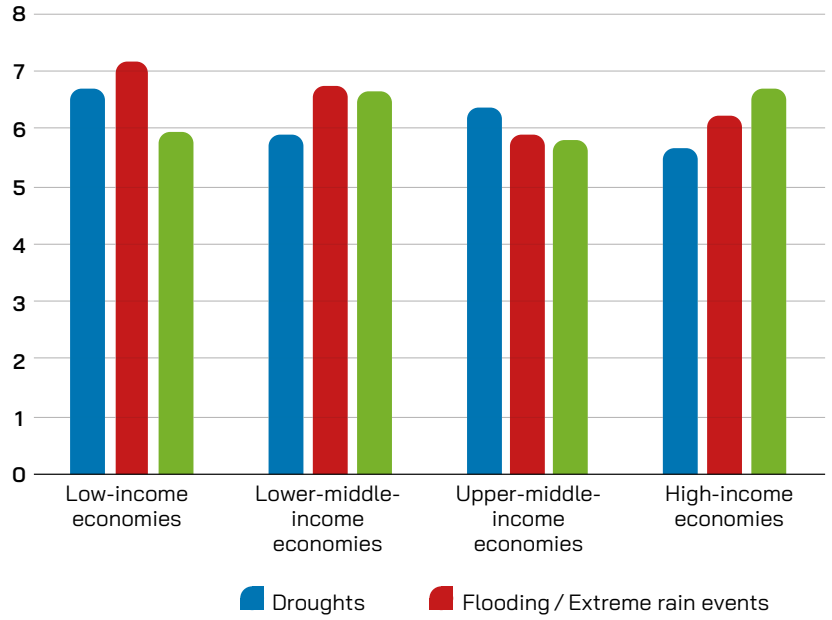
COVID-19 and other human epidemics and pandemics | Plant pests and diseases | Animal disease | Food safety events

Source: Author's own elaboration.

Climate and weather-related events

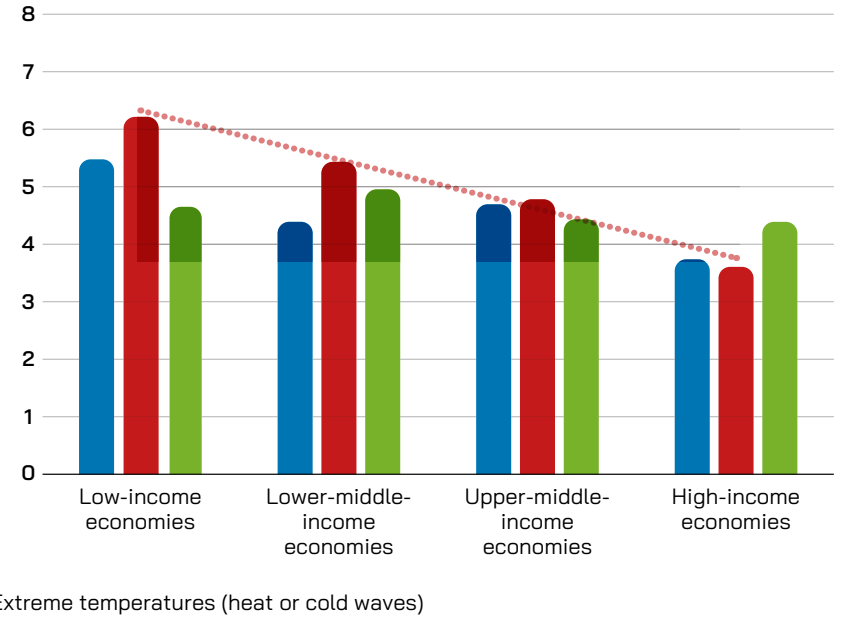
- Climate and weather-related events seem to be perceived as having the same intensity whatever the level of income, as no clear trends appear.
- The differences in intensity of shocks within this category are limited: all climate and weather-related shocks are perceived as being of middle to high intensity (mostly perceived between six and seven).
- However, these figures tend to change when the weighted average is considered. It is then perceived as higher in low-income economies.
- This difference is due to the proportion of respondents mentioning these events rather than the intensity of the event itself. In other words, more people perceive these events in lower-income economies than in high- income economies.
- However, the difference is limited. Except in high-income economies, where the intensity is between 3.6 and 4.4, respondents from other economies record perceived intensities between 4.4 and 5.4, except for floods in low-income economies perceived with an intensity of 6.2.
- The perceived intensity of floods and extreme rainfall events is clearly higher than droughts and extreme temperature events, except in high-income economies.

Figure 12. Average perceived intensity of climate and weather-related events



Source: Author's own elaboration.

Figure 13. Weighted average perceived intensity of climate and weather-related events

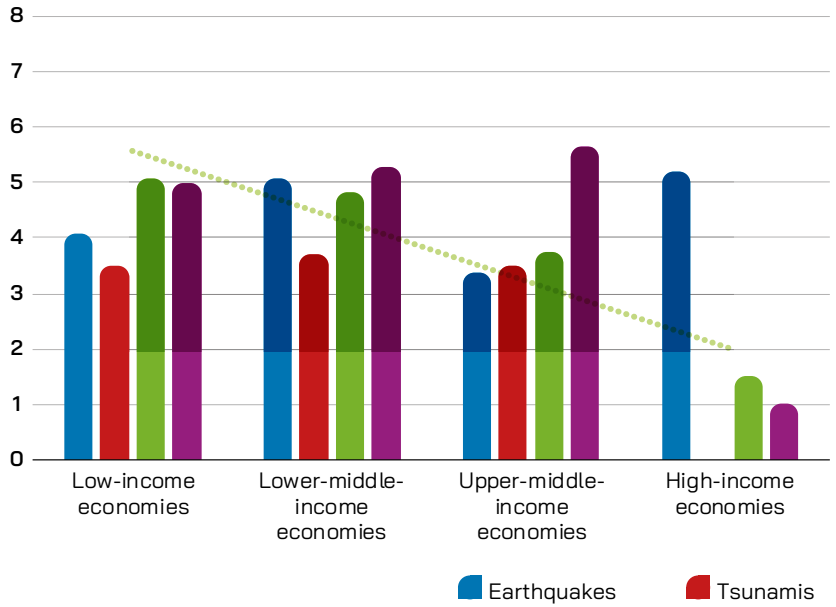


Source: Author's own elaboration.

Geological events

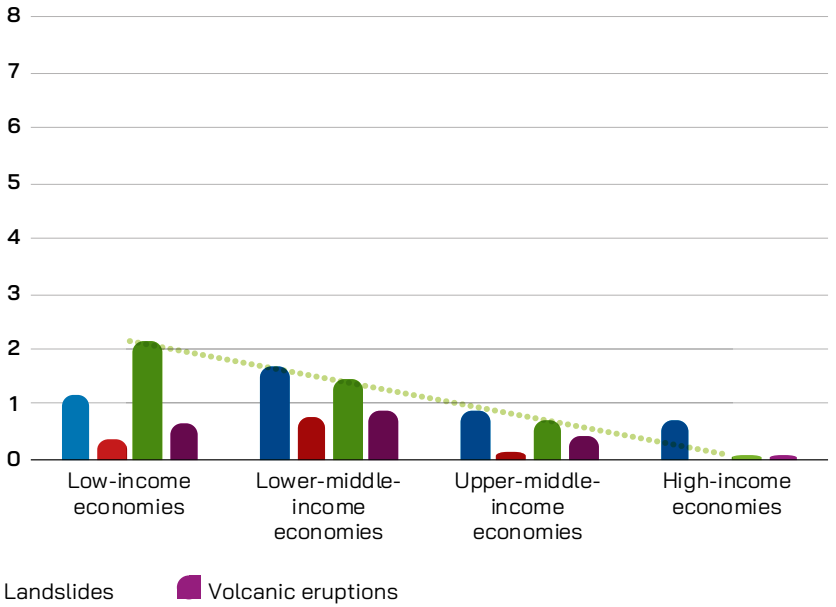
- There does not seem to be any pattern regarding the average intensity of geological shocks (such as earthquakes, tsunamis, landslides, volcanic eruptions). These shocks are perceived to be from low to medium intensity (mostly below five).
- The reason might be because most shocks are related to geological conditions which are very context specific (location of seismic zones or volcanoes, coastal cites vulnerable to tsunamis).
- Only landslides seem to be perceived differently depending on the level of income with a downward trend of the perceived intensity as the level of income of the economy increases.
- The weighted averages confirm the predominance of landslides as the most important geological events. The importance of landslides is consistent with the flooding and extreme rainfall events previously mentioned.
- There is a significant gap between the level of the weighted and non-weighted average perceived intensities, whatever the income level, that translates the low frequency of such events.
- These weighted averages are the lowest of all the seven shock categories.

Figure 14. Average perceived intensity of geological events



Source: Author's own elaboration.

Figure 15. Weighted average perceived intensity of geological events

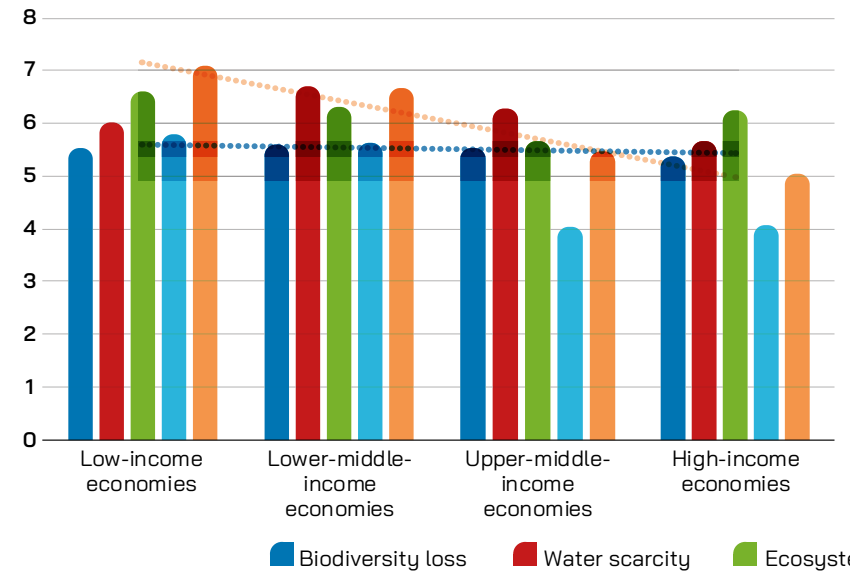


Source: Author's own elaboration.

Ecosystem-related events

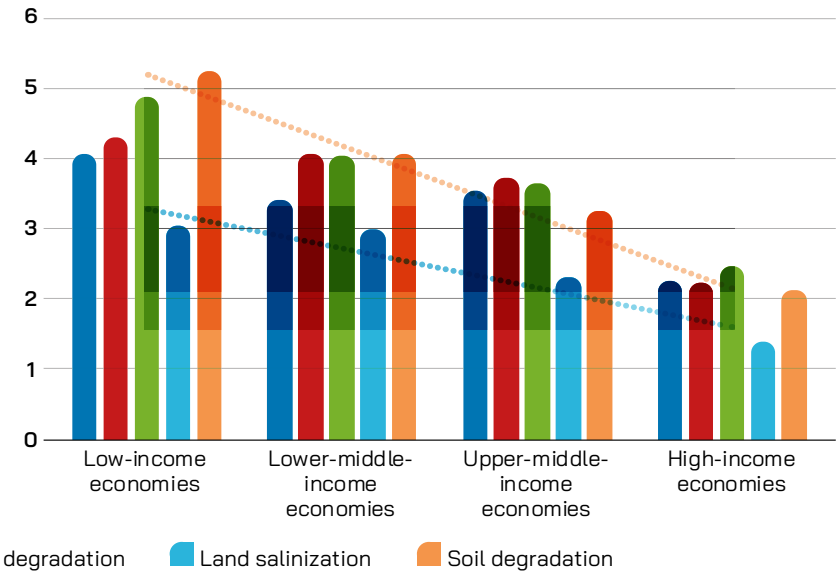
- This category has the particularity of including mostly stresses rather than shocks. They are closely linked to climate change events.
- Biodiversity loss, water scarcity, and ecosystem degradation display no specific trend when considering income differences.
- Conversely, land salinization and soil degradation tend to increase in intensity as the level of income decreases.
- The weighted averages display a different pattern as the five stresses seem to be conversely correlated to the level of income. This means that while their intensities are rather similar, they are more often perceived when the level of income decreases.
- Soil and ecosystem degradation clearly stand out as the most important stresses whatever the level of income, followed by water scarcity, two critical determinants of food production.

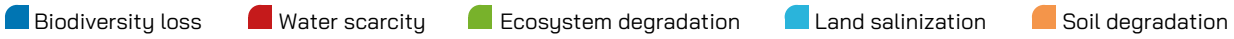
Figure 16. Average perceived intensity of ecosystem-related events



Source: Author's own elaboration.

Figure 17. Weighted average perceived intensity of ecosystem-related events



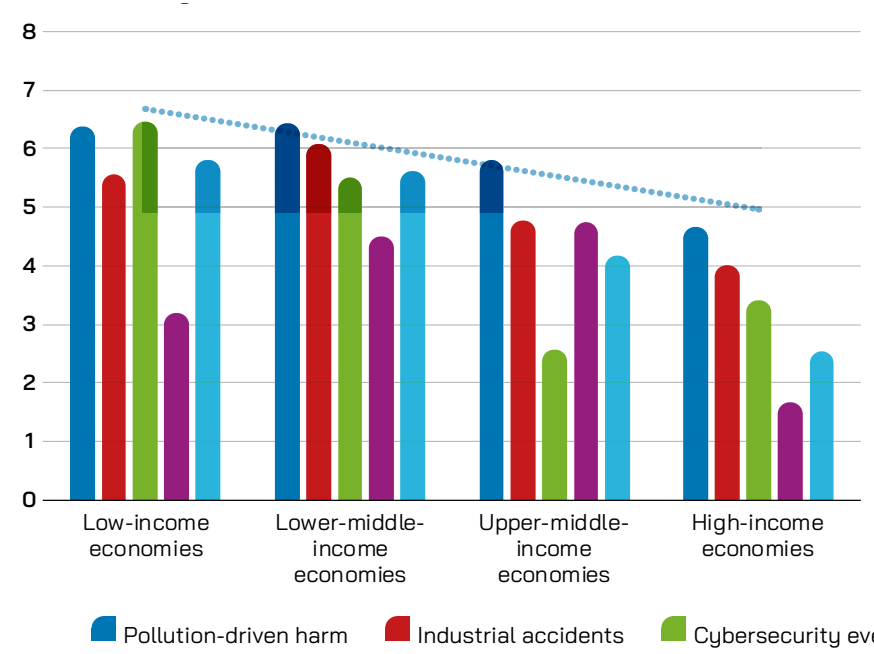


Source: Author's own elaboration.

Technological and industrial events

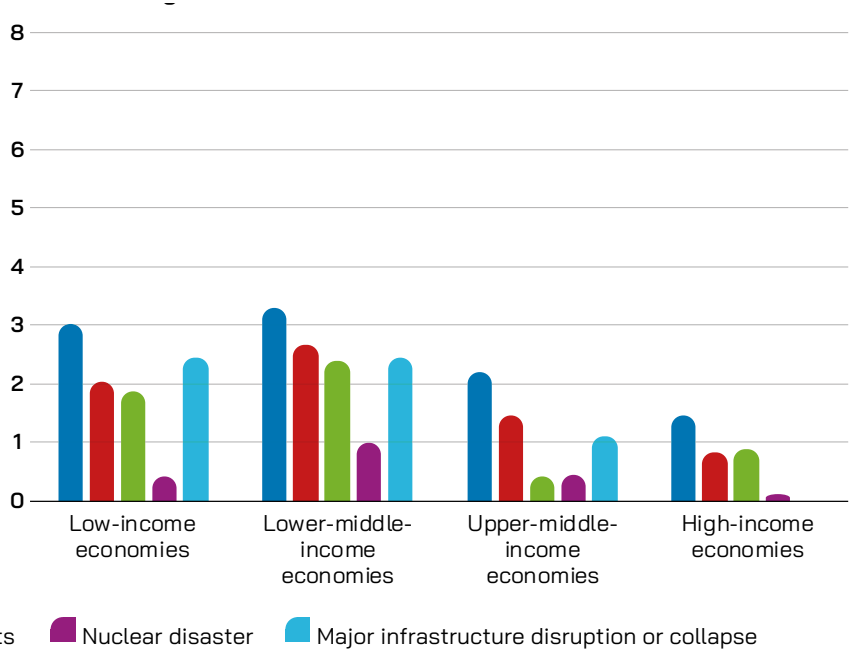
- Technological and industrial events are perceived with lower intensities as the level of income of the economies increases.
- Pollution, industrial accidents and infrastructure disruptions seem to drive this trend. Rules and regulation, and their enforcement, which increase with the level of income, could be an explanatory factor.
- The perceived intensity of these events drops below five for the higher-income economies.
- Nuclear and cybersecurity events stand out from this pattern.
- When it comes to weighted averages of intensity, they plummet for nuclear events due to both the limited spread of the nuclear power stations around the world and the rather drastic safety measures that surround them.
- More generally, the higher weighted average perceived intensity is recorded in the two lower-income categories, especially regarding pollution and infrastructure disruptions.
- However, the weighted averages are very low in high-income economies where rules and regulations are strong and enforced.

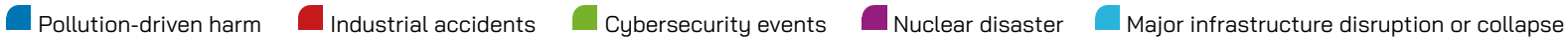
Figure 18. Average perceived intensity of technological events



Source: Author's own elaboration.

Figure 19. Weighted average perceived intensity of technological events



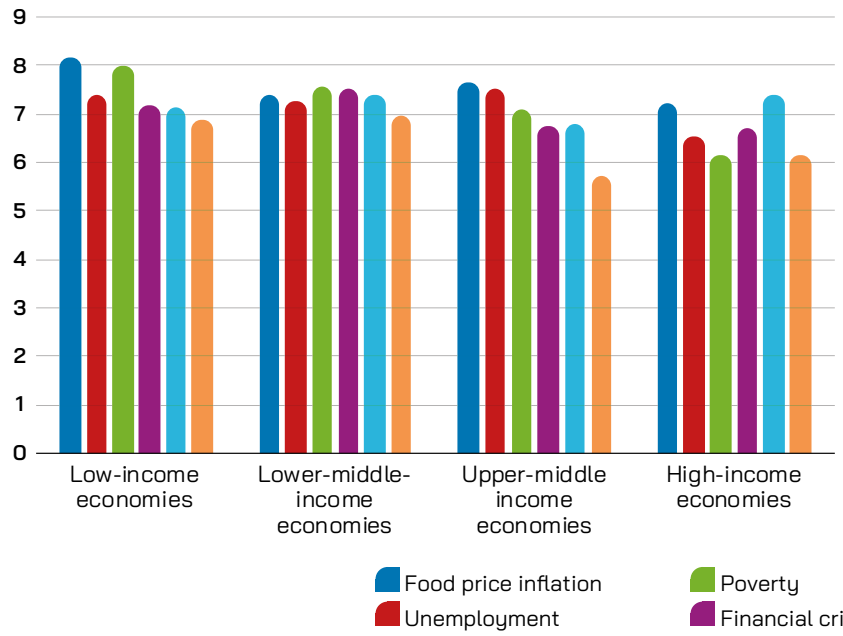


Source: Author's own elaboration.

Economic events

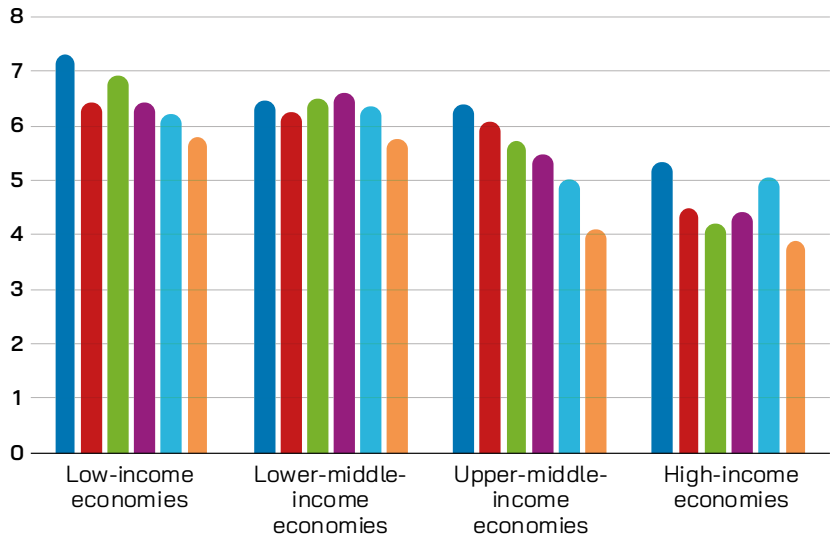
- What is striking in the category of economic events is that they are on average all perceived with a very strong intensity (around seven or above), irrespective of the level of income.
- Some of these events are long-term stresses (such as poverty or unemployment), while others are shocks with potential lasting consequences.
- As previously stated, economic shocks and stresses might either be first-hand shocks or the consequences of other shocks. It might be difficult for respondents to distinguish the two.
- It is not surprising that economic shocks are those perceived to have the highest intensity of all the seven shock categories.
- The weighted average shows a progressive decline as income level increases. However, they remain very similar in low and lower-middle-income economies.
- Food price inflation is confirmed as the most significant shock, irrespective of the level of income of the economies.

Figure 20. Average perceived intensity of economic events



Source: Author's own elaboration.

Figure 21. Weighted average perceived intensity of economic events

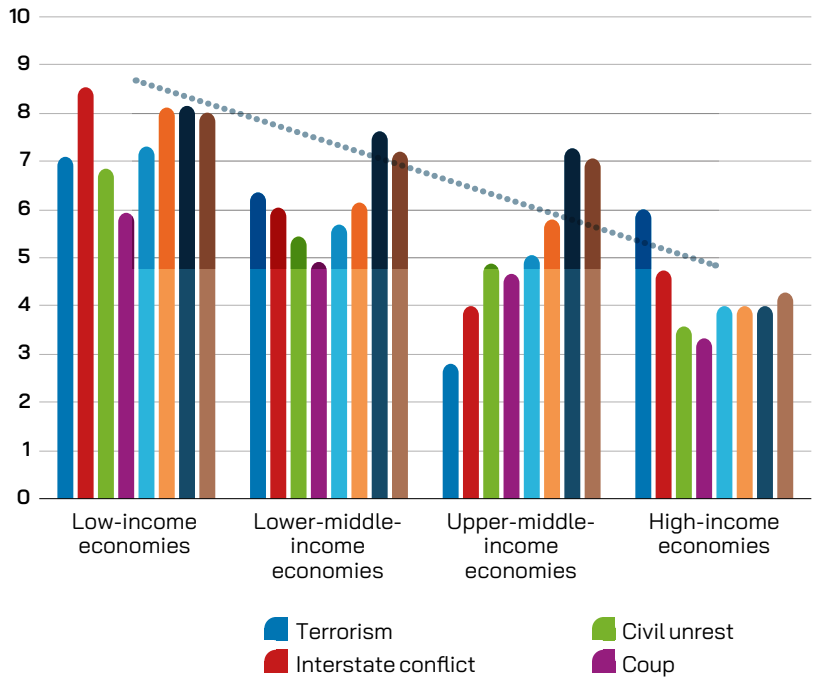


Source: Author's own elaboration.

Political and civic events

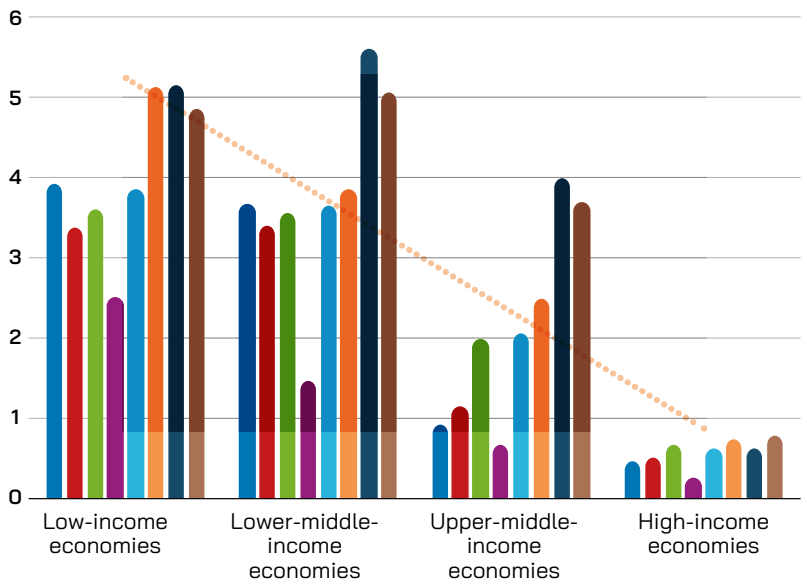
- Political and civic events are perceived with a relatively strong intensity, especially in low-income economies.
- Interstate conflicts are perceived as having the most significant impacts on food systems in low-income economies. Corruption and crime rates dominate in middle-income economies, and terrorism in high-income economies.
- While the average intensity of most events seems to decrease as the level of income increases, terrorism and interstate conflict do not seem to follow this pattern.
- The weighted averages show a very different pattern. In high-income economies, political and civic events are perceived as having intense impacts but have a low occurrence, with values below one irrespective of the nature of the event.
- In this category, the disparity between high-income and lower-income economies is the most pronounced among all categories of shocks and stresses, indicating that this is where the inequality of exposure is greatest.
- The ranking is also different, with migration and displacement, corruption and crime rate standing out as the most important shocks and stresses.

Figure 22. Average perceived intensity of political and civic events



Sources: Author's own elaboration.

Figure 23. Weighted average perceived intensity of political and civic events



Sources: Author's own elaboration.

WHAT ARE THE IMPACTS OF THOSE SHOCKS AND STRESSES ON DIFFERENT SEGMENTS OF THE CRFS?

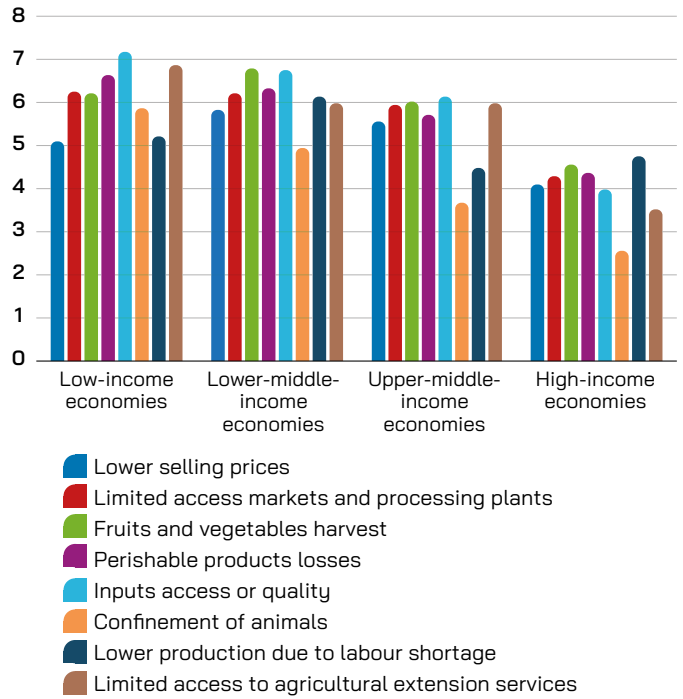
Methodological explanations

- This section deals with the perception respondents have of the intensity of the impacts of the shocks and stresses they identified as having recently affected their food systems. The question asked was the following: "What have been the impacts of these shocks and stresses on [a specific food system segment] in your city region?"
- The list of impacts were suggested following a literature review of publications on food systems in context of the COVID-19 pandemic. Food systems were divided into six segments:
  - food production, farming and input supply;
  - food manufacturing and processing;
  - food distribution and retail;
  - informal food sellers and street vendors;
  - food transportation and logistics; and
  - food consumption.
- Respondents were asked to rate the perceived intensity of the different impacts on each segments on a Likert scale from 1 to 10.
- The average intensity and the weighted average intensity (average intensity x the proportion of respondents mentioning the shock) of each impact as perceived by respondents are presented.

Impacts on food production, farming and input supply

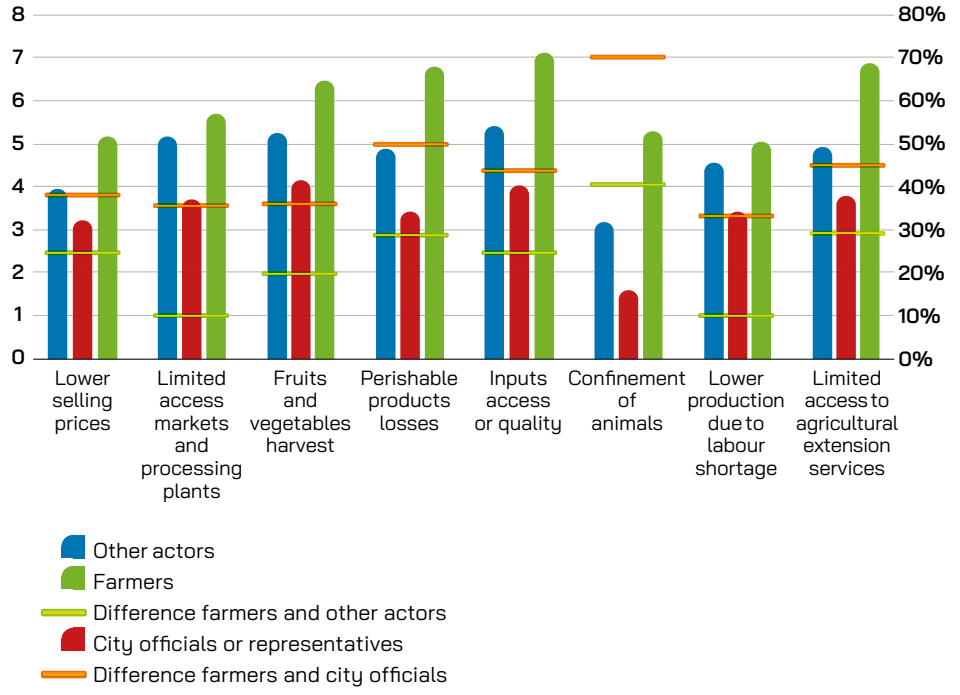
- According to the survey results, recent shocks and stresses seem to have affected high-income economies far less than low- and middle-income economies.
- The most significant impacts seem to vary between economies. Labour shortage clearly stand out as having the highest weighted average intensity in high-income economies.
- However, the intensity of labour shortages remains much lower than the intensity of limited access to inputs and extension services, production loss, limited access to markets and processing plants, and impacts on fresh produce harvest, in the three other economic categories.
- These five impacts rank in various orders depending on the income level of the economies, without any clear pattern.
- Three impacts might be highly positively correlated: production loss; limited access to markets and processing plants; and the impacts on fresh produce harvest.
- The perception of impacts on farming systems varies between farmers or farmer groups, city officials or representatives, and other actors of the food system: The differences of perception between farmers and city officials or representatives is always above 30 percent, with 50 percent for production loss, and even 80 percent for animal confinement. The difference of perception between farmers and city officials is double the one between farmers and the other actors of the CRFS. The bias previously identified is evident here too.

Figure 24. Weighted perceived average intensity of impacts on food production, farming and input supply



Source: Author's own elaboration.

Figure 25. Weighted average perceived intensity/actors



Source: Author's own elaboration.

Impacts on food manufacturing and processing

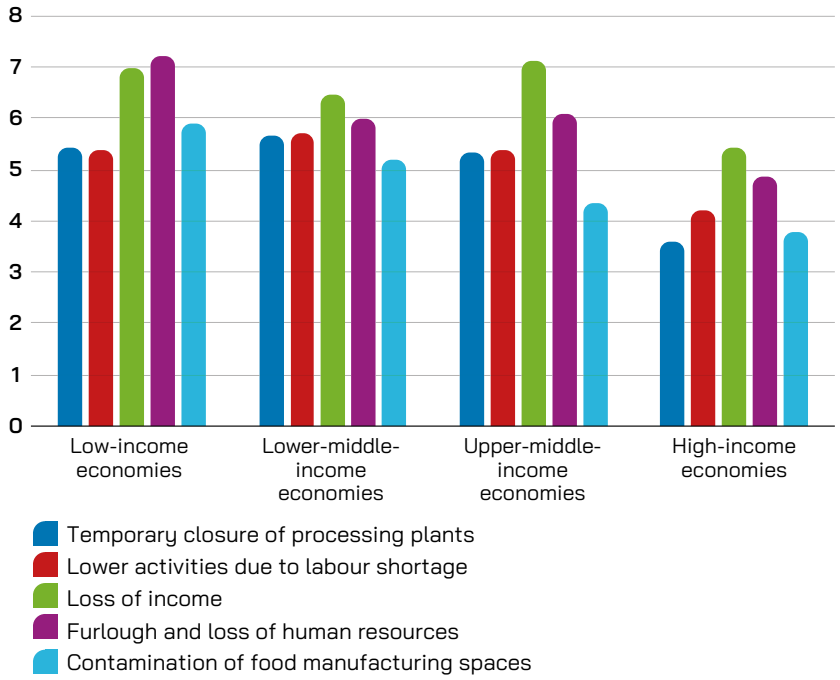
- The impact with the highest perceived intensity is clearly income loss.
- Income loss is the outcome of the other impacts with the loss of human resources issue at the centre.
- These results seem to confirm a causality chain in each income level economy:

Reduced activity or temporary closure ⇄ furlough or loss of human resources ⇄ income loss.

Impacts on food distribution and retail

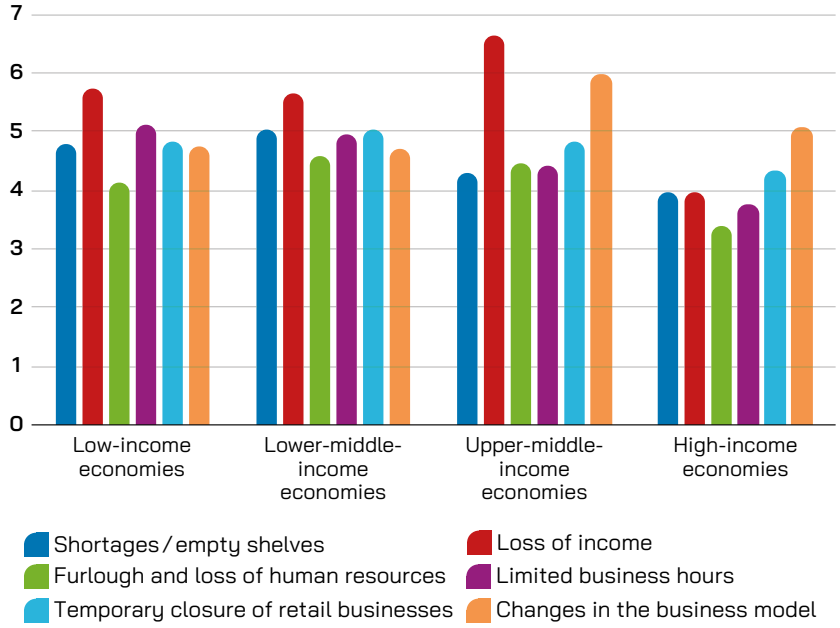
- Again, the impact with the highest perceived intensity is clearly income loss, except in high-income economies where changes in business model stand out. This might indicate a high level of adaptability to the shocks.
- The other impacts do no show much difference in perceived intensity.
- The intensity of income loss in distribution and retail is very similar to manufacturing and processing, oscillating between 5 and 6.5 depending on the level of income of the economies.

Figure 26. Weighted average perceived intensity of impacts on food manufacturing and processing



Source: Author's own elaboration.

Figure 27. Weighted average perceived intensity of impacts on food distribution and retail



Source: Author's own elaboration.

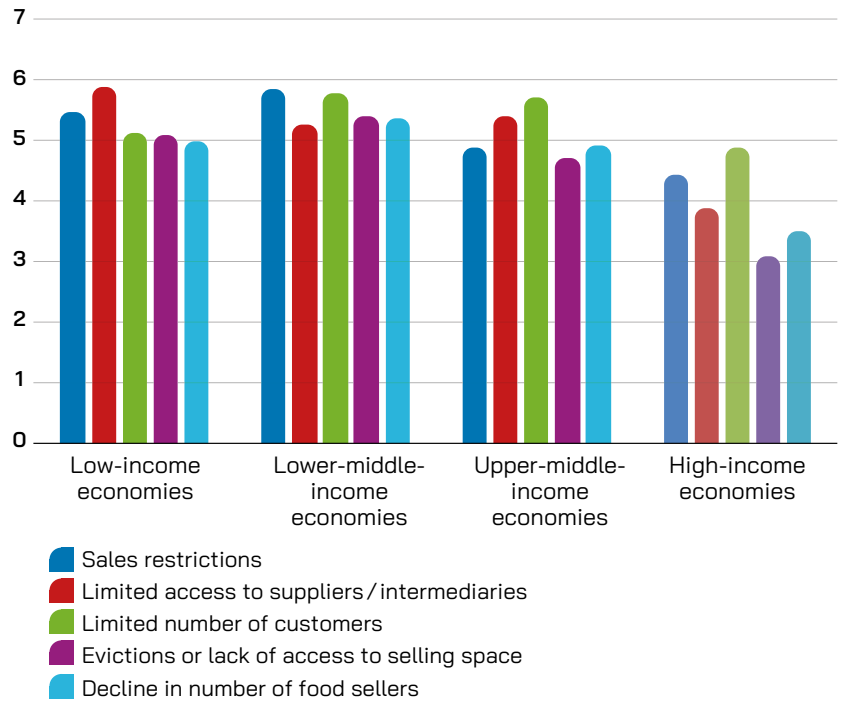
Impacts on informal food sellers and street vendors

- Food sellers and street vendors are perceived as being among the most affected intermediary actors by shocks and stresses, except in high-income economies, more so than processors, wholesalers and retailers.
- However, across all income levels, no single factor emerges as the most severe, highlighting the diverse challenges these actors face. The cumulative impact of these challenges likely contributes to the decline in the number of food sellers, a trend that should be confirmed by future research.

Impacts on food transportation and logistics

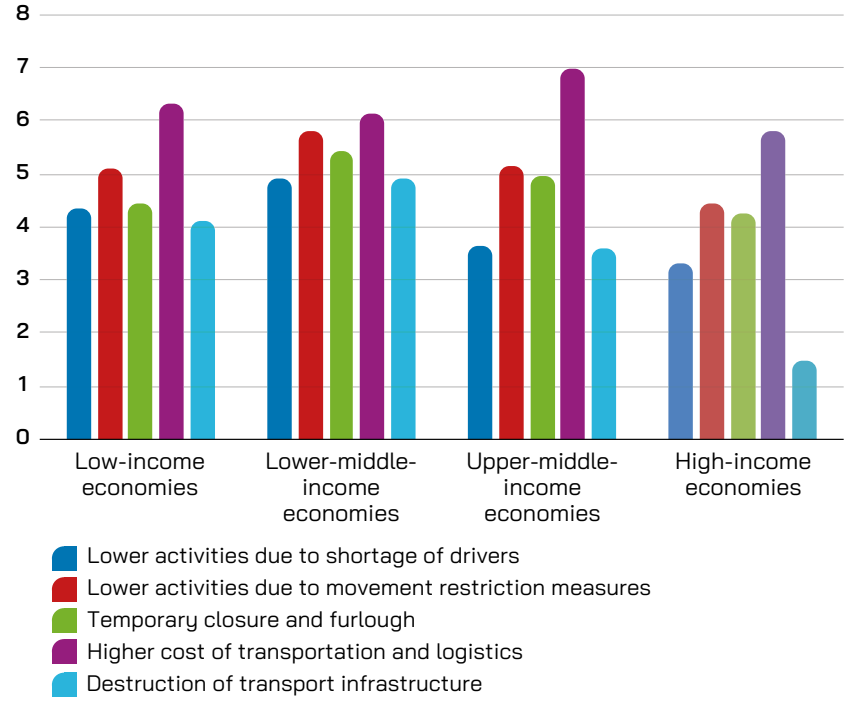
- The rise of transportation costs and logistics is clearly perceived as the most important impacts of recent shocks and stresses, whatever the level of income. The reduction of the level of activity comes second.
- The most important difference between income groups is the impacts of shocks on transport infrastructure which are perceived as particularly resilient in high-income economies.

Figure 28. Weighted average perceived intensity of the impacts on informal food sellers and street vendors



Sources: Author's own elaboration.

Figure 29. Weighted average perceived intensity of the impacts on food transport and logistics

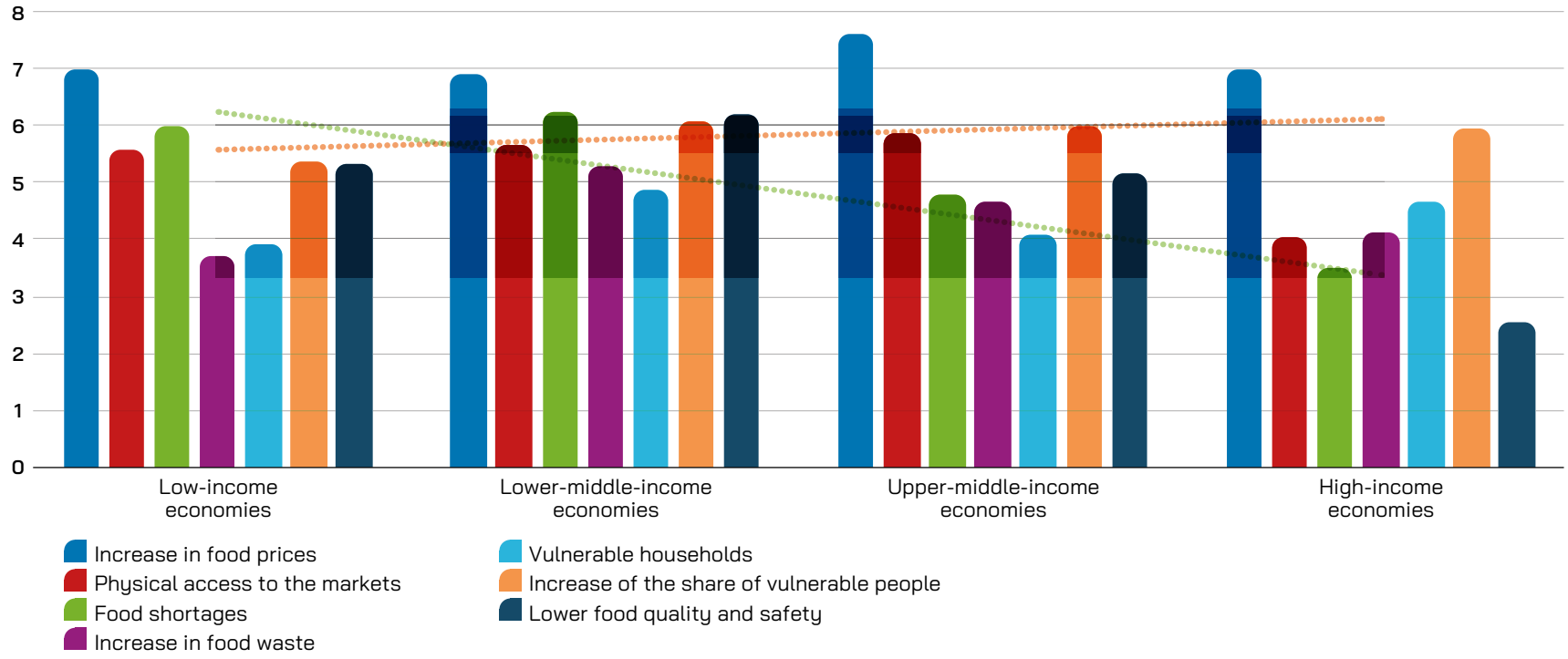


Source: Author's own elaboration.

Impacts on food consumption

- Food price increases are perceived as the most significant impact of shocks and stresses on consumers.
- The second most important impact varies according to the income level. In lower-income economies, food shortages rank second.
- The weighted average perceived intensity of the increase in the number of vulnerable people is consistently high across all income levels, making it the second most important impact in upper-middle and high-income economies.

Figure 30. Weighted average perceived intensity of impacts on food consumption



Source: Author's own elaboration.

WHAT ARE THE RESPONSES TO THESE SHOCKS AND STRESSES AND THEIR IMPACTS?

Methodological explanations

- This section deals with the perceptions CRFS actors have of their actions to cope with impacts of recent shocks and stresses. The question asked was the following: “What have been the individual responses of [food system actors] in your city region food system to the impacts of these shocks and stresses?” The responses were suggested following a literature review on the COVID-19 pandemic that allowed the identification of a series of actions. Respondents had the possibility to add further actions.
- Food system actors are divided into five categories: farmers; processors and manufacturers; distributors (wholesalers and retailers); informal sellers and street vendors; and consumers.
- This section only displays the weighted average intensity of the responses since the difference between the two measurements were very limited, and the comparison of the two did not provide any significant additional information.

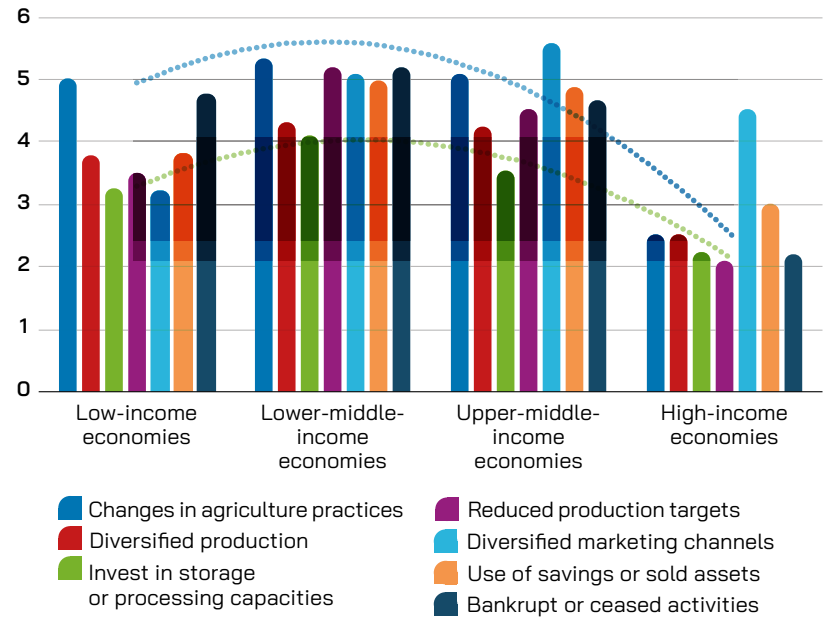
Responses from producers and input suppliers

- The responses from producers and input suppliers are clearly perceived as the most intense in lower- and upper-middle economies.
- In low-income economies, respondents perceived that coping strategies were primarily based on changes in practices at best and ceasing activities at worst.
- In high-income economies, changes in marketing channels are perceived as first-order response, followed by using savings and selling assets.
- In middle-income economies, responses are perceived as much more diverse, showing a mix of what dominates in low- and high-income economies.
- Investing in storage and processing capacities, while probably one of the most effective responses to deal with future shocks as supported in literature, remains the answer with the lowest perceived intensity in every income category.

Responses from processors and manufacturers

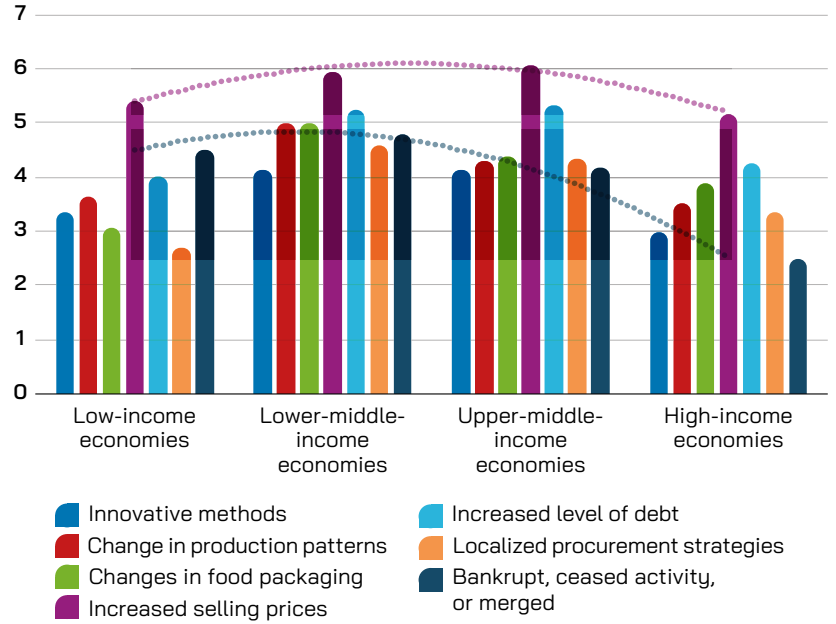
- The most significant response from processors and manufacturers, as perceived by respondents, is an increase in selling prices.
- The second most common response is ceasing operations or merging, except in high-income economies where this is perceived as the least frequent response. This difference may be tied to the structure of companies and the demand they meet.
- While local food procurement is often emphasized as key to enhancing CRFS resilience, it is seen as an important response in all but high-income economies.
- Innovation, such as offering new or alternative manufacturing and processing methods, is not widely perceived as a significant response.

Figure 31. Weighted average perceived intensity of responses (producers and input suppliers)



Source: Author's own elaboration.

Figure 32. Weighted average perceived intensity of responses (processors and manufacturers)



Source: Author's own elaboration.

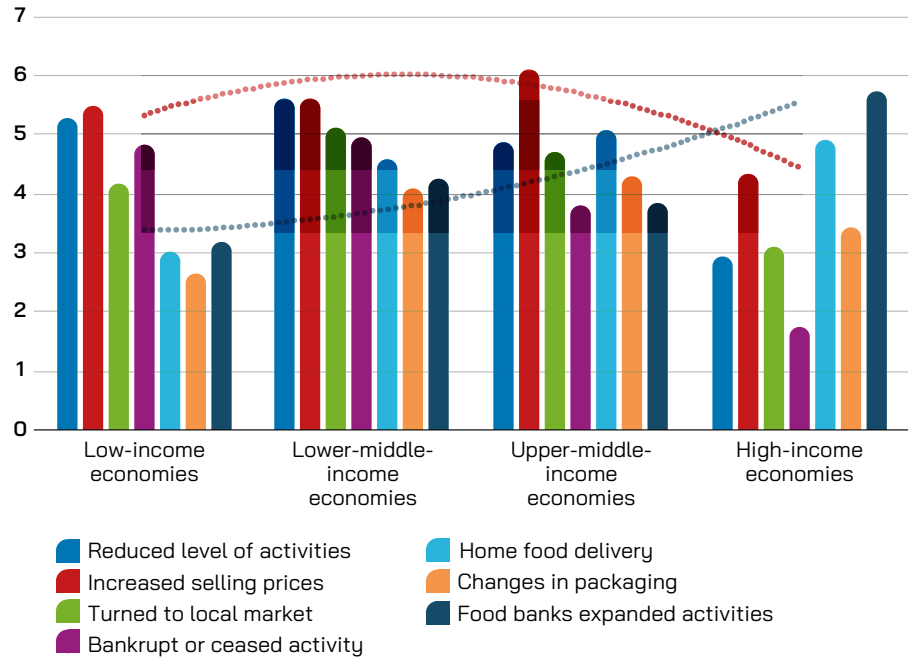
Responses from distributors (wholesale and retail)

- Similar to processors and manufacturers, wholesalers and retailers are perceived to respond primarily by raising prices, with a reduction in activity levels being the second most common response.
- In high-income economies, however, home food delivery is viewed as the most significant adaptation, surpassing even price increases.
- The expansion of food bank activities is seen as particularly crucial in high-income economies, much more so than in other income categories. Food banks are perceived as the primary response to the rising number of vulnerable people in these regions.

Responses of informal food sellers and street vendors

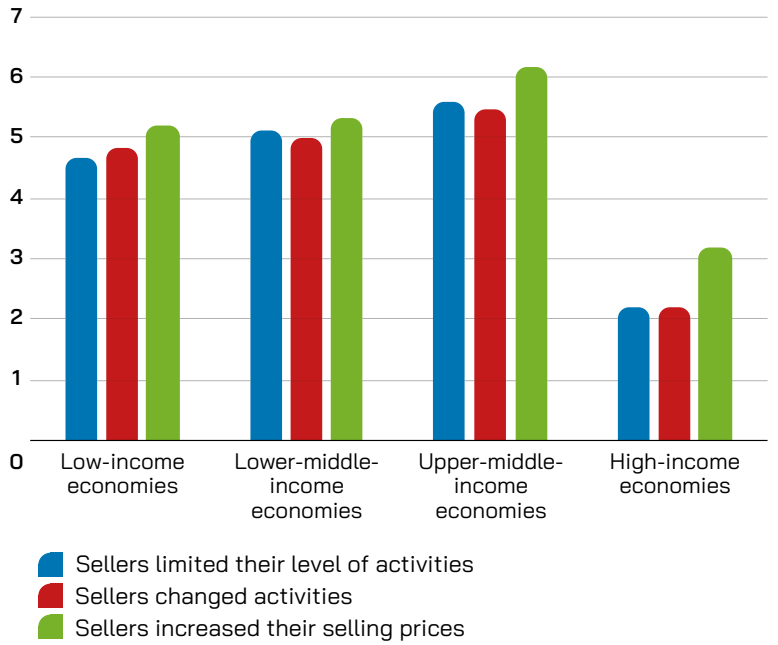
- An increase in selling prices is once again perceived as the primary response.
- However, the perceived responses of informal food sellers and street vendors show little variation, with all three suggested adaptation strategies being seen as used with similar intensity.
- A notable gap exists between high-income economies and others in terms of perceived intensity due to the weigthing, i.e. the lower proportion of respondents from high-income economies reporting on the responses of street vendors.

Figure 33. Weighted average perceived intensity of responses (distributors)



Sources: Author's own elaboration.

Figure 34. Weighted average perceived intensity of responses (informal food sellers and street vendors)

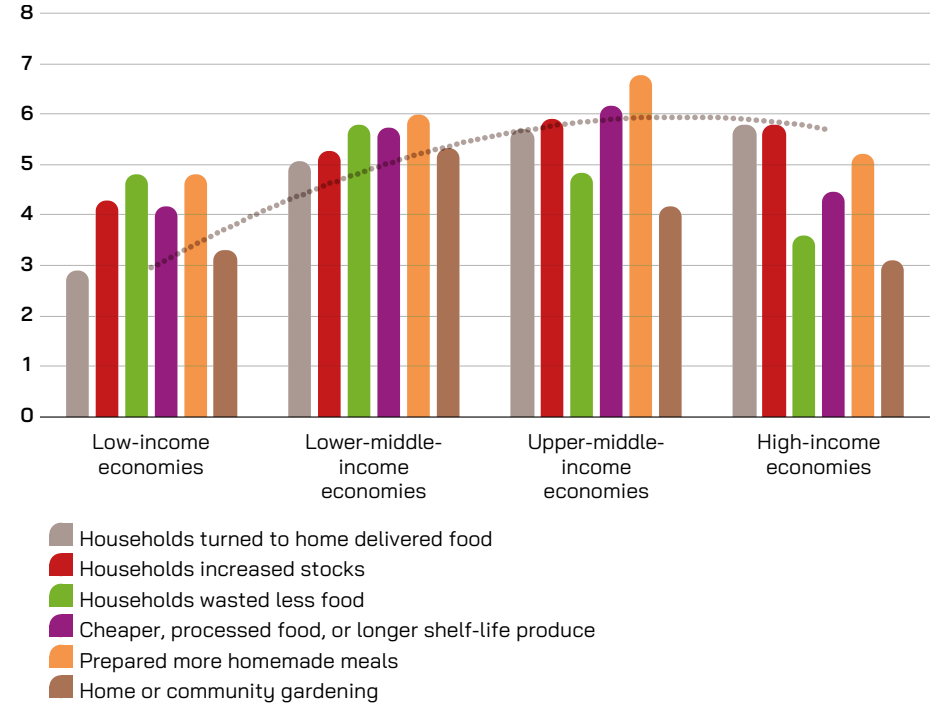


Source: Author's own elaboration.

Responses from consumers

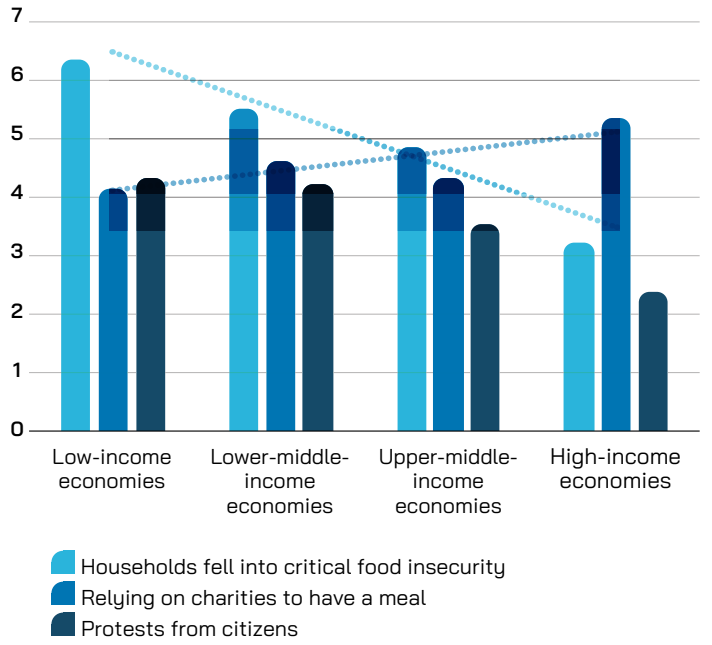
- The impact of the COVID-19 pandemic is evident, with households primarily perceived as responding by shifting toward home-cooked meals, home delivery, and stockpiling, with the intensity of these responses increasing with income levels.
- Other perceived responses do not exhibit a clear pattern.
- Home or community gardening, however, appears to be perceived as significant primarily in lower-middle-income economies.
- The most critical observation is the perceived difficulty households face in coping with shocks to their CRFS, with food insecurity being viewed as the primary consequence in low-income countries, decreasing as income levels rise.
- In line with the expansion of food banks, households are perceived as turning to charity, an increasing trend becoming more pronounced in higher-income countries.

Figure 35. Weighted average perceived intensity (consumers)



Source: Author's own elaboration.

Figure 36. Weighted average perceived intensity (consumers)



Source: Author's own elaboration.

WHAT ARE THE COLLECTIVE INITIATIVES OR PUBLIC POLICIES THAT HAVE BEEN DEVELOPED, AMENDED OR IMPLEMENTED?

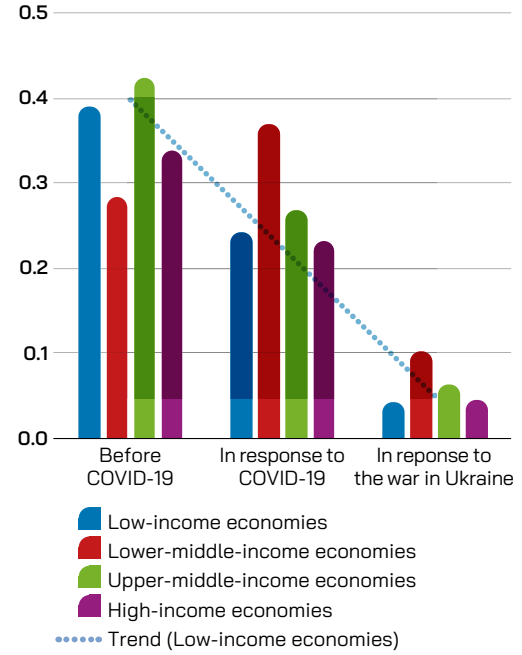
Methodological explanations

- While the previous section dealt with responses to shocks and stresses from individual actors, this section focuses on collective actions and public policy. The list of collective actions and public policies was drawn from a literature review of the COVID-19 pandemic. It included 29 types of policies clustered in seven categories.
- The question asked was the following: "what have been the collective initiatives or public policies developed, amended or implemented?" Respondents could choose between four closed answers: existed before the COVID-19 pandemic; implemented as a response to the COVID-19 pandemic; implemented as a response to the war in Ukraine; and I don't know.
- The 29 collective initiatives or public policies were then sorted according to their main objective, i.e. whether they aim at preventing and anticipating shocks and their impacts (11 policies or collective actions), absorbing impacts (6), or adapting and transforming food systems (12).

Public policies and collective actions

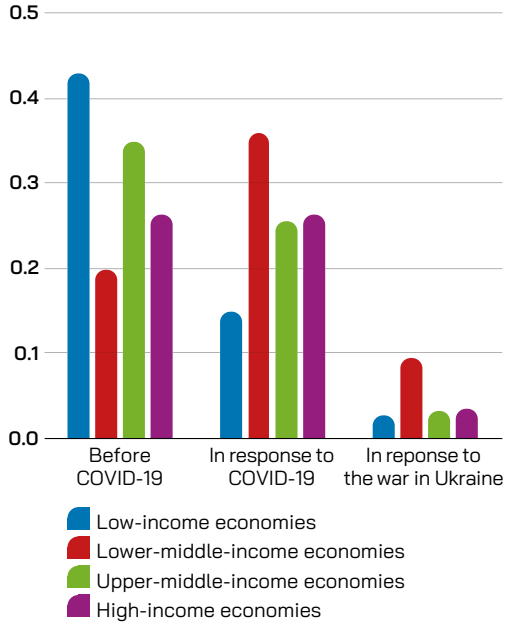
- The following graphs show the proportion of respondents who perceived each type of action as being implemented before the COVID-19 pandemic, in response to this crisis, or in response to the war in Ukraine.
- Whatever the type of collective actions of policies considered, many have been perceived as being already in place before the COVID-19 pandemic in all income categories except lower-middle-income countries.
- CRFS in low-income economies are perceived as having developed the highest level of collective actions and public policies prior to the COVID-19 pandemic. This aligns with the higher number of shocks and stresses that actors in these economies have perceived over the past five years compared to other income levels.
- In high-income economies, contrary to the others, the COVID-19 pandemic triggered mostly absorptive measures, as perceived by CRFS actors, with fewer adaptive and transformative initiatives compared to other economies.
- The war in Ukraine does not seem to induce many public policies and collective actions. This might be due to the time of the survey (too early for actors to perceive changes).
- It must be noted that the survey focused on the type of initiatives rather than their effectiveness, so it would be unwise to draw any conclusion in this respect.

Figure 37. Preventive and anticipative actions



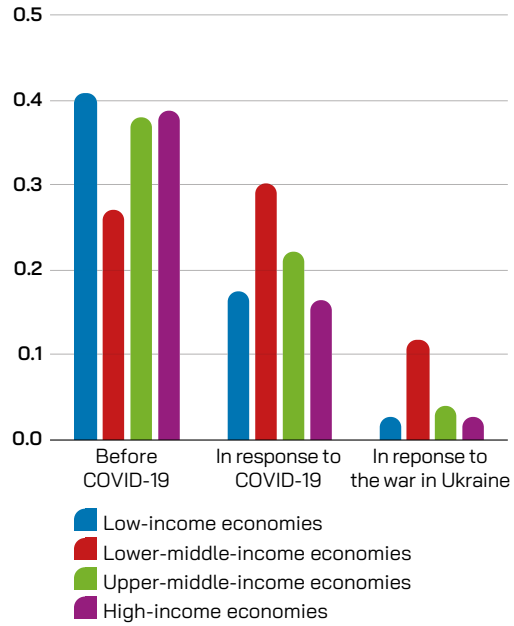
Source: Author's own elaboration.

Figure 38. Absorptive actions



Source: Author's own elaboration.

Figure 39. Adaptive and transformative actions



Source: Author's own elaboration.

WHAT ARE THE MOST IMPORTANT CHARACTERISTICS OF CRFS?

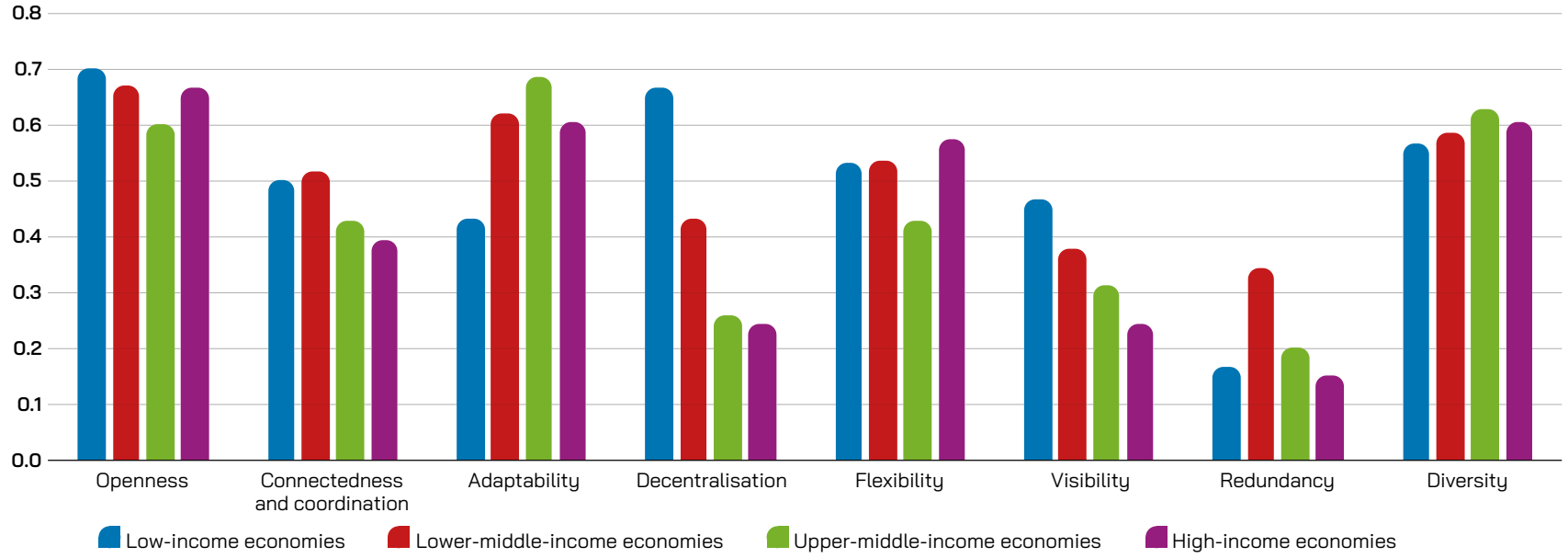
Methodological explanations

- Based on a literature review, several features of CRFS have been identified as potentially critical in supporting the resilience of food systems: openness; connectedness and coordination; adaptability; decentralization; flexibility; visibility; redundancy; and diversity.
- The question was: "What are the most important characteristics of your city region food system that enabled these collective actions and public policies to be put in place?" The possible answers were yes/no.
- The proportion of respondents answering yes to each feature was then used in the analysis to highlight the perceived role of the different features in supporting CRFS resilience.

Characteristics of CRFS

- Two key features are widely perceived as important across all CRFS, regardless of income level: openness and diversity. Openness refers to the ability of the food system to maintain sufficient spatial connections with other food systems, allowing for alternative food flows. Diversity pertains to the variety of actors in terms of size and function, leaving space for reorganization and increasing flexibility. This diversity is also recognized as the most important feature in the reviewed literature.
- Flexibility (the capacity to diversify value chains to maintain business continuity) complements diversity as an important characteristic.
- Adaptability, which involves the awareness and capacity of food system actors to quickly and effectively respond to changes, is generally perceived as an existing characteristic, except in low-income economies where individual capacities may be limited.
- More surprising at first sight, but consistent with the previous feature, is that decentralization (local innovative food system actions are fostered to avoid problems caused by maladapted, top-down, centralized approaches) is perceived as particularly important in low-income countries. In these contexts, CRFS actors often make do with their local, limited capacities, with low expectations from higher levels of government.
- Connectedness and coordination—where a governance mechanism exists to identify, involve, and coordinate local food system actors—are perceived as much less prominent than one might expect, despite the importance of governing food systems in the face of crisis and unsustainability. This is especially true in higher-income economies, where food systems are typically more integrated and regulated at the national level, and local governance appears as a new dynamic. This is consistent with the observation that decentralization is rarely an existing feature.

Figure 40. Average perception of CRFS characteristics



Source: Author's own elaboration.

WHAT GOVERNANCE PRINCIPLES HAVE UNDERPINNED RESPONSES TO SHOCKS AND STRESSES?

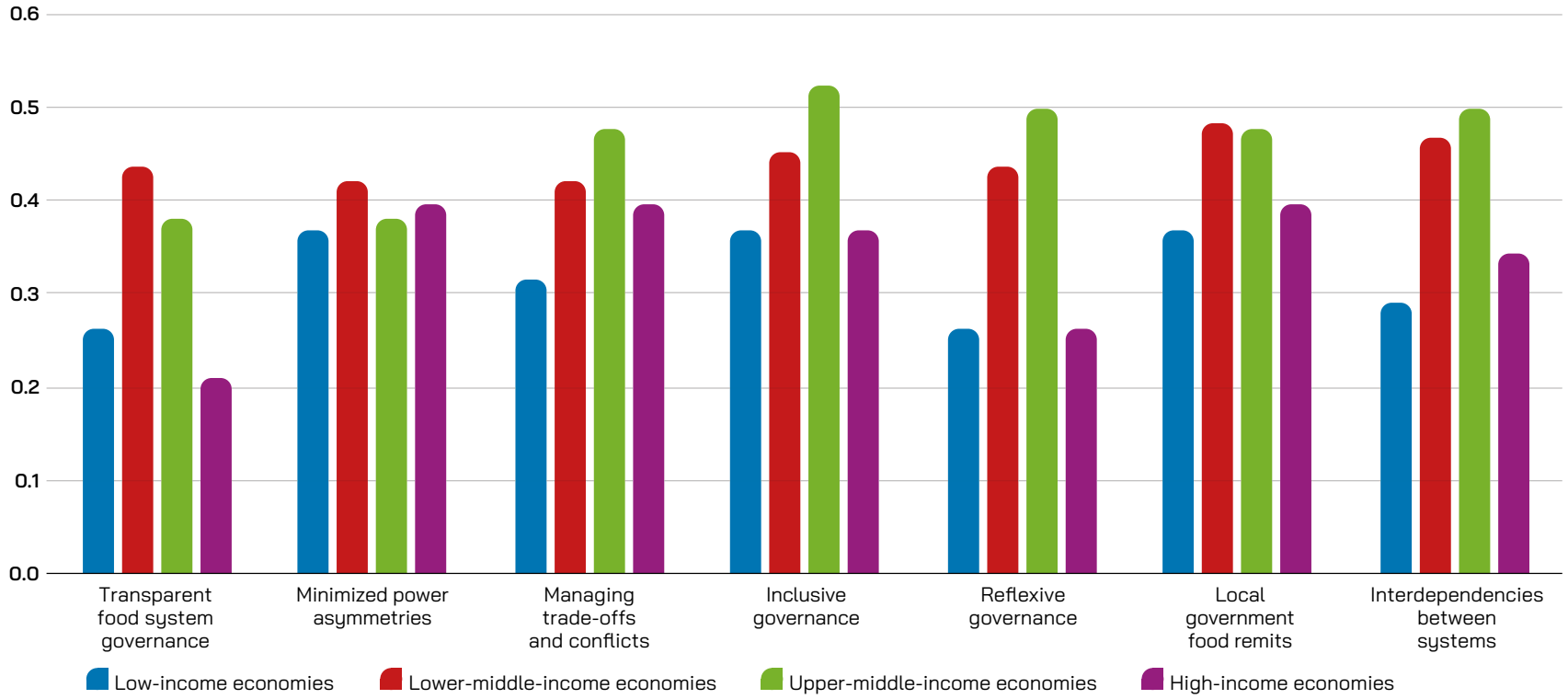
Methodological explanations

- The way a CRFS is governed heavily conditions its ability to respond to shocks and stresses, and beyond, its transformation. To assess the perception of CRFS actors on the governance of their food systems, a set of principles was identified. These principles aim to clarify how the coordination and connectedness feature, highlighted in the previous question, manifests at the local level.
- Respondents expressed their perception of how each principle was considered or implemented locally with four possible answers: never considered; considered but never implemented; existed before recent shocks and stresses; has improved following recent shocks and stresses.
- For each of these four possible responses, the proportion of respondents is presented for each principle.

Governance principles

- Many principles are perceived as never considered or considered but never implemented, since for many of them, the proportion of respondents is around 40 percent or above.
- A few exceptions exist, mostly in low-income and high-income economies when it comes to transparency of food system governance, reflexive governance and the acknowledgment of interdependences between systems.
- Minimizing power asymmetries within the CRFS and inclusive governance (both probably going hand-in-hand) are among the less considered or implemented principles.
- Considering food as an integral remit of local government is also perceived as challenging.

Figure 41. Never considered + considered but never implemented

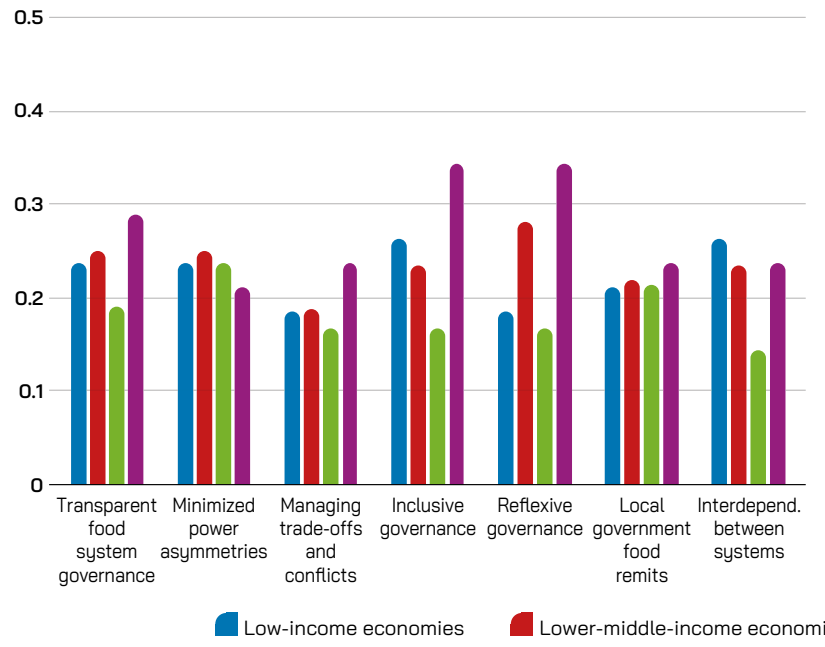


Source: Author's own elaboration.

Governance principles

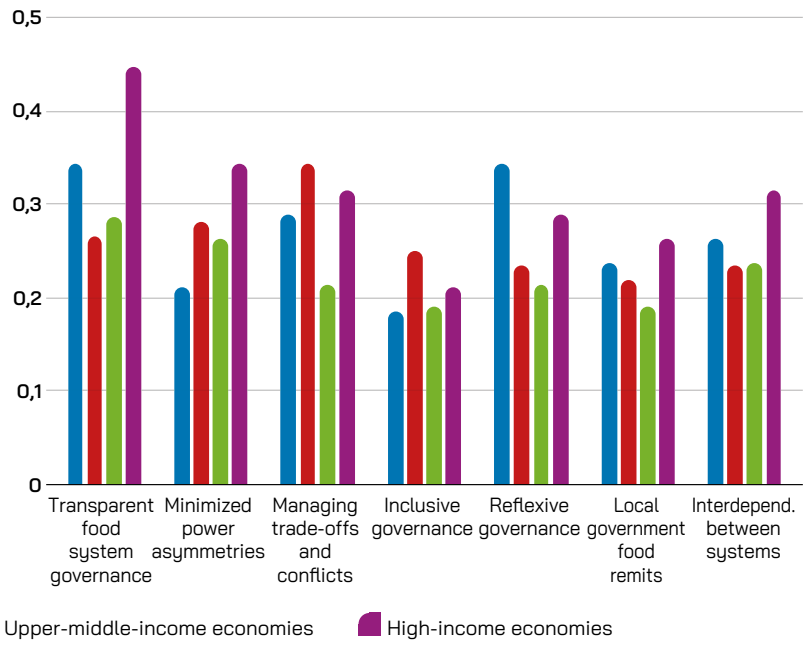
- Governance principles are perceived as being poorly implemented before recent shocks and stresses. Apart from a few exceptions, most principles were perceived as existing by only 25 percent or below of respondents.
- Upper-middle-income economies are where respondents perceived governance principles to have been least implemented.
- When they existed before recent shocks, governance principles were perceived as being prioritized differently depending on the level of income. Transparent, inclusive and reflexive governance principles clearly dominate in high-income economies according to respondents' perception. In the other income categories, the difference between principles is much more limited.
- Recent shocks are perceived as having stimulated the implementation of some governance principles, especially in high-income economies, but on a limited scale (between 20 and 30 percent on average).
- Moving towards a more transparent food system governance is perceived as one of the most improved principles in all income categories.
- Beyond transparency, no other principle really stands out.

Figure 42. Existed before recent shocks and stresses



Source: Author's own elaboration.

Figure 43. Has improved following recent shocks and stresses



Source: Author's own elaboration.

OVERALL, WHAT HAVE BEEN THE IMPACTS OF THE COLLECTIVE ACTIONS AND PUBLIC POLICIES MENTIONED?

Methodological explanations

- The last survey question was about the overall perceived consequences of the many changes in the CRFS, i.e. whether, the CRFS has made progress towards sustainability, the ultimate objective.
- The question was: "Overall, what have been the impacts of the collective actions and public policies mentioned in the previous question?". There were four possible non-exclusive options with a yes/no/I don't know answer:

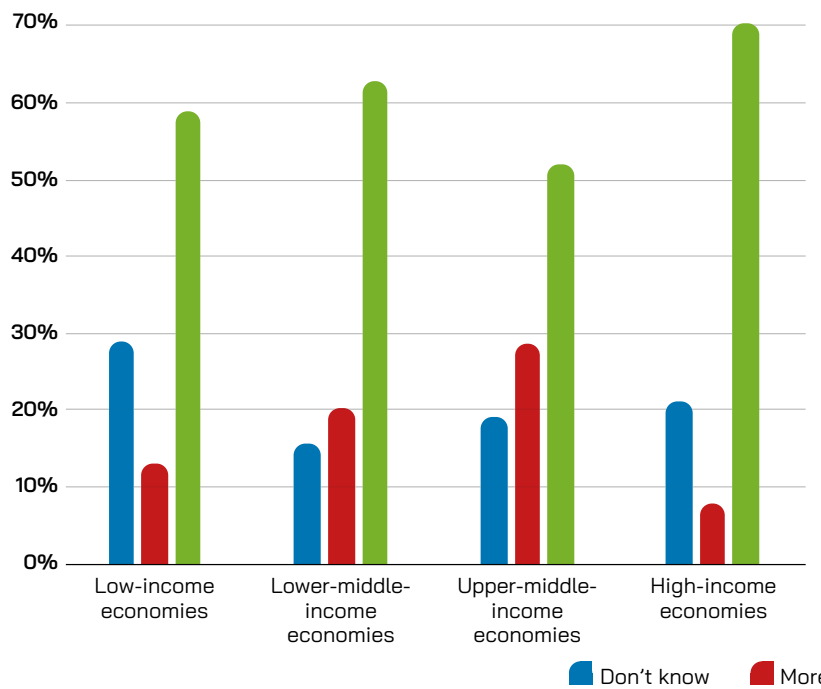
  1. our food system has rebounded to its pre-shock or stress functioning;
  2. permanent changes of practices have taken place within the food system;
  3. the food system is more resilient to further shocks and stresses; and
  4. the food system is more economically, environmentally, and socially sustainable.

- The answers were grouped according to the following: a yes to answer 1 equates back to business as usual; a yes to answers 2 and/or 3 means the CRFS encountered sustainable changes; and all other combinations refer to unsustainable changes.
- The results are then showed according to the income level of economies and the type of respondents.

Overall consequences on CRFS

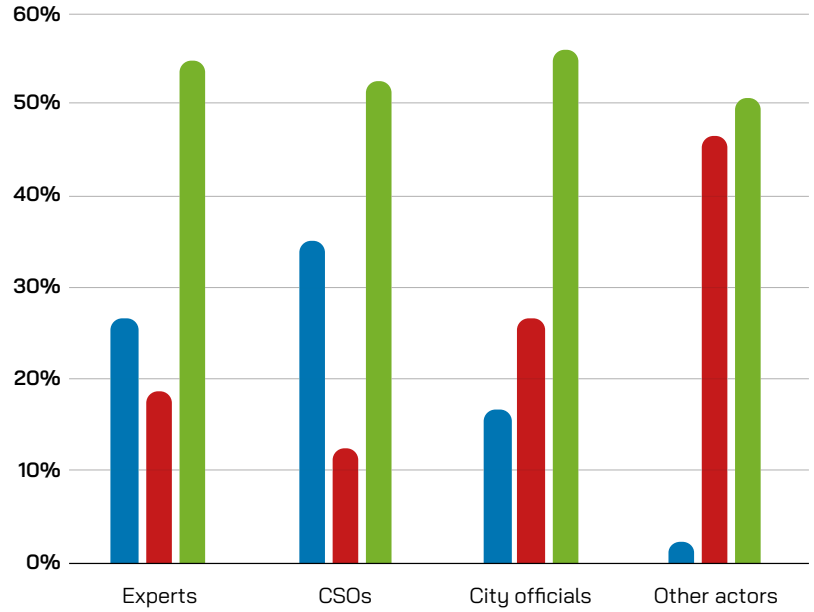
- While changes are perceived to have happened over the past few years, sometimes because of recent shocks and stresses, their overall consequences are clearly not satisfactory: less than 10 percent of respondents in high-income countries perceived their CRFS to be more sustainable, with a maximum of almost 30 percent in upper-middle- income economies.
- What is more worrying is that respondents perceived that the changes are not improving the sustainability of their CRFS: 70 percent in high-income economies, low- and lower-middle-income economies, and just under 50 percent in upper-middle-income economies.
- Among the different groups of respondents, experts, academics, and CSO representatives appear more cautious about the outcomes of recent changes, with only 19 percent and 13 percent respectively perceiving their food systems as more sustainable. City officials and representatives are slightly more optimistic, with 27 percent expressing a positive outlook.
- Other food system actors present a more balanced perspective, with 47 percent leaning towards improvements. However, the survey does not explain the reasons behind these differences in perception among the various groups. This discrepancy raises questions about what 'sustainability' means to different categories of actors. One hypothesis could be that these food system actors perceive their specific roles or activities within the food system as more sustainable, which does not necessarily entail that the CRFS is more sustainable overall. Further research would be needed to clarify this.

Figure 44. Sustainability of CRFS by income level



Source: Author's own elaboration.

Figure 45. Sustainability of CRFS by actor categories



Source: Author's own elaboration.

CONCLUSION AND WAY FORWARD

This survey offers a wealth of insights into the perceptions of CRFS actors, addressing critical issues related to shocks and stresses, their impacts, and the capacities—both individual and collective—to respond to these challenges. It examines the consequences of these responses and the perceived outcomes for CRFS. However, given the limited number of respondents and the imbalance in geographic representation and respondent types, the findings should be viewed more as hypotheses for future exploration rather than definitive evidence. The survey had a higher number of respondents from sub-Saharan Africa, which could reflect either effective outreach to the continent, high interest in this region, or a heightened urgency for action in a region facing significant challenges. Additionally, most respondents were academics, food system experts, CSO representatives, or city officials, indicating a difficulty in reaching other food system actors and getting them to participate in such surveys. Several key findings emerge:

- CRFS actors in poorer countries perceive a much higher number of shocks. This could be due to either the sheer number of shocks or the intensity of these shocks (inability of actors to adapt individually to these shocks).
- Not surprisingly, the COVID-19 pandemic has a strong influence on the respondents, whatever the level of income, showing the same very high level of unpreparedness. In addition to COVID-19, other significant shocks were noted, particularly climate-related ones like floods and heavy rainfall, except in high-income economies where heat events were more prominent. Economic events are also critical either as primary shocks or spill-over effects of other shocks. Food inflation is one of the most important economic events. Finally, political and civic events are particularly important in low-income economies, where interstate conflicts were highlighted as particularly intense.
- The impacts of these shocks are clearly perceived as the most important at the two hands of the food systems: the farmers and the consumers. Famers are likely to suffer a very wide variety of impacts thereby highlighting the immense needs for resilience on the production side, while for consumers, food price increase is clearly seen as the most important impact. In between, for the other actors, income loss, the last impact of any shock on CRFS economic actors, dominates most of the time, whatever the income level.
- There are notable differences in perception of shocks and their impacts between actors. City officials in lower-income economies seem to perceive fewer significant shocks than other actors. This finding needs to be further investigated, since it could challenge the role of local governments in supporting resilience of their CRFS. Similarly, city officials seem to perceive the impacts on farming systems as much lower than farmers, experts, and CSO representatives do.
- The perceived responses of food system actors to these shocks are very much consistent with their impacts: In response to income loss, processors, wholesalers, and retailers are seen as having raised prices, which may explain the increase in food prices for consumers. Farmers in high-income economies are perceived to have used their savings and sold assets to cope with shocks, while in low-income economies, changes in agricultural practices were seen as the most important response. Consumers are perceived to have employed a range of strategies, from stockpiling and preparing home-cooked meals when possible to resorting to food banks, before falling into food insecurity.

Conclusion and way forward

- Two striking findings should be highlighted regarding the responses of CRFS actors. First, investing in storage and processing capacities, often cited in the literature as one of the most effective strategies for managing future shocks, is perceived as the least utilized response across all income categories. Secondly, innovation—specifically enterprises offering new, alternative manufacturing and processing methods—is also seen as a relatively unimportant response from processors and manufacturers.

- Public policies and collective actions were perceived as being more important, and therefore consistent with the perceived increased number of significant shocks, particularly as income levels decrease. This suggests that shocks are viewed as opportunities to implement these types of actions, with many already in place before recent shocks and additional measures being adopted in response to the COVID-19 pandemic.

- When it comes to the characteristics of CRFS that facilitate the development of collective actions and public policies, respondents highlighted openness (sufficient spatial connection with other food systems enabling alternative food flows), diversity (of actors in size function, leaving space for reorganization) and flexibility (capacity to diversify value chains to ensure the continuity of business). Connectedness and coordination (a governance mechanism exists within the food system to identify, involve and coordinate local food system actors) are less perceived as a critical feature by CFRS actors, despite the central role governance plays in building resilience and sustainability.

- This is confirmed when asking actors about changes in governance principles. Only between 20 percent and 30 percent of respondents perceived that governance principles existed before the COVID-19 pandemic. Transparent, inclusive and reflexive governance principles clearly dominate in high-income economies according to respondents' perception. In the other income categories, the difference between principles is much more limited. The pandemic played an important part in supporting the implementation of these principles since between 20 percent and 30 percent of respondents perceived improvements in their implementation. However, a concerning 40 percent or more of respondents felt that many of these governance principles were still not considered or implemented, highlighting the need for greater efforts to enhance food system governance.

- From this survey, it appears that shocks and stresses affecting food systems are likely more frequent than often perceived, which make the difference between a shock (with objective impacts) and a crisis (where the subjective dimension comes into play to trigger collective awareness). Some actors perceived shocks, impacts and responses differently in this respect; while numerous shocks and stresses are sometimes windows of opportunity for systemic changes as perceived by CRFS actors here. However, the overall consequences are not always feeding a sustainability transition. Indeed, less than 10 percent of respondents in high-income countries perceived their CRFS to be more sustainable, with a maximum of just under 30 percent in middle-income economies.

Although these survey results should be interpreted with caution, they point to the need for deeper analysis to truly understand the current dynamics within CRFS. To address this, the survey has been followed by 11 in-depth case studies of city regions, offering additional insights into the resilience of CRFS (https://www.fao.org/in-action/food-for-cities-programme/resilience-study/en/).

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