THE FOOD SYSTEMS
COUNTDOWN REPORT

2024 | TRACKING PROGRESS AND MANAGING INTERACTIONS

gain
Global Alliance for
Improved Nutrition

Food and Agriculture
Organization of the
United Nations

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COLUMBIA CLIMATE SCHOOL
Climate, Earth, and Society

Recommended citation

Acknowledgments

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Executive summary

Food systems are facing immense challenges. Malnutrition is widespread, many food-related jobs offer low wages and poor working conditions, and the environmental burden of food production threatens planetary health. A realignment of food systems is urgently needed to improve their contributions to social and environmental goals. The Food Systems Countdown Initiative is a global interdisciplinary scientific collaboration that aims to track the progress of this transformation by regularly providing updated data on 50 food system indicators and producing thematic analyses related to key food system topics.

The 2024 Countdown report analyzes changes in indicator values since 2000, showing the direction and pace of travel towards or away from desired outcomes. The results of the analysis offer reasons for optimism: of the 42 indicators with time trends examined, 20 have changed in a desirable direction, on average, globally. These positive trends include indicators in all five Countdown themes—diets, nutrition, and health; environment, natural resources, and production; livelihoods, poverty, and equity; resilience; and governance. For example, access to safe water—essential for food security and for keeping food safe—has increased significantly across all regions, and on average most regions' production systems have become more efficient at using nitrogen, meaning less is wasted as run-off that pollutes the environment. However, some indicators (7 of 42) have significantly worsened globally over this period. For example, food price volatility has increased, suggesting less stable prices amid food system shocks, and government accountability has decreased, indicating that governance may not be rising to the challenge of supporting food systems transformation. For 15 indicators, there has been no significant change despite the need for steady progress to meet key global goals.

The report also examines the interactions within and across the 50 Countdown indicators. Interactions are critical because change (or lack thereof) in one indicator can cause (or block) changes in others, complicating decision-making and giving rise to trade-offs between goals as well as unintended consequences of actions. Drawing on the expertise of the Countdown members, the report finds that most indicators have theoretical interactions with other indicators. Some of these are direct while others are indirect, operating via intervening indicators. Case studies with stakeholders in Ethiopia, Mexico, and the Netherlands, focused on the governance indicators, verified that many of these interactions are relevant at the national level as well as globally.

Governance and resilience indicators show the largest number of connections to other themes, reflecting their cross-cutting importance for food system outcomes. Given that changes in these areas can affect many other indicators, policymakers should prioritize actions to shift them in

desirable directions. Other indicators, such as diet quality and food price volatility, have many contributing factors; for these indicators, achieving change requires substantial coordinated action across sectors and actors. These indicators should be a key focus of efforts to improve policy coherence.

The 2024 Countdown report shows that progress toward food systems transformation is occurring. Policymakers must reinforce this progress where it has occurred and refocus energy where it has not—while remaining aware that each element of the food system interacts with other elements. Progress requires a holistic approach that leverages these interconnections to drive transformative change.

Introduction

Food systems[1] play a major role in our society and have a large impact on our planet: They employ more than a billion people and support human health for the whole population of 8 billion. Well over half of birds and mammals on Earth are being raised for food. And most of the planet's fresh water and nearly half of its habitable land are used for agriculture.[2],[3] We could not live without food systems, which provide food, support local ecosystems, and enable livelihoods—and since they are connected to all 17 Sustainable Development Goals (SDGs), we cannot improve quality of life without leveraging them.

Yet food systems both create and face challenges. These include challenges for humanity, such as the lack of access to safe, nutritious, and affordable diets for much of the population and the poor-quality jobs faced by many agricultural and other food-system workers. They also include challenges for the planet, such as the significant share of greenhouse gas emissions that come from food systems and that go on to drive the climate changes that threaten those very systems.

To leverage these benefits and mitigate these challenges, food systems urgently need transformation on multiple fronts, including human health, livelihoods, and environmental sustainability. Momentum behind this transformation has built considerably in recent years, such as through the 2021 United Nations Food Systems Summit (UNFSS) and the past two UN Climate Change Conferences of the Parties, where more attention was paid to food systems than in any prior climate negotiations. Efforts are now starting to shift from recognizing the need for transformation to figuring out *how* to bring it about. Rigorous monitoring is essential to track progress along that path. The Food Systems Countdown Initiative ("The Countdown"), described in Box 1, is a global interdisciplinary scientific collaboration that aims to meet this need as we jointly count down to the 2030 deadline to achieve the SDGs.

The Countdown's baseline report,[4] published in December 2023, set out a framework for holistically monitoring food systems that encompassed five themes. It then presented 50 indicators that could be monitored to track progress on all five themes, shown in Table 1, and reported on their starting points. That report made clear that there are major differences in starting positions for many indicators across countries and regions, with no country, income group, or region performing desirably on all fronts. This diversity confirmed that there are significant opportunities both for achieving transformative change and for learning across countries about the best ways to do so.

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1. The term "food systems" is used in line with the United Nations Food Systems Summit language. However, the FSCI indicator framework considers broader agrifood systems encompassing activities and processes related to non-food agricultural products (e.g., forestry, fibres, biofuels, etc.) that are interconnected with food for human consumption. Many indicators cannot distinguish food and non-food components of production and value addition and non-food components greatly influence the environment, social outcomes, and the food people ultimately eat.
2. OurWorldinData.org. Retrieved from: 'https://ourworldindata.org/' [Online Resource].
3. B. Davis et al., *Estimating global and country-level employment in agrifood systems*, FAO Statistics Working Paper Series 23-34 (Rome: Food and Agriculture Organization of the United Nations [FAO], 2023), http://www.fao.org/documents/card/en/c/cc4337en, doi:10.4060/cc4337en.
4. Food Systems Countdown Initiative, *The food systems countdown report 2023: The state of food systems worldwide* (New York: Columbia University; Ithaca: Cornell University; Rome: FAO; Geneva: Global Alliance for Improved Nutrition [GAIN], 2023), https://doi.org/10.36072/fsci2023.

Table 1. The Countdown indicators

● Trending in desirable direction ● Trending in undesirable direction ● No change

Diets, nutrition, and health

↗ **Access to safe water:** Share of the population that gets drinking water from an improved source, providing the clean water essential for food security (SDG 6.1.1)

Consumption of all five food groups: Share of the adult population consuming all five food groups typically recommended for daily consumption

Population who cannot afford a healthy diet: Share of the population whose food budget is less than the cost of a healthy diet

↗ **Cost of a healthy diet:** Per-person cost of the least expensive locally available foods to meet daily needs, based on food-based dietary guidelines

↗ **Population experiencing moderate or severe food insecurity:** Share of the population experiencing food insecurity, measured according to the Food Insecurity Experience Scale (FIES) (SDG 2.1.2)

↗ **Availability of fruits and vegetables:** Amounts of fruits and vegetables—an underconsumed yet highly nutritious food group—available in a country's food supply per capita per day (2)

Minimum dietary diversity for women (MDD-W) and Minimum dietary diversity for infants and young children (MDD-IYCF): Share of women (or young children) who consumed at least the minimum recommended food groups the previous day, which makes it more likely they consume adequate micronutrients (2)

NCD-Protect: Average score for adults on an indicator of dietary practices protective against noncommunicable diseases, like eating enough fiber, on a scale from 0 to 9

NCD-Risk: Average score for adults on an indicator of dietary practices known to raise the risk of noncommunicable diseases, like eating too much sugar, on a scale from 0 to 9

↘ **Prevalence of undernourishment:** Share of the population that goes hungry—that is, lacks enough calories for a healthy, active life (SDG 2.1.1)

Soft drink consumption: Share of adults who consumed a sugar-sweetened soft drink, which are generally known to be unhealthy, during the previous day

→ **Ultra-processed food sales:** Annual per-person sales of ultra-processed foods, which are known to be associated with poor health outcomes

Zero fruit or vegetable consumption: Share of the population (adults or young children) who did not consume any fruits or vegetables the previous day (2)

Environment, natural resources, and production

→ **Agricultural water withdrawal:** Water withdrawn for irrigation each year, as a percentage of the total renewable water resources available

→ **Cropland area change:** Average percentage change in cropland over the previous five years; expanding cropland is a major driver of biodiversity and ecosystem service loss and greenhouse gas emissions

Greenhouse gas emissions intensity, by product group: Greenhouse gas emissions (kg CO_2 equivalents) per kilogram produced of certain important food commodities (4) (↘ beef, → cereal, ↘ milk, → rice)

Fisheries Health Index: An indicator summarizing the availability and sustainability of fish, which are at risk of overfishing or environmental degradation

→ **Food systems greenhouse gas emissions:** Greenhouse gas emissions (kt CO_2 equivalents) from food systems

Agricultural ecosystem function: Percentage of agricultural land area with enough semi-natural or natural habitat, relative to the amount of cropland or rangeland, to maintain biodiversity and functioning ecosystems

↗ **Pesticide use:** The use of pesticides per area of cropland (kg active ingredient per hectare); pesticide use can cause pollution and harm health

↗ **Nitrogen use efficiency:** A measure of the efficiency of nitrogen application in agricultural production

↗ **Food product yield, by food group:** Yield, or production per unit area (tonnes per hectare) or per animal (kg per animal)—an indicator of how efficient production is (5)

Livelihoods, poverty, and equity

→ **Share of agriculture in GDP:** Percentage of a country's GDP derived from agriculture, a measure of the level of economic development of the country

Child labor: Percentage of children ages 5–17 who are engaged in child labor, the majority of which is known to be in the food system and specifically in agriculture

Percentage of agricultural landowners who are female: A measure of the share of women among owners or rights-bearers of agricultural land

→ **Rural unemployment and** ↗ **Rural underemployment:** Percentage of working-age people in rural areas who are unemployed or underemployed (i.e., worked fewer hours than expected) (2)

Social protection adequacy: An indicator showing the extent to which social protection is sufficient to meet household needs

Social protection coverage: Percentage of people who live in households that benefit from social protection programs, like cash transfers and health insurance

Governance

↗ **Public access to information:** Whether the country has and implements guarantees for access to information (SDG 16.10.2)

↘ **Accountability Index:** An index capturing the extent to which the government is seen as being accountable for its actions

↘ **Civil Society Participation Index:** An indicator capturing the level of participation in civil society organizations

→ **Food safety capacity:** Whether functioning mechanisms exist to detect and respond to foodborne disease issues, measured as the percentage of a set of criteria met

National food system transformation pathway: Whether the country has developed a food system transformation pathway through the UNFSS process

↗ **Government Effectiveness Index:** An index capturing the perception of how effective the government is in making and enforcing policies and providing services

Health-related food environment policies: Whether the country has any health-related food environment policies, which are used to discourage consumption of unhealthy foods and beverages or encourage the consumption of healthy foods and beverages

→ **Open Budget Index:** A score based on how easily the public can access information about how the government raises and spends money

→ **Urban population living in cities signed on to the Milan Urban Food Policy Pact:** Percentage of the urban population that lives in cities signed on to the Milan Urban Food Policy Pact, suggesting prioritization of food issues in urban planning

Degree of legal recognition of the right to food: An indicator that classifies countries by the extent to which national laws or policies recognize or enact people's right to sufficient food

Resilience

→ **Disaster costs as share of GDP:** Cost of all damage from natural disasters, as a percentage of GDP

→ **Dietary Sourcing Flexibility Index:** An index capturing the diversity of pathways through which food reaches consumers, indicating how difficult it is to disrupt the food supply

↗ **Food price volatility and** ↘ **Food supply variability:** How much food prices and the food supply (in calories per person per day) vary over time, indicating how well the food system can respond to shocks (2)

↗ **Conserved genetic resources (plants and animals):** Number of plant and animal genetic resources for food and agriculture secured in medium- or long-term conservation facilities (2) (SDG 2.5.1)

↗ **Mobile phone subscriptions:** Number of mobile phone subscriptions as a percentage of the population, indicating the level of infrastructure and access to information to respond to shocks

Extreme coping strategies: Percentage of high-risk populations who need to rely on extreme strategies to cope with food insecurity

↗ **Social Capital Index:** An index for the social capital in the country—how much people feel they can trust and can rely on their government and one another

→ **Minimum species diversity:** Percentage of agricultural land (crop and pasture) containing a sufficient diversity of species, which helps cope with shocks and changes

Note: Numbers in parentheses indicate where there are multiple indicators or sub-indicators. Complete indicator descriptions are available in the peer-reviewed article.

This second annual Countdown report provides the first update on progress over time. It analyzes time trends in the indicators since 2000, illuminating the direction and pace of travel along the path toward or away from better outcomes. It also dives deeply into the complex and intertwined nature of food systems to examine the interactions that exist within and across these indicators and what they mean for designing evidence-based actions for food systems transformation. Interactions are critical because change (or lack thereof) in one indicator can cause (or block) changes in others. Knowing where these interactions take place is the first step in identifying key leverage points for intervention.

<table>
<tr><td>BOX 1. THE FOOD SYSTEMS COUNTDOWN INITIATIVE</td></tr>
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The Countdown is a global research initiative bringing together experts from all major world regions, diverse disciplines, and varied institutions, including UN agencies, academia, and civil society (a full list is available on the Countdown website). It monitors a set of food systems indicators and provides annual publications that support evidence-based policymaking and accountability to achieve food systems transformation. This independent initiative seeks to complement other monitoring efforts, such as those for the SDGs. The Countdown includes and integrates various sectors and geographies, ensuring that its analyses are responsive to stakeholder needs and sensitive to the diverse realities of local food system contexts.

In its first two years, the Countdown developed a monitoring framework focusing on five themes: (1) diets, nutrition, and health; (2) environment, natural resources, and production; (3) livelihoods, poverty, and equity; (4) governance; and (5) resilience. The Countdown collaborators then went through an iterative, highly consultative process to identify 50 actionable, widely available, and high-quality indicators that measure elements of these themes. The result was a comprehensive yet concise data snapshot of food systems that, when tracked over time, could help to assess whether food systems goals are being achieved, commitments are being realized, and policies are having an impact. In particular, since the five Countdown themes map closely to the national food systems transformation pathways of the UNFSS process, they can facilitate harmonized monitoring of these pathways across countries, supporting priority setting and tracking of UNFSS commitments.

Trends in indicators over time show reasons for optimism—but also that more progress is needed

The Countdown baseline report presented a snapshot of the levels of the 50 indicators in 2022, but to understand whether desirable levels are within reach, it is vital to know how they are changing over time. As such, the Countdown has now extended its analysis to consider global trends in the indicators since 2000 (Figure 1).[5]

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5. This analysis excludes indicators for which data cannot be comparably analyzed from one year to the next.

Figure 1. Trends for selected Countdown indicators by region

The results of the analysis offer reasons for optimism: of the 42 metrics examined, 20 have changed in a desirable direction on average globally. For example, within the diets, nutrition, and health theme, access to safe water—essential for food security and for keeping food safe – has increased across all regions, including in some regions that started out at low levels, such as Southern and Central Asia. Availability of vegetables—key components of a healthy diet that are currently underconsumed by many—has also increased significantly globally. This global improvement masks some regional setbacks, however: vegetable availability is largely stagnant in Northern Africa & Western Asia and Southern Asia and rising only slowly in several regions with low levels of availability (Sub-Saharan Africa, Southern Asia, Latin America & Caribbean, Oceania, and Southeastern Asia), leaving them far from catching up. Encouragingly, the share of people who go hungry (as measured by the prevalence of undernourishment) has declined across most regions—with impressively steep declines in Central and Southeastern Asia. Yet it has increased in others, notably Northern Africa & Western Asia, and remains intolerably high globally, given the capacity of hunger to hold back personal well-being, societal achievement, and economic growth.

Within the environment, natural resources, and production theme, yields of cereals, fruits, vegetables, milk, and beef have all increased, implying that more food is being produced on each unit of land or from each animal.[6] With a few exceptions, these improvements have cut across every world region, though they still leave major gaps in yields between the top-performing countries and regions and the lowest-performing ones. For example, annual milk yields in high-income countries currently average 7,467 kg per animal—more than 15 times the average level in low-income countries. Certain other indicators show improvements globally but with marked regional variations. For example, production systems have become more efficient at using nitrogen globally, meaning less is wasted as runoff that can pollute the environment, but this efficiency has decreased in Central Asia, Oceania, and Sub-Saharan Africa, resulting in greater waste in those regions. Moreover, the emissions intensity of beef (that is, the amount of greenhouse gases emitted per unit of beef produced) globally has fallen significantly, but in Sub-Saharan Africa it has risen substantially and is now the highest in the world. For each unit of beef produced in Sub-Saharan Africa, more than four times as many greenhouse gases are emitted than if that beef were produced in the most emissions-efficient region, East Asia.

Under the governance theme, government effectiveness and access to information are both increasing globally, reflecting greater government capacity to execute functions and make information available to citizens. While access to information has risen uniformly, the average increase in government effectiveness has been driven by dramatic upswings in Asia (Eastern, Southeastern, and Southern Asia), while other regions are trending slightly downward.

Within the resilience theme, conservation of genetic resources has increased for both plants and animals, suggesting that we are doing a better job at conserving and protecting the biodiversity that helps food systems cope with shocks and provides an essential resource for adapting to future changes. Mobile phone ownership is a proxy for access to infrastructure and connectedness—key elements in creating a society and food system that are resilient to shocks and changes. This rate has increased significantly since 2000, from one phone subscription per six people to more than one per person, signifying a world that is more connected and able to communicate and coordinate in times of shock and change. The variability of the food supply has significantly fallen globally, also suggesting a food system that is becoming better able to cope with shocks—though trends are inconsistent across regions.

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6. While increasing efficiency in production through higher yields is desirable to reduce inputs needed per unit of output, it can also have negative ramifications, such as growth in total production to ultimately have a larger environmental impact.

In contrast, seven indicators have worsened significantly over this period globally. The proportion of the population experiencing moderate or severe food insecurity has risen from 25% in 2015 to 31% in 2021, with increases occurring across most regions. Inflation pushed up the cost of a healthy diet in every region from 2017 (the earliest year with data) to 2022. Incomes also rose, however, with the net result that the percentage of people who cannot afford a healthy diet fell significantly, lowering a critical barrier to improved nutrition. At the same time, food price volatility has increased, suggesting less stable prices amid food system shocks. Rural underemployment rates have also risen globally, despite declines in Northern America & Europe, Southeastern Asia, and Oceania. Pesticide use has increased slightly, with a large increase in Latin America & Caribbean, suggesting increased risk of environmental pollution. Civil society participation and government accountability (measured using composite indices to capture these complex concepts) have both decreased, pointing to areas where governance is not rising to the challenge of supporting food systems transformation.

The remaining Countdown indicators have shown no change. In some cases, this is unsurprising: certain indicators have only a few years of data available or measure forces that are slow moving in nature. In other cases, such as cropland change, improvements in some regions have been offset by declines in other regions. In still other cases, such as agricultural water withdrawals, progress has been simply stagnant. For indicators where it seems that more progress could realistically be achieved, this lack of change highlights areas of potential future focus. For example, there have been no significant global changes in the emissions intensities for rice or other cereals or in total food system emissions. Given the large contribution of the food system to overall emissions, we cannot continue along such trajectories and expect to achieve long-term climate goals. Yet these indicators all show wide variations across regions, implying that emissions could be lowered in the lowest-performing regions if best practices were more widely adopted.

In addition to monitoring food system indicators, the Countdown also aims to make continual improvements in the data and indicators it uses and issues a clear call to action to fill data gaps. This year's analysis revised the indicator on health-related food taxes to cover a broader set of national health-related food environment policies. These policies include not only taxes but also other regulations, like nutrition labeling and restrictions on advertising. These types of policies can help discourage the sale and promotion of unhealthy foods, consumption of which raises the risk of several noncommunicable diseases, like diabetes. To develop this indicator, we used data from the World Cancer Research Fund's NOURISHING database, covering different food environment policies, which we categorized as either economic tools or mandatory regulations. Data are current as of 2023 and cover all countries. However, more resources were available to gather data on the European Union, so some newer policies and some policies in countries outside the European Union may not be captured. Details on how the indicator was developed are provided in the peer-reviewed paper (listed on the copyright page of this report).

These new data (Figure 2) show that most countries, aside from parts of Sub-Saharan Africa and Central Asia, are using economic or regulatory tools to improve the healthfulness of food environments. For example, Mexico taxes added sugars and requires warning labels on products exceeding healthy limits for added sugars and calorie density—policies that both local experts and research elsewhere credit with reducing consumption of soft drinks and sales of ultra-processed foods.

Although Countdown data cannot speak to causality, they do suggest that where these policies are lacking, outcomes are poorer. In Central Asia, a larger share of people drink soft drinks (sodas and sports drinks) daily than in any other region, at more than twice the global average: 43% versus 19%. Central Asia is also where an index capturing dietary factors that increase the risk of noncommunicable disease is the highest—that is, the least desirable—in the world. Such patterns are not as evident in Sub-Saharan Africa, perhaps because low incomes in the region make unhealthy foods less affordable. Notably, some Sub-Saharan African countries have passed new policies that are not yet captured in this dataset, which will be updated when the policy surveillance is repeated.
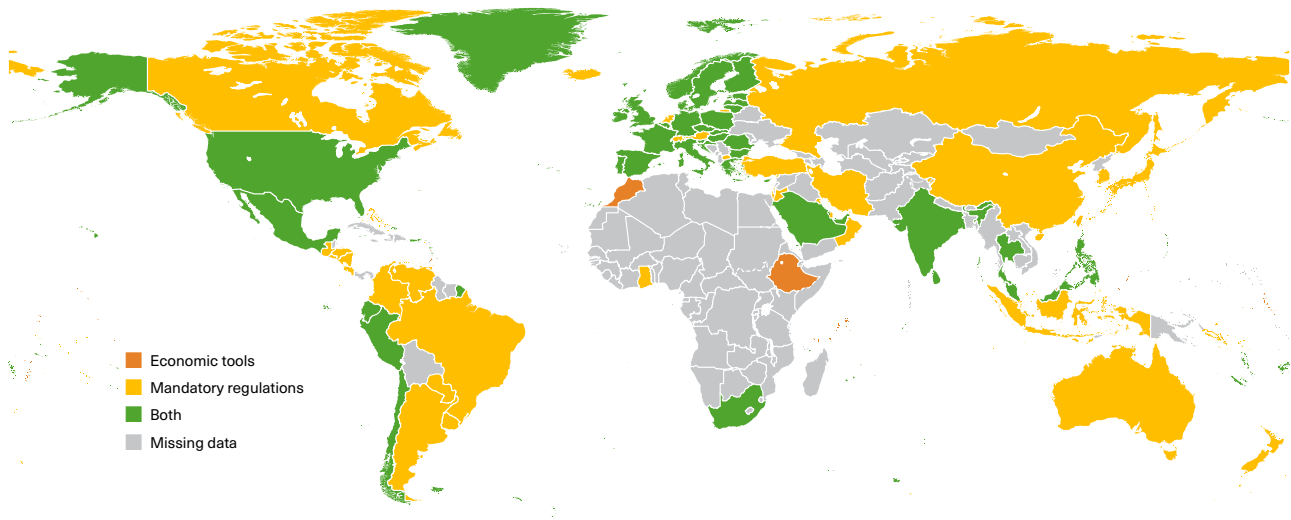
The boundaries and names shown and the designations used on these map(s) do not imply the expression of any opinion whatsoever on the part of Columbia University, Cornell University, FAO or GAIN concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries. Dashed lines on maps represent approximate border lines for which there may not yet be full agreement. Final boundary between the Republic of Sudan and the Republic of South Sudan has not been determined. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.

Figure 2. Countries using economic incentives and regulations to improve access to healthy foods
Source: FSCI. 2024. Food Systems Countdown Initiative Data: Presence of national health-related food environment policies. [Accessed 16 December 2024].
https://www.foodsystemsdashboard.org/fsci-indicators

Interactions among Countdown indicators are plentiful, diverse, and complex

One of the fundamental challenges with bringing about transformative changes in food systems is that different food systems components interact with one another: a change in one area can directly or indirectly affect another. This reality complicates decision-making and can give rise to trade-offs between goals as well as unintended consequences of actions. For example, policies targeting the short-term objective of reducing hunger by ensuring the availability of staple foods may favor large-scale monocropping that leads to cheap and abundant staple foods—without considering how such an approach could in the long term reduce biodiversity or make other nutrient-dense foods seem relatively expensive, reducing overall diet quality and harming nutrition.

But these linkages also represent an opportunity. Interactions can create synergies: positive change in one area can lead to cascading positive changes in other areas, and joint action across different parts of food systems can result in changes that are larger than the sum of the individual shifts. These powerful leverage points can serve as entry points for bringing about system-wide changes.

Understanding how food system components interact is thus vital for enabling and accelerating desirable change while limiting undesired and unintended outcomes. Interactions among indicators can illustrate these real-world relationships in a simplified way: where there is an indicator interaction, it is likely that the real-world actions and processes that those indicators reflect are also connected. To this end, the 2024 Countdown analysis drew on the diverse experiences of

Countdown collaborators, complemented by an analysis of prior research, to assess where there are interactions among the Countdown indicators globally (see Box 3 for a description of the methods used).

The results (Figures 3 and 4) reflect the experts' opinions on interactions between indicators and show only the direction of the interaction (from indicator A to indicator B, or vice versa), not whether it is positive (synergy) or negative (trade-off). They reveal that most indicators have theoretical interactions with other indicators, either direct or indirect, via intervening indicators. For example, the cost of a healthy diet was found to directly influence many other indicators within the theme of diets, nutrition, and health, such as the prevalence of undernourishment and experience of food insecurity. It was also directly connected to indicators in other domains, such as the percentage of high-risk populations that need to rely on extreme strategies to cope with food insecurity (a resilience indicator): as prices rise, usual strategies like eating less-preferred foods may no longer be sufficient and vulnerable people may be pushed toward strategies like begging or skipping meals.

Agricultural yields were found to affect (directly or indirectly) numerous indicators related to both diets, nutrition, and health and environment, natural resources, and production, but also to have indirect relationships with several indicators related to governance and resilience. For example, yields might indirectly influence the social capital index through the proportion of the population experiencing food insecurity and coping strategies. Increased yields tend to provide more sources of food, lower food prices, and increase food producers' incomes, all of which improve food security and decrease the need to rely on extreme coping strategies. Extreme coping strategies can harm relationships and decrease social capital. But increased yields also tend to be linked to increased pesticide use and water withdrawal.

Not surprisingly, given that governance and resilience were conceived as cross-cutting themes within the Countdown framework, they show the largest number of connections to other themes. For example, civil society participation (within governance) was suggested to be connected to all but one indicator. For example, it could potentially influence child labor rates, legal recognition of the right to food, or food safety capacity by bringing more attention to these important issues and thus helping spark progress on addressing them. In about 4% of the potential pairs, the causal relationship was noted to go in both directions, suggesting two-way feedback loops. For example, fruit and vegetable availability affected consumption of these foods: something must be available to be eaten. But consumption of fruits and vegetables might also affect availability by sending a market signal that there is more or less demand for those foods, which could lead farmers to increase or reduce production.

Figure 3 also suggests where actions will (or will not) have desired impacts. Rows that are highly connected to many columns, such as food price volatility, suggest areas where a change could have broad impact across themes: by lowering food price volatility, we may be able to improve diets, bring about more sustainable agricultural practices, and improve employment in rural areas. Indicators in columns with direct connections from multiple rows have many drivers, suggesting that desirable change may require coherent actions across all influencing domains. For example, it may not be possible to achieve minimum dietary diversity goals without improving food availability, increasing yields, strengthening social protection, and reducing volatility in food prices and supplies.

The analysis based on expert knowledge globally was also supported by country case studies from Ethiopia, Mexico, and the Netherlands (Box 4).
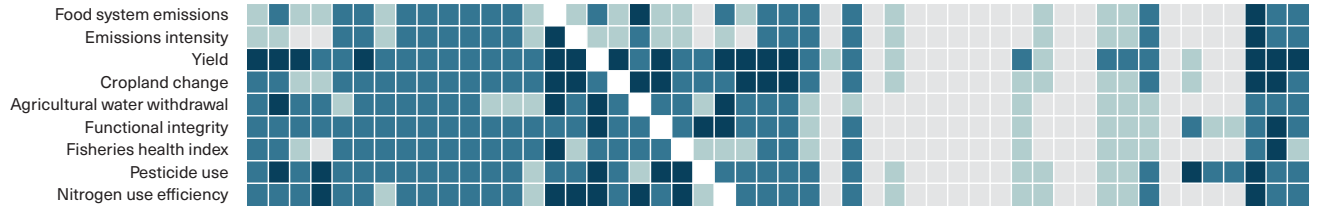
Overall, the analysis makes clear that interactions among Countdown indicators are plentiful, diverse, and complex. By harnessing these as synergies, or managing them as trade-offs, the desired outcomes of food systems transformation can more readily be achieved.
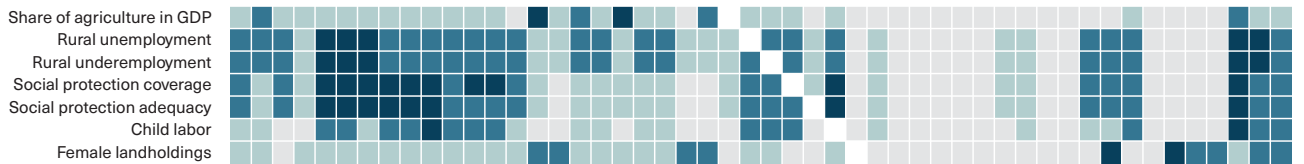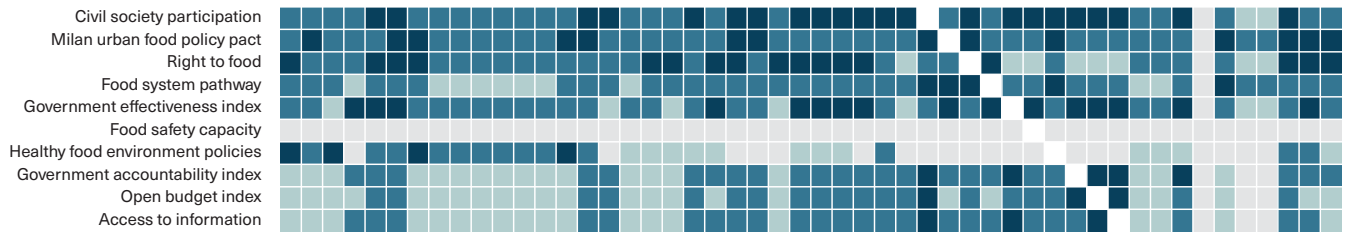
Diets, nutrition, & health
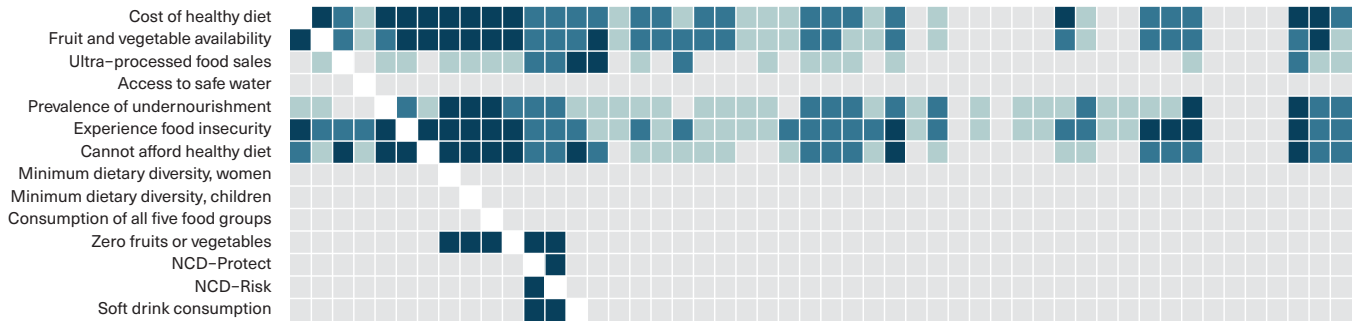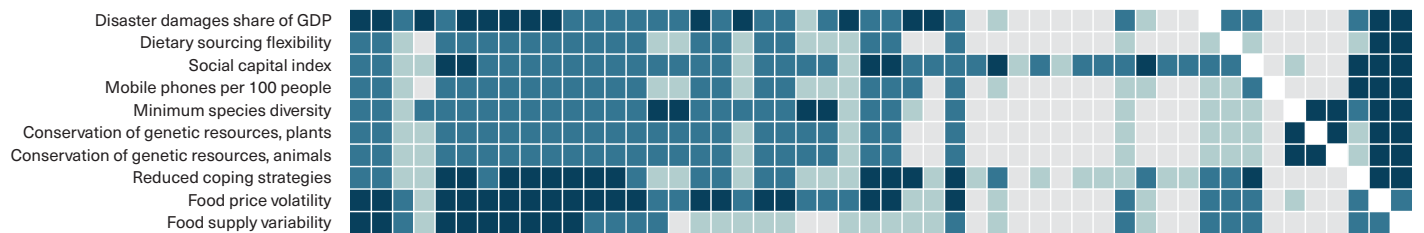

Environment, natural resources, & production

Livelihoods, poverty, & equity

Governance

Resilience

CLOSEST CONNECTION

- Direct connection
- Indirect connection via 1 indicator
- Indirect connection via 2 indicators
- No connections or indirect connection via 3 indicators or more

Figure 3. Causal relationships among Countdown indicators, as assessed by global food systems experts

According to the expert elicitation. The darkest cells show where experts assessed there is a direct causal relationship from the indicator in the row to that in the column. Medium blue reflects an indirect relationship via one connecting indicator, and lightest blue is indirect via two connecting indicators.

NUMBER OF DIRECT CONNECTIONS
(from and to, combinded)

○ 10 ○ 20 ○ 30

THEME

● Diets, nutrition, & health ● Environment, natural resources, & production
● Governance ● Livelihoods, poverty, & equity ● Resilience
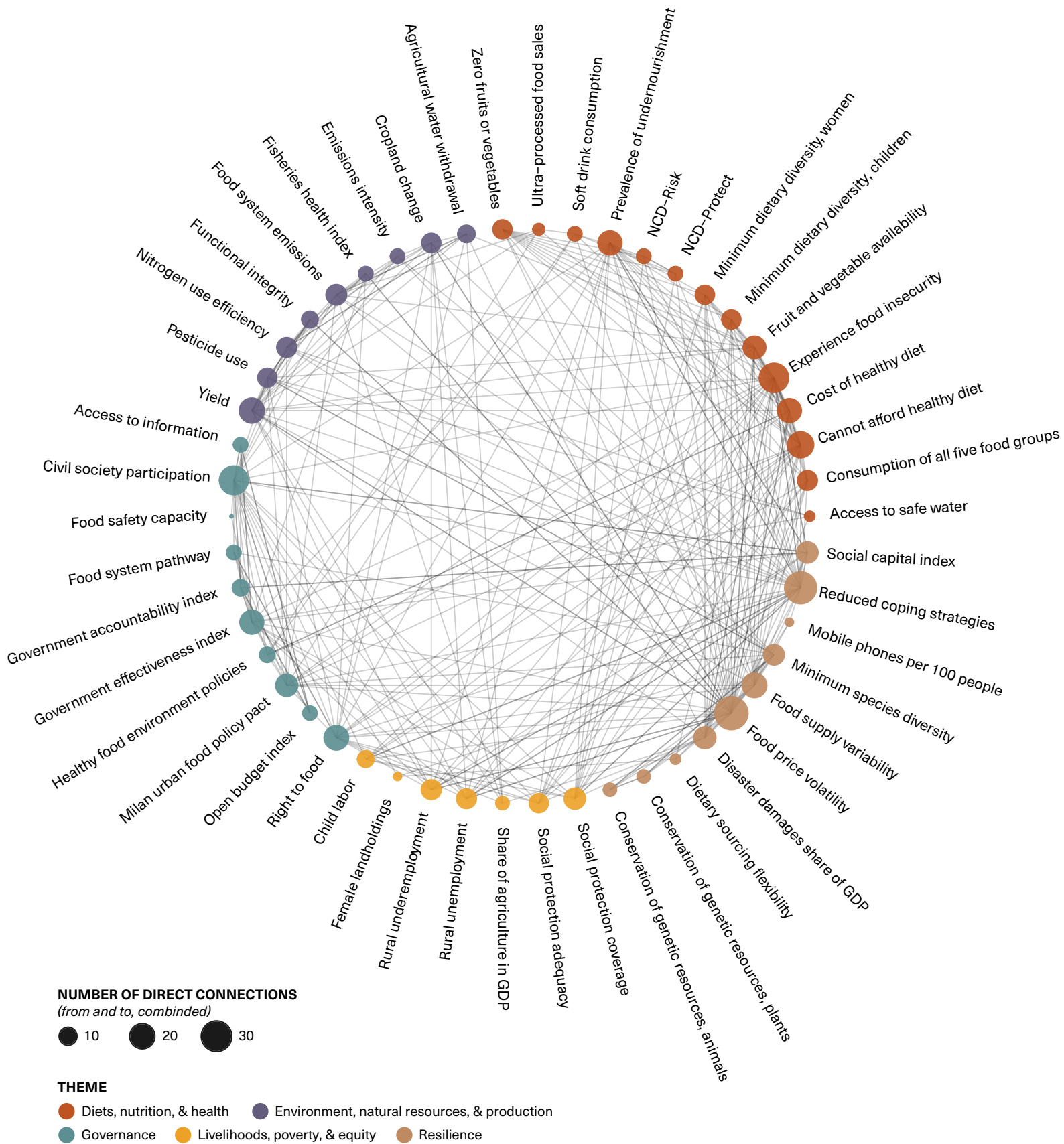
Figure 4. Direct connections between indicators, as assessed by food system experts

Understanding that relationships among indicators might be context specific, we also undertook three country case studies—in Ethiopia, Mexico, and the Netherlands—representing different regions and types of food systems. Through facilitated discussions with 14–20 food system experts in each country, we considered whether the interactions identified globally were also relevant in the national context—and specifically whether a given interaction was relevant for achieving each country's national food systems transformation goals. We limited the discussion to the governance domain and its interactions with other domains, considering whether each governance indicator had a relevant interaction with each other indicator, and where it did, whether these interactions represented synergies or trade-offs.

In both Ethiopia and Mexico, most interactions examined were considered highly relevant. Netherlands stakeholders, in contrast, found that only about a third of the examined interactions were highly relevant, largely due to political opposition to and lobbying against food system change. Encouragingly, local stakeholders considered most relationships to be synergies, where positive change in one area would facilitate positive change in another. Exceptions to this included the legal recognition of the right to food, which could have unintended consequences for land use change, agricultural water withdrawal, and pesticide use if land were converted to intensify food production. Health-related food environment policies were also seen as having some potential negative unintended effects, such as raising the cost of a healthy diet, if not properly managed.

Conclusions and future work

The Food Systems Countdown Initiative aims to illuminate the complexity of food systems to provide actionable insights. The 2024 Countdown analysis, a diverse, multidisciplinary, international collaboration, advances this goal by examining the interactions within the food system. This analysis demonstrates several points:

- Most food system indicators interact with other indicators, either directly or indirectly, meaning that change in any one area of food systems is likely to affect others and that unlocking change may require coordinated action across multiple dimensions.

- Certain indicators related to governance and resilience are key leverage points (shown as highly connected across rows in Figure 3). These themes are cross-cutting in terms of their influence and dependence on other aspects of food systems, and change in them can affect many other indicators. Working to shift them could thus pay large dividends. Policymakers should prioritize actions to improve these indicators.

- Other indicators, such as diet quality and food price volatility, have many contributing factors (shown as highly connected across columns in Figure 3). For these indicators, achieving change requires substantial coordinated action across sectors and actors and should be a key focus of efforts to improve policy coherence.

- While these interactions are relevant globally, their significance varies across countries.

The process of explicitly considering interactions can in itself be helpful: the stakeholders involved in the country workshops in Ethiopia, Mexico, and the Netherlands testified that the process stimulated needed discussions and connections to break out of business as usual. The results can also be actionable. Focusing efforts on the highly connected areas highlighted in this report can help maximize leverage, prioritizing the changes that could have the broadest impacts across many areas of the food system. For outcomes that are highly influenced by multiple aspects of the food system, progress will depend on collaboration across sectors.

Such progress is essential as the clock ticks toward 2030—the deadline for achieving the SDGs. The 2024 Food Systems Countdown analysis highlights that, over the past two decades, important progress in improving food systems has been made. Of 42 indicators examined, slightly fewer than half (20) changed in a desirable direction from 2000 to 2022. These positive signs include large decreases in the prevalence of undernourishment, increases in the yields of several food products, and growing numbers of plant and animal genetic resources being conserved in gene banks to

improve the resilience of the food system. Yet over the same period, 7 indicators changed in an undesirable direction. Food insecurity has worsened, as have rural unemployment and pesticide use. For 15 of the indicators, there has been no significant change—despite the need for steady progress on all fronts if we are to meet key global goals.

Analyzing trends, however, provides only partial insight into how close we are to achieving those goals or whether we are moving at the right speed in the right direction toward them. Making this judgment—how well food systems are performing around the world, relative to key benchmarks—will be the focus of the 2025 Countdown analysis. We will also continue to highlight gaps in data for food systems monitoring and work to fill them as feasible—as done with this year's novel inclusion of an indicator on food environment policies. We will also engage with stakeholders around the world to

facilitate the uptake and use of the Countdown for monitoring food systems transformation, including through country-level workshops to ensure local relevance.

The 2024 Countdown report shows that progress toward food systems transformation is not only possible but already occurring. It is time to double down on this progress in aspects of the food system where it has occurred and refocus energy on those aspects where it has not, while remaining aware that no part of the food system is free of interactions with others. Progress cannot be achieved in isolation—it requires a holistic approach that recognizes the intricate web of connections within our global food systems and harnesses these interconnections to drive transformative change across all sectors—but it can be achieved.