



THE FOOD SYSTEMS COUNTDOWN

REPORT

2023 | THE STATE OF FOOD SYSTEMS WORLDWIDE



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Executive summary

Food systems are a foundation of human and planetary well-being and central to achieving the Sustainable Development Goals. Yet they also contribute to ill health, inequity, environmental degradation, and greenhouse gas emissions. These challenges demand urgent food systems transformation. Such a transformation requires understanding the status of food systems across their diverse functions. The Food Systems Countdown Initiative (“the Countdown”) aims to enable this understanding by monitoring the state of food systems transformation through relevant data, independent of any established monitoring processes. Such monitoring can help align decision makers around key priorities, incentivize action, hold stakeholders accountable, sustain commitment by demonstrating progress, and enable course corrections.

The Countdown is an interdisciplinary collaboration of scientists that emerged from the 2021 United Nations Food Systems Summit. Over a two-year process, the collaboration developed a framework to monitor food systems that includes 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 then used a rigorous, multistakeholder process to arrive at 50 indicators to monitor change across these five themes. The 50 indicators provide a comprehensive yet concise picture of food systems. They also reveal data gaps that need to be filled for better future food systems monitoring.

This first annual Countdown report depicts the current state of national food systems, providing a baseline that can be used to guide priorities for investment, research, and policymaking and assess future progress. The Countdown baseline data show that the world’s food systems face many shared challenges. For example, in 54 countries (of 140 with data), over half the population cannot afford a healthy diet. Only 29 countries (of 187 with data) explicitly recognize the right to food, and only 4 countries approach equitable distribution of landownership between men and women. There is also considerable inequality in indicator performance across countries (and likely within countries, although subnational dimensions are not yet systematically tracked globally).

While every country shows relatively strong performance in some parts of its food systems, no country, region, or income group shows such performance for all 50 indicators. For example, low- and middle-income countries generally lack sufficient fruits and vegetables to allow their populations to meet dietary recommendations, while high-income countries have widespread availability of the ultra-processed foods that are associated with poor health outcomes. Additionally, health-related food taxes exist in 38 countries spread across all continents and income groups but are absent in most.



This variation in countries across income levels and regions indicates that there are considerable opportunities for regional collaboration and cross-country learning.

Although the Countdown has assembled a comprehensive set of food systems data, its work has also revealed many gaps in available data. Some gaps, like data on food loss and waste, cut across themes. Other gaps pertain to country coverage, food value chains beyond production, and livelihoods of food system workers other than farmers. These data gaps must be filled to better guide action to transform food systems.

When interpreted with careful attention to the local context, the Countdown data provide a strong starting point for assessing food systems challenges as well as opportunities to secure access to healthy diets and good livelihoods for all while ensuring environmental sustainability.



Introduction

Food systems are a foundation of human and planetary well-being—while at the same time contributing to ill health, inequity, environmental degradation, and greenhouse gas emissions. To transform them to do better requires tracking the performance of food systems across their diverse functions and using that information to incentivize action and support accountability.

The Food Systems Countdown Initiative (“the Countdown”) was established to meet this need. It is an interdisciplinary collaboration of dozens of scientists from civil society, academia, and the United Nations (UN) who came together after the 2021 UN Food Systems Summit (UNFSS) process. By monitoring a set of indicators selected through a consultative process, its annual publications will support evidence-based policymaking and accountability to achieve essential food system transformation. The effort is independent of any established monitoring processes.

This report—the first in a planned annual series—is a first step. It presents the Countdown indicators depicting the current state of national food systems. In doing so, it provides a starting point for future work to identify where things can be done better, provide ideas for how to get there, and inspire stakeholders (in particular, policymakers) that progress can and must be made.

The need for food systems transformation

Food systems are essential for sustainable development and connected to all 17 Sustainable Development Goals (SDGs).^a Employing over a billion people,² food systems fundamentally shape lives. As our source of food, they underpin human health and the prevention of disease and are central to cultural traditions globally. Food systems that are sustainable also contribute to planetary health by supporting ecosystems that provide necessary services, like crop pollination and biodiversity. Their development has contributed to great gains for humanity throughout history.

a. Food systems are “all the people, places, and practices that contribute to the production, capture or harvest, processing, distribution, retail, consumption, and disposal of food.”¹ Food systems are complex to analyze because they are dynamic, characterized by interactions and feedback loops across their different parts, and closely connected with other systems. The term “food systems” is used in line with the UNFSS language. However, the Countdown indicator framework considers broader agrifood systems encompassing activities and processes related to nonfood agricultural products (such as forestry, fibers, and biofuels) that are interconnected with food for human consumption. Many indicators cannot distinguish food and nonfood components of production and value addition, and nonfood components greatly influence the environment, social outcomes, and the food people ultimately eat.

At the same time, food systems face and contribute to significant challenges. Sufficient, safe, and nutritious food is not accessible to all: in 2022, 735 million people were undernourished and 3.1 billion could not afford healthy diets.³ People's diets are generally too low in healthy foods (including legumes, vegetables, and fish, among others) and too high in unhealthy foods (like ultra-processed foods). Every country struggles with at least one form of malnutrition, from undernutrition to diet-related noncommunicable disease, and many countries suffer from more than one. Unsafe food causes more than half a million cases of illness a year.⁴ Moreover, food system workers commonly earn low incomes and face poor working conditions, and many food supply chains are characterized by power imbalances, which contribute to inequities in livelihoods and access to food.

Food system activities are both drivers of environmental degradation and vulnerable to that degradation. Food systems use about 40% of global ice-free land⁵ and up to 55% of ocean area,⁶ use about 70% of global freshwater,⁷ and account for about 30% of greenhouse gas emissions due to human activities.⁸ Food systems also contribute to land and water pollution and biodiversity loss. And vulnerabilities within food systems are heightened by shocks, such as pandemics, economic recessions, conflicts, and natural disasters. However, food systems also offer a powerful lever for mitigating climate change and averting further environmental catastrophe.



BOX 1. THE COUNTDOWN AND THE SDGs

The Countdown indicators share some overlap with the SDGs, underscoring the relevance of the sustainable development agenda for food systems transformation. However, the SDG framework is incomplete when it comes to food systems monitoring, which was not a mainstream approach when the SDGs were developed. Five (of 240) SDG indicators are specific to food systems and meet the criteria for inclusion in the Countdown; all are included here. Three more SDG indicators—for sustainable agriculture, food loss and waste, and women's agricultural landownership—will be added to the Countdown when data become available.

As food systems become more widely understood, some of the Countdown indicators that are not in the SDG indicators could be considered for the next set of global goals.

These food system challenges mean that transformation is urgently needed to make food systems true supporters of human and planetary health, providers of high-quality and equitable livelihoods, and resilient to increasingly frequent shocks and stresses.

Recognition of the importance of food systems was boosted by both the 2021 UNFSS and the recent and upcoming UN Climate Change Conferences of the Parties (COPs), increasing the momentum behind food systems transformation. But monitoring will be needed to ensure that transformation efforts are directed at the most relevant food systems components and that intentions translate into action. This means tracking the performance of food systems across their diverse dimensions. Monitoring can help align food system actors around key priorities, incentivize action, hold stakeholders accountable, sustain commitment by demonstrating progress, and enable course corrections. A focus on food systems, specifically, can complement other monitoring efforts (Box 1). An independent monitoring framework is particularly essential as it avoids real and perceived conflicts of interest that could limit the effectiveness of monitoring and any subsequent actions.

The Countdown aims to meet this need by independently monitoring the state of food systems transformation using the best available data, selected through a rigorous process. In other words, it will assess where food systems-related global goals are being achieved, commitments are being realized, and policies are having an impact.

The Countdown: People, framework, and methods

The Countdown is composed of a broad and geographically diverse group of researchers from various disciplines and types of institutions, including UN agencies, academia, and civil society (a full list is available on the [Countdown website](#)). This diversity of participation is central to its strength, as the Countdown aims not only to consider food systems comprehensively across domains but also to ensure that these analyses are sensitive to stakeholder needs and local food system contexts, which vary widely around the world.

The Countdown framework for monitoring food systems comprises five themes that address the challenges and benefits of food systems described above.¹ Three themes

focus on the outcomes of food systems—(1) diets, nutrition, and health; (2) environment, natural resources, and production; and (3) livelihoods, poverty, and equity—and two cross-cutting areas focus on (4) governance and (5) resilience. These themes arose from systematic analysis of food systems guided by the food systems framework of the High-Level Panel of Experts of the Committee on World Food Security of the UN,⁹ as well as established global goals, the entry points for change, and the processes and capacities needed to bring about that change.

Within each theme, Countdown collaborators identified a set of indicator groups (Figure 1) and then used a multistakeholder consultative process to identify indicators to track within each domain (Box 2). The aim was to provide the most comprehensive yet concise picture of food systems possible, given available data and with practical uses in mind (Box 3).

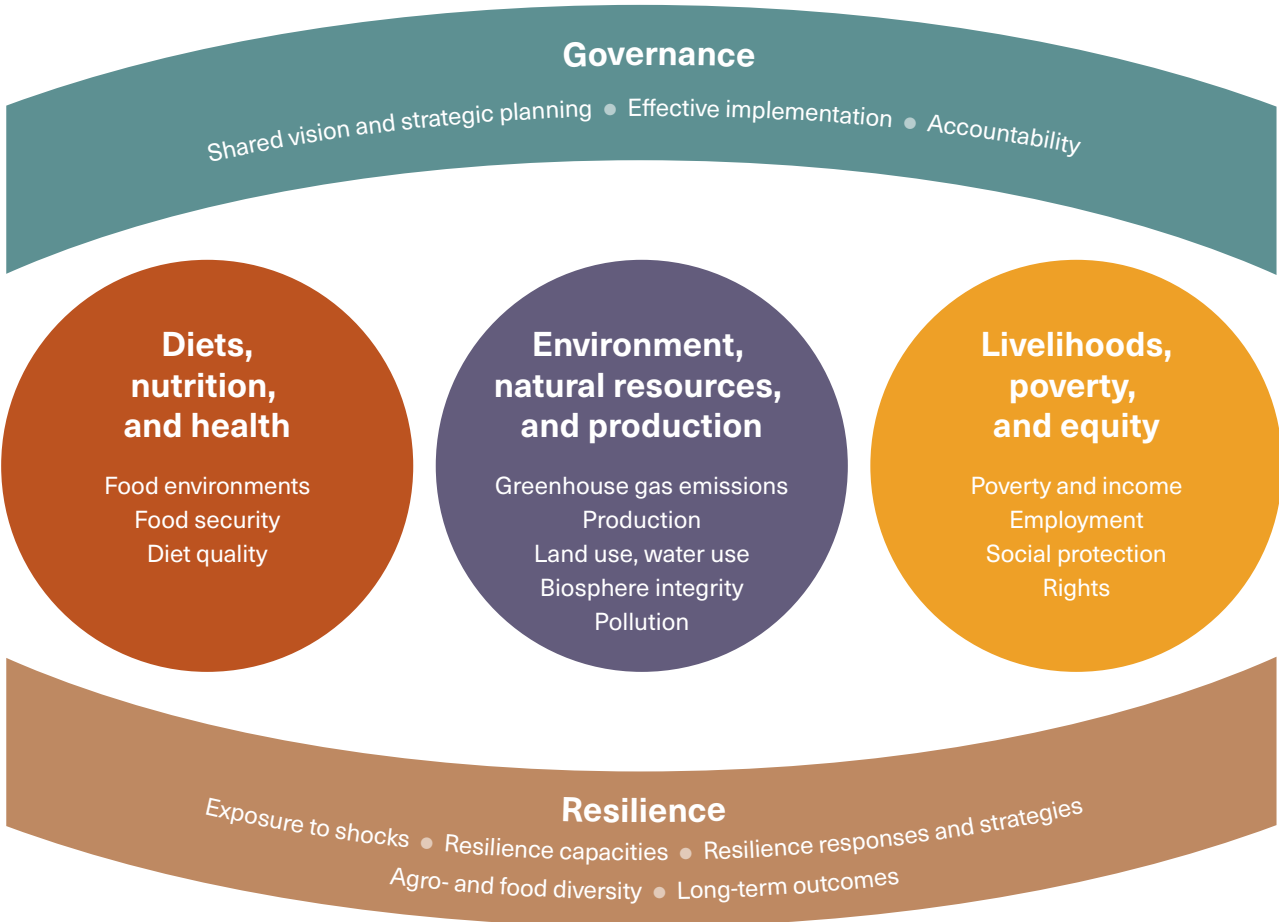


Figure 1. Countdown themes and indicator groups. Outer shapes refer to cross-cutting themes. Interior circles refer to long-term outcomes.

BOX 2. METHODOLOGY TO SELECT AND ANALYZE THE COUNTDOWN INDICATORS

Indicators were selected through a multistage process involving several groups of stakeholders. First, Countdown thematic working groups drafted a list of potential indicators. This initial list was screened for feasibility (are recent data in the public domain, and are they expected to be updated within the next eight years?), coverage (are data available for at least 70 countries across regions and income levels?), and transparency (do all modeled indicators have clear methodologies?).

Second, all potential indicators that met the initial screening criteria were assessed to ensure they met criteria of relevance, high quality, interpretability, and usefulness. To do this, the Countdown conducted an online survey of all Countdown collaborators and more than two dozen external experts. Respondents were asked to rate each indicator's relevance, quality, and interpretability and provide qualitative feedback on its importance. The external experts were also asked to suggest additional data sources and highlight any gaps they observed in the indicators, along with recommendations to fill those gaps. Third, crucial input on regional priorities and policy utility was obtained through regional consultations with policy stakeholders, led by the UN Food and Agriculture Organization. Over 500 experts and government officials participated. Participants were asked to assess the relevance of the indicators, share regional priorities, and suggest alternative indicators and data sources. The combined consultation and survey led to the addition of 12 new indicators to the indicator framework—and also revealed certain gaps that could not be filled.

Based on the results of this assessment process, Countdown working groups used the survey scores and the input from policy actors to identify the final indicators for each theme, resulting in the indicators presented here. These were assembled into a comprehensive dataset, including all available years of data for all UN Member States, going back to 1960 for certain indicators. For this report, we focus on a baseline dataset that includes the most recent data point for each country. (In most cases, data are from 2017–2022, with only 1% of data coming from before 2010). We use the World Bank's country income classification to identify countries by income group. Full methodological details are available in the published, peer-reviewed article.



BOX 3. USES OF THE COUNTDOWN DATA

The Countdown data and framework have several potential uses:

- **Global monitoring of food systems.** The baseline data provide a starting point for global monitoring of food systems and serve as inputs for considering what changes in indicator values are achievable, along which time frames.
- **Tracking of UNFSS commitments.** The five Countdown themes map closely to the national food system transformation pathways from the UNFSS process, so they can facilitate harmonized monitoring of these pathways across countries, supporting priority setting and tracking of UNFSS commitments.
- **Development of national monitoring systems.** While this indicator framework is intended for global monitoring of food systems transformation, it offers a menu of indicators relevant to the design of policies and actions at the country level. It can thus be used as a point of reference for developing national monitoring systems adapted to country needs.

Different actors may find certain indicators more useful than others. For example, donors may employ cross-country comparisons when deciding how to allocate resources. National policymakers may focus on indicators under more direct national control to assess their country's performance relative to neighbors or over time.

A snapshot of global food systems in 50 indicators

Through the process described above, we agreed upon 50 indicators that jointly provide a snapshot of the current state of food systems across all five themes (Table 1). These 50 indicators include some that are well established, such as greenhouse gas emissions and the prevalence of hunger, as well as others that are relatively new or even created by the Countdown, such as the share of the urban population living in cities that have

signed onto the [Milan Urban Food Policy Pact](#), which is the leading international tool for urban food policy governance. They include indicators that are specific to food systems, such as crop yields, as well as those that are not but have clear influence on the enabling environment for food systems transformation, such as the Government Effectiveness Index, which measures the quality of public services, the civil service, and policy formulation, implementation, and credibility. The indicators cover every domain within each theme, providing by far the most comprehensive data-based depiction of food systems available to date.^b

b. Other efforts to monitor certain aspects of food systems include [INFORMAS](#), which covers 58 countries and focuses on actions to support food environments, particularly as related to the prevention of obesity and diet-related noncommunicable diseases; the [Comprehensive African Agricultural Development Programme \(CAADP\) Biannual Review process](#), which tracks progress in African agricultural development; and the [Food Sustainability Index](#) of the Economist Intelligence Unit, which monitors 67 countries based on nutrition, sustainable agriculture, and food loss and waste.

Table 1. The Countdown indicators

 Diets, nutrition, and health		
<p>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)</p> <p>Consumption of all five food groups: Share of the adult population consuming all five food groups typically recommended for daily consumption</p> <p>Population who cannot afford a healthy diet: Share of the population whose food budget is less than the cost of a healthy diet</p> <p>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</p> <p>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)</p>	<p>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)</p> <p>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)</p> <p>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</p> <p>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</p>	<p>Prevalence of undernourishment: Share of the population that goes hungry—that is, lacks enough calories for a healthy, active life (SDG 2.1.1)</p> <p>Sugar-sweetened soft drink consumption: Share of adults who consumed a sugar-sweetened soft drink, which are generally known to be unhealthy, during the previous day</p> <p>Ultra-processed food sales: Annual per-person sales of ultra-processed foods, which are known to be associated with poor health outcomes</p> <p>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)</p>
 Environment, natural resources, and production		
<p>Agricultural water withdrawal: Water withdrawn for irrigation each year, as a percentage of the total renewable water resources available</p> <p>Cropland expansion: 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</p> <p>Greenhouse gas emissions intensity, by product group: Greenhouse gas emissions (kg CO₂ equivalents) per kilogram produced of certain important food commodities (4)</p>	<p>Fisheries Health Index: An indicator summarizing the availability and sustainability of fish, which are at risk of overfishing or environmental degradation</p> <p>Food systems greenhouse gas emissions: Greenhouse gas emissions (kt CO₂ equivalents) from food systems</p> <p>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</p>	<p>Pesticide use: The use of pesticides per area of cropland (kg active ingredient per hectare); pesticide use can cause pollution and harm health</p> <p>Sustainable nitrogen management: A measure of the environmental efficiency of agricultural production</p> <p>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)</p>



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

Female share of landholdings: Percentage of land for which the primary decision maker is female

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 taxes: Whether the country has any health-related food taxes, which are used to discourage consumption of unhealthy foods

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.





While many goals are common across food systems, some are context specific. Moreover, for some indicators, the desirable direction of change depends on the starting point and the structure of the food system. As such, when used for decision making, the Countdown results should be interpreted with careful attention to the local context.

Still, the Countdown global baseline data make it clear that the world's food systems face many shared challenges—but also that there is considerable diversity across countries. Indeed, no country, region, or income group shows desirable values for all indicators.

Diets, nutrition, and health. Looking at indicators of the food environment—the interface between individuals and the food system—there is clearly considerable global inequality in terms of critical factors that shape whether people can choose to eat healthy diets. In general, low- and middle-income countries (LMICs) struggle to have adequate supply of foods from the healthy food groups (fruits, vegetables, and animal-source foods, among others) to meet dietary recommendations. For example, the global median for vegetable availability is 210 grams per person per day, but for low-income countries vegetable availability averages just

128 grams per person per day, and in two of those countries, daily per-person availability is less than 20 grams. In contrast, higher-income countries have widespread availability of nutrient-poor ultra-processed foods, consumption of which is widely associated with negative health outcomes. While a healthy diet costs about the same amount across most countries, incomes vary widely. Thus, healthy diets are mostly unaffordable in LMICs: in 54 countries (of 140 with data), more than half the population is estimated to not be able to afford a healthy diet (compared with near zero in the highest-income countries), and in certain African countries, the share of the population that cannot afford a healthy diet exceeds 95%. It is urgent to address this inequality by making sure that all people, everywhere, have access to healthy diets.

Environment, natural resources, and production. Total food system emissions are generally increasing and remain high, despite global commitments to reduce emissions and the pressing need to do so. Water withdrawals are stable or modestly decreasing everywhere, though they show considerable variation, from near zero to close to 100% of total renewable water resources in the Northern Africa and Western Asia region. Pesticide application has increased in many countries, with potential for increasing agricultural yields—but also for harming environmental and human health. In 20 countries, less than two-thirds of agricultural lands have sufficient integrity of agricultural ecosystems to maintain key activities like crop pollination, pest regulation, and soil protection. This underlines the importance of creating better protections for and incentives to maintain native ecosystems and biodiversity, necessary for the functioning of future food systems.

Livelihoods, poverty, and equity. Data for this theme were particularly incomplete, but even a partial view of food system-based livelihoods suggests deep inequalities. Unemployment is common in urban areas, while underemployment is more prevalent in rural areas (where the population largely remains highly dependent on agriculture). Social protection programs can provide much-needed safety nets for food system workers, who may be vulnerable to low pay and seasonal unemployment, but coverage currently varies widely (from less than 10% of the population in 24 countries to over 90% in 3 countries). Even where there is adequate coverage, the level of benefits provided may be insufficient to make a meaningful difference, and informal and seasonal workers, who make up much of the food system labor force, are often excluded. Finally, data on access to land show how far is left to go in terms of empowering women within and beyond agriculture: only 4 countries approach equitable distribution of landownership between men and women, and in 18 countries (of 99 with data), the share of land owned by women is less than 10%.

Governance. The Countdown's governance theme includes indicators specific to food systems as well as those that capture broader governance processes, which can have significant impacts on food systems. Whereas indicators of overall governance tend to track country income and are thus higher for higher-income countries, indicators more closely related to food systems vary considerably across regions and income groups. For example, only 29 countries explicitly recognize the right to food; several high-income countries are among those with no legal recognition. Similarly, health-related food taxes exist in just 38 countries spread across all continents and income groups. This diversity indicates the potential for countries from any region or income group to improve their food systems through better food-specific governance measures. At the same time, governance shortcomings beyond the food system may continue to constrain food system transformation.

Resilience. The Countdown resilience indicators show considerable variation across countries: the effects of shocks on food systems differ widely by context, as does the way in which they are managed. Resilience indicators focus on capacity to respond; for example, mobile phone infrastructure—which enables people to share information to prepare for and respond to shocks—has become nearly ubiquitous over the past two decades, with 115 countries (of 186 with data) having more mobile subscriptions than they have population. Species diversity and conservation of genetic resources are highly skewed. Most countries have inadequate levels of agricultural biodiversity—a global median of just 14% of agricultural land attains a minimum level of species diversity. Most countries also have limited ability to increase diversity in the future through conserved genetic resources. But for both indicators, there are other countries with considerably higher levels.

Food system indicators are closely, but not universally, associated with income level

Many aspects of food systems are associated with country income level. As shown in Figure 2, high-income countries tend to perform above average on most indicators, typically followed by middle-income and then low-income countries. However, there are numerous exceptions to these trends, in terms of both indicators where high-income countries perform worse, such as consumption of sugar-sweetened soft drinks and pesticide use, and indicators with unclear income patterns, such as greenhouse gas emissions intensity, health-related food taxes, and rural unemployment. Moreover, within every income group, some countries perform better than others. Among low-income countries, Mozambique, and Uganda rank near the global median across all indicators—that is, they are doing better than would be expected based on income alone. Kazakhstan, Nigeria, the Philippines, and Sri Lanka also tend to outrank their income-group peers. Identifying these positive outlier countries can enable learning from their approaches among poorer-performing countries. On the other end of the spectrum, several high-income countries rank worse than countries with fewer resources. And several Countdown indicators, such as sustainable nitrogen management, vegetable yields, or women's landholdings, do not show any clear connection with national gross domestic product.

These results emphasize the importance of taking a food systems-specific approach to monitoring: the challenges and strengths of a country's food system cannot be assumed based just on income. They also confirm that countries across the income spectrum can realistically aspire to positive food system transformations—and that other countries, such as the high performers named above, may have useful lessons for how to do so.



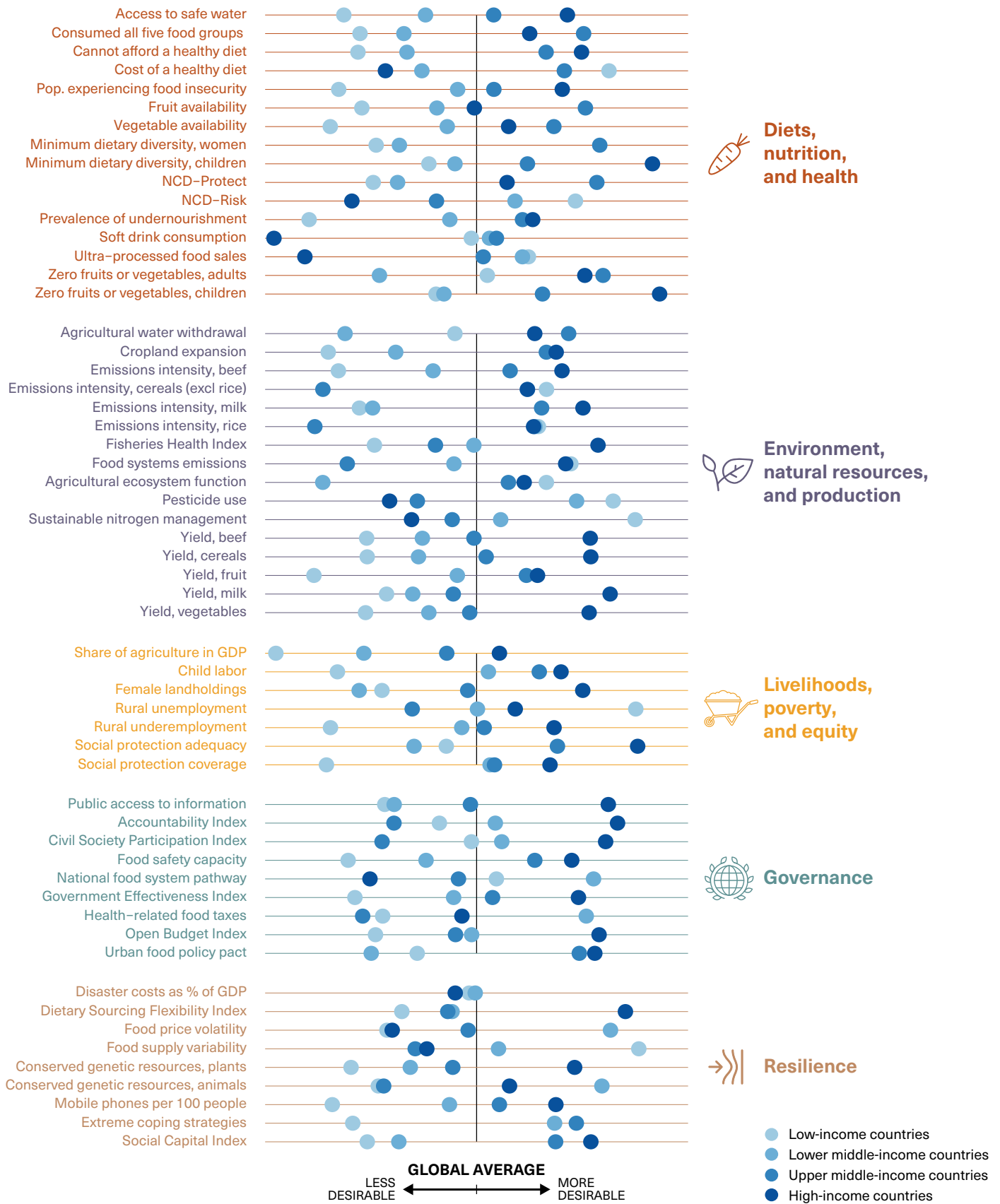


Figure 2. Summary of indicator performance by country income group. Dots show each income group's deviation from the global average in either a more desirable (rightward) or less desirable (leftward) direction. The data in the figures are scaled to enable comparison of variables that have different units on a common scale. The direction of some indicators has been adjusted so that each indicator has the same direction of desirability. Descriptions of the indicators appear in Table 1. NCD = noncommunicable disease. Pop. = population. GDP = gross domestic product.

Food systems indicators show many consistent variations across regions

Figure 3 highlights patterns in selected Countdown food system outcome indicators across regions by showing a given region's deviation from the global average value in either a more desirable (rightward) or less desirable (leftward) direction. Indicators related to diets, nutrition, and health generally show clear regional patterns, with Sub-Saharan Africa, and to a lesser extent Southern Asia, tending to have less desirable values on most measures, while Northern America and Europe, Eastern Asia, and Oceania tend to perform better than the average. The exception to this is indicators related to sales of ultra-processed foods (though not shown in the figure, consumption of sugar-sweetened drinks and other foods and beverages that raise the risk for noncommunicable diseases also tends to be relatively high in Northern America and Europe and low in Southern Asia).

Environment, natural resources, and production indicators show a more mixed picture, with fewer consistent regional patterns. In general, each region has areas where it performs better and others where it performs worse. For example, Latin America and the Caribbean stands out for relatively low water use and more agricultural ecosystem function but also relatively high pesticide use—while the opposite is true for Southern Asia. Northern Africa and Western Asia also has very high relative levels of water use—but also relatively low food systems emissions. With regard to the efficiency of food production, Sub-Saharan Africa and Southern Asia tend to have relatively low yields, highlighting that agricultural productivity growth is still essential in these regions.

Within livelihoods, poverty, and equity, Northern America and Europe and Eastern Asia tend to have relatively desirable levels on most indicators, particularly the strength of their social protection programs. Oceania and Sub-Saharan Africa tend to have relatively undesirable levels for most indicators. Other regions have mixed results.

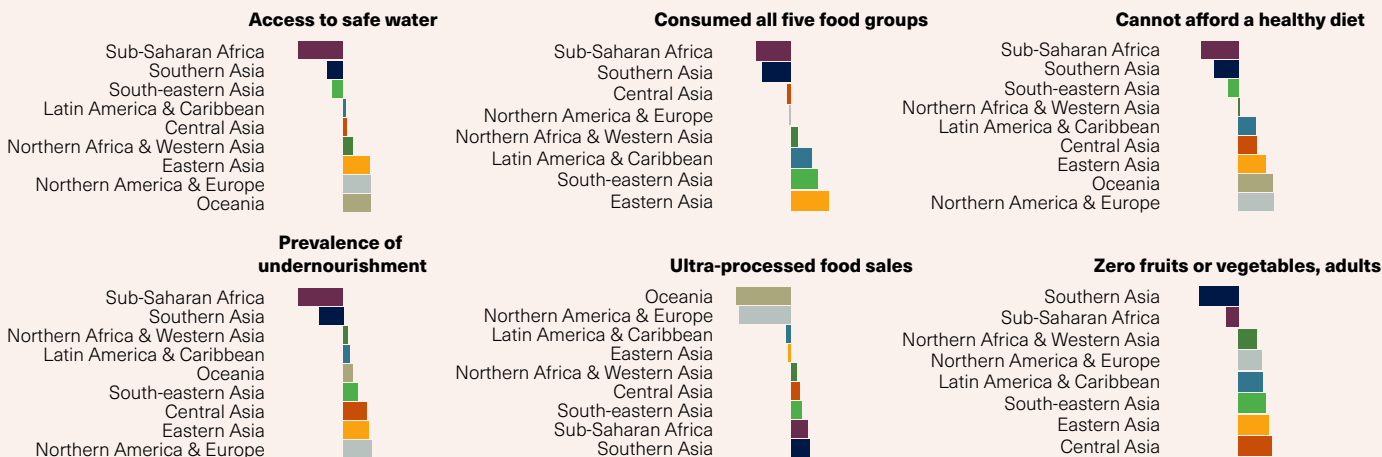
Figure 4 provides a similar depiction for selected Countdown cross-cutting theme indicators. For governance, Northern America and Europe again has generally better than average results—but also has the lowest share of countries with a national food system transformation pathway, suggesting an achievable regional priority for improvement. Northern Africa and Western Asia shows relatively undesirable governance indicator levels, while other regions' data paint a more mixed picture. Unlike in other domains, Eastern Asia tends to have average or lower than average levels for several indicators in this domain: improved governance could be its main area to focus on to improve food system performance.

Overall, Sub-Saharan Africa has relatively low resilience capacities, as captured in the figure by the Social Capital Index and the Dietary Sourcing Flexibility Index, while those of Northern America and Europe are relatively high. Central Asia, Latin America and the Caribbean, and Northern Africa and Western Asia have relatively lower desirability on indicators related to agricultural and food diversity, while Southern Asia performs comparatively better, particularly regarding conservation of animal genetic resources for food and agriculture.

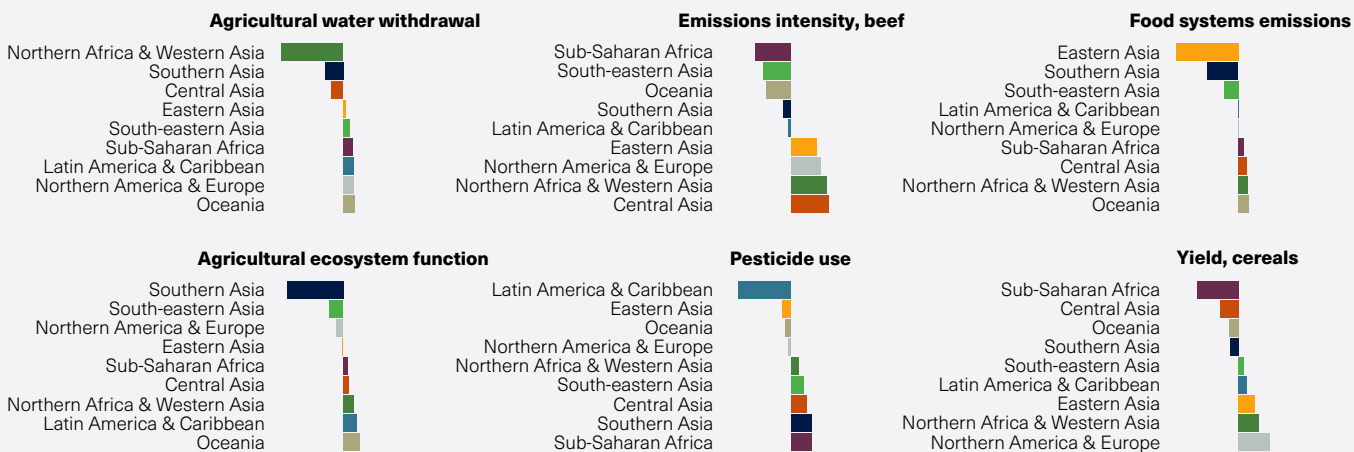
There are strong regional patterns in certain aspects of food systems, with clear inequalities: generally, Northern America and Europe and Eastern Asia have relatively more desirable status for most indicators relative to other regions, while Sub-Saharan Africa and Southern Asia have relatively less desirable status. These patterns suggest the potential value of regional collaboration on shared challenges. At the same time, there are exceptions to the patterns: every region shows both weaknesses and strengths, and many regions have countries that rank relatively well across many indicators.



Diets, nutrition, and health



Environment, natural resources, and production



Livelihoods, poverty, and equity

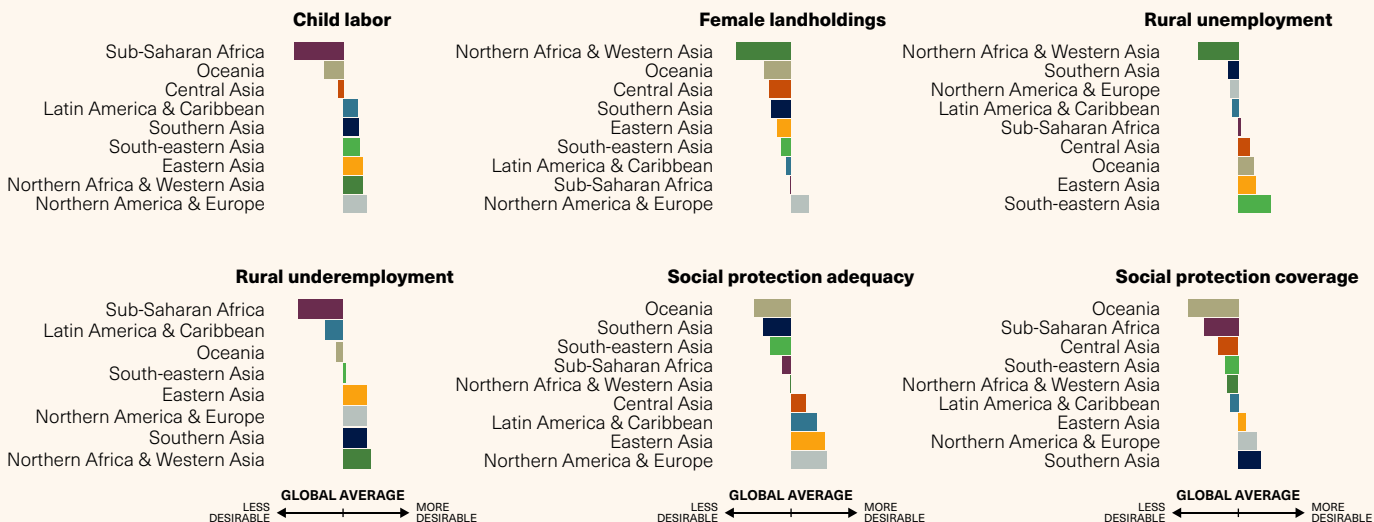


Figure 3. Regional patterns in select Countdown food system outcome indicators. Bars show regional deviation from the global average in either a more desirable (rightward) or less desirable (leftward) direction. The data in the figures are scaled to enable comparison of variables that have different units on a common scale. The direction of some indicators has been adjusted so that each indicator has the same direction of desirability.

Governance



Resilience

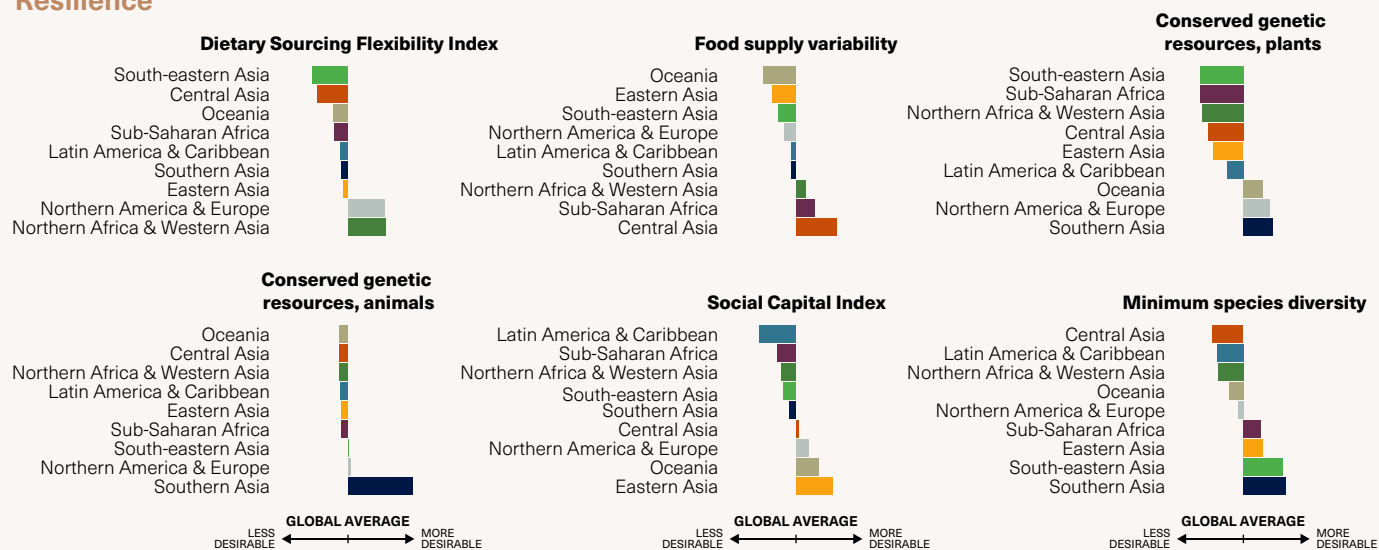


Figure 4. Regional patterns in select Countdown food system crosscutting indicators. Bars show regional deviation from the global average in either a more desirable (rightward) or less desirable (leftward) direction. The data in the figures are scaled to enable comparison of variables that have different units on a common scale. The direction of some indicators has been adjusted so that each indicator has the same direction of desirability.



There are serious gaps in the data available for monitoring food systems

The Countdown has assembled a comprehensive and cross-cutting set of food systems data. However, its work has also made it clear that there are many gaps in the data available to monitor food systems. The 50 indicators presented here represent just those that met criteria for having available data for a sufficient number of countries; numerous potentially relevant indicators were excluded because they did not meet this threshold. In particular, there are insufficient country-level data on food loss and waste—a contributor to environmental unsustainability as well as to food unaffordability and unavailability. Food production and supply indicators mostly omit aquatic and wild foods, and most environmental indicators focus on production, excluding not only loss and waste but also pollution from processes further down the value chain, like packaging waste. There are no data for the true cost of food (that is, estimates that include costs beyond the market price, like the cost of environmental damage or treating diet-related diseases) or for the overall economic value of food systems. Many gaps exist with respect to livelihoods, including data about who works in food systems, their productivity, and their welfare, such as gender equity and violations of human rights in food systems. Finally, with respect to food systems governance, data gaps include policy coherence (that is, the alignment of policies across topics and levels of government) for food systems transformation and

budgetary allocations to food systems. Some of these gaps will be filled with forthcoming SDG indicator data (see Box 1), but others remain to be addressed.

There are also gaps in the extent to which the chosen indicators have data available across all countries and over time. Indicators associated with agricultural development, such as yields, and environmental indicators tend to have data for many countries over a long period of time. However, other indicators have much sparser coverage. These include diet quality and biodiversity, as well as most livelihood and resilience indicators. Several indicators are newly developed, meaning that there are currently no historical data to use to analyze change over time—though this may improve as the Countdown compiles these data going forward if new observations become available.

Overall, Oceania is the region with the greatest scarcity in data, having very few diet quality indicators in particular. Several countries in the Northern Africa and Western Asia region also have low data availability. In general, countries with fewer indicators available are small island nations (such as Caribbean and Pacific islands), very small high-income countries (such as Brunei, Monaco, and Singapore), and countries recently experiencing conflict (such as Eritrea and Syria).

These critical data gaps must be filled to monitor the world's food systems and guide transformative action to support global goals.



Conclusions and future work

Food systems transformation is urgently needed to support sustainable development and human well-being. Data and analyses that are accurate, timely, trusted, and accessible can support informed action and accountability. The Countdown baseline data demonstrate several key conclusions:

- No country shows positive outcomes for all dimensions: across all levels of the income spectrum and all regions, there are opportunities for achievable food system transformation.
- Within each income group, there are countries that outperform their peers on some or all aspects of food systems, pointing to significant opportunities for cross-country learning.
- There are vast differences in performance for many indicators across countries and regions; it is urgent to transform food systems to be more equitable and better able to provide access to healthy diets, good livelihoods, and environmental sustainability for all.
- There are large data gaps when it comes to monitoring food systems. It is urgent for researchers and stakeholders to work together to prioritize and fill these gaps to improve our collective ability to implement and track food system transformation.

Going forward, the Countdown collaborators aim for the Countdown analyses to be used by food system stakeholders to assess the status of their food systems, decide where to act to accelerate improvements in outcomes, and hold one another accountable for change. By leveraging these data, they should be able to galvanize and focus support—from

government, business, and civil society—where it is most needed and sustain momentum in pursuing equitable and resilient food systems in which all have access to healthy, sustainable diets.

An annual Countdown policy report will be based on a related peer-reviewed scientific paper to ensure that all recommendations are evidence based. Future annual reports will analyze interactions among food systems domains and outcomes: it will be essential to make the most of scarce resources by identifying ways to maximize synergies and mitigate trade-offs. The Countdown collaborators will also identify indicator cutoffs that can be used to assess the performance of food systems around the world, thereby facilitating comparisons and learning across countries and accountability for progress. The collaborators aim to continuously make the Countdown work more useful for decision making by undertaking further analyses at regional, national, and subnational levels, working with key partners in each theme and at the country level, and to make the report more useful for the private sector, which is a key engine of food systems change. Finally, the Countdown will identify and prioritize gaps in indicators, data, and research to support food system transformation—hoping to inspire other researchers to help fill them and provide further guidance to decision makers across sectors.

As these baseline data make clear, the transformation of food systems remains an urgent priority—and there are many opportunities for making concrete progress toward positive outcomes through evidence-based actions. Guided by high-quality data and rigorous analysis, such progress can yield more equitable food systems that enable sustainable human and planetary health and well-being.

REFERENCES

1. J. Fanzo et al., “Viewpoint: Rigorous Monitoring Is Necessary to Guide Food System Transformation in the Countdown to the 2030 Global Goals,” *Food Policy* 104 (October 2021): 102163.
2. 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, 2023), <http://www.fao.org/documents/card/en/c/cc4337en>, doi:10.4060/cc4337en.
3. Food and Agriculture Organization of the United Nations (FAO), International Fund for Agricultural Development (IFAD), United Nations Children’s Fund (UNICEF), World Food Programme (WFP), and World Health Organization (WHO), *The State of Food Security and Nutrition in the World 2023: Urbanization, Agrifood Systems Transformation and Healthy Diets across the Rural-Urban Continuum* (Rome, 2023), doi:10.4060/cc3017en.
4. A. H. Havelaar et al., “World Health Organization Global Estimates and Regional Comparisons of the Burden of Foodborne Disease in 2010,” *PLOS Medicine* 12 (2015): e1001923.
5. FAO, *Land Statistics and Indicators 2000–2021: Global, Regional, and Country Trends*, FAOSTAT Analytical Briefs Series No. 71 (Rome, 2023), <http://www.fao.org/documents/card/en/c/cc6907en> (2023) doi:10.4060/cc6907en.
6. FAO, *The State of the World’s Land and Water Resources for Food and Agriculture: Systems at Breaking Point: Synthesis Report 2021* (Rome: 2021), doi:10.4060/cb7654en.
7. M. Kummu et al., “Lost Food, Wasted Resources: Global Food Supply Chain Losses and Their Impacts on Freshwater, Cropland, and Fertiliser Use,” *Science of the Total Environment* 438 (2012): 477–489.
8. F. N. Tubiello et al., “Pre- and Post-Production Processes Increasingly Dominate Greenhouse Gas Emissions from Agri-Food Systems,” *Earth System Science Data* 14 (2022): 1795–1809.
9. High Level Panel of Experts on Food Security and Nutrition (HLPE), Committee on World Food Security, *Nutrition and Food Systems* (Rome, 2017).

