

# **Global Food System Index**

## **Concept Note**

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initiative  
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## Global Food System Index Concept Note

### Overview

A food system that provides food security and nutrition in a productive, inclusive, climate-smart, sustainable, nutrition-sensitive, and business-friendly way is essential to promote and maintain the well-being of all people and of the planet.<sup>1</sup> Such a food system will be key to achieve multiple Sustainable Development Goals (SDGs). For these reasons, a global food system index is critical to monitor and track progress toward a desired food system.

By providing decision makers with a broad and practical tracking and monitoring tool, a global food system index would support the World Economic Forum's Global Agenda Council on Food and Nutrition Security mandate of ensuring sustainable food and nutrition security for all. The global food system index will aim to fill a niche among a crowded field of indexes and indicators; while many indexes exist, none distills the complexities of the entire food system into a single index or set of indexes.

The global food systems index will be developed and disseminated to help users prioritize investments in food systems, assess the policy and institutional support for climate smart practices and sustainable systems, and track the development impacts of food systems (among other uses). Users of such an index may come from various sectors and spheres, including decision makers in governments, international organizations, the private sector, donor agencies, civil society, and academia.

Drawing from the UN Secretary General's Zero Hunger Challenge, a food system is defined as a system that "embraces all elements (environment, people, inputs, processes, infrastructure, institutions, et cetera) and activities that relate to the production, processing, distribution, preparation, and consumption of food and the outputs of these activities, including socio-economic and environmental outcomes." Understanding the many moving parts of a food system requires a tool; in this case, an index.

### Proposed components and indicators

An ideal global food system would successfully address challenges to human and ecological well-being across all of its aspects. To track progress toward such a system, a global food system index would cover six key dimensions: Productive, inclusive, nutritious and healthy, climate-smart, sustainable, and business-friendly.

#### *Productive*

A productive food system is one that produces crops, livestock, and fisheries efficiently. The global food system must be productive as the current global population will increase to 9 billion

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<sup>1</sup> Food security, defined by the Food and Agriculture Organization (FAO), exists when "all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life" (Source: FAO SOFI 2011), together with the observation that the four pillars of food security are availability, access, utilization and stability, with the nutritional dimension being integral to the concept of food security.

<http://www.fao.org/docrep/meeting/026/MD776E.pdf>

by 2050. By then, per capita arable land will decrease by 50%, while food production will need to increase by 60% to meet demand.

The productivity dimension will measure the efficiency of staple crop production in a country. It will also include investments in agricultural R&D that are critical to drive agricultural productivity. Further, as not all countries have the same yield potential for each crop, an indicator of yield gaps for selected crops will be considered to measure how close each country is to achieving their potential in productivity.

Candidate indicators for *Productive* dimension

Sub-component	Indicator	Data source	Frequency of data (most recent year)
Staple crop productivity	Average yields of cereals and pulses	FAO	Annual (2013)
Driver of productivity	Public expenditure on agricultural R&D	ASTI	Occasional (2011)
Potential for productivity	Yield gaps	IFPRI	

*Inclusive*

A desired food system must be inclusive, particularly of smallholders and women, as such groups will be critical in meeting emerging demand and providing safe, adequate, and nutritious foods for their households. Yet these groups face constrained access to assets and markets and are at risk of exclusion from increasingly complex food value chains. Maximizing the potential of smallholder farms, empowering women are not only critical for food security and nutrition, they are also necessary to achieve several other SDGs, particularly those related to reducing inequalities.

Potential indicators for an inclusive food system include women’s empowerment in relevant domains and intrahousehold gender parity. To measure inclusion of smallholders, an indicator on land tenure security and access to financial services and markets will be considered.

Candidate indicators for *Inclusive* dimension

Sub-component	Indicator	Data source	Frequency of data (most recent year)
Women’s empowerment	Women’s empowerment in 5 domains	WEIA	Every 2-3 years (2013)
	Intrahousehold gender parity	WEIA	Every 2-3 years (2013)
	Land tenure security for smallholders	To be Created <sup>2</sup>	

<sup>2</sup> There is no global, nationally-representative, sex-disaggregated data on tenure security. However, the Post-2015 SDGs offer a promising opportunity through the inclusion of a cross-cutting land rights indicator. In the short-term, this critical data void can be filled using a global poll until national-level household surveys are implemented. For more information on a path forward supported by a coalition of over 20 civil society organizations see: <http://landpost2015.landesa.org/wp-content/uploads/2015/04/One-Indicator-Many-Targets-A-Path-for-Tracking-Land-Rights-Post-2015.pdf>

Market inclusion of smallholders	Rural access to credit	World Bank (Agribusiness indicators)	
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### *Nutritious and healthy*

Undernutrition is the single biggest contributor to child mortality, and one of the world's most serious health and human development challenges. Although the overall trend for undernutrition is improving, there are still 162 million children under-five who are stunted, the vast majority of whom live in Sub-Saharan Africa and South Asia. Worldwide an estimated two billion people suffer micronutrient deficiencies. Consequences of undernutrition extend beyond individual health outcomes. The impaired cognitive and physical development that results hinders educational attainment, and workforce capacity and productivity, ultimately undermining the economic progress of countries.

On the other end of the spectrum, a growing number of people are suffering from overnutrition; currently over 2 billion people are overweight or obese. Physical, social, and economic consequences of overnutrition are experienced in nearly every country in the world. Further, food safety is under threat from rising agriculture-related risks to health and increased threats to the safety of food supplies in countries of all stages of modernization and intensification of industrial and agricultural activities (consider rice contamination in China and aflatoxin in maize in Africa, for example). Concerted efforts are needed to align the global food system to enable/promote increased consumption of safe, nutritious, diverse diets in amounts adequate to meet food-based dietary recommendations while limiting processed foods of limited or no nutrition value.

Indicators to measure the nutritional aspect of the food system include the extent to which diverse foods are consumed, as well as average overall food supply. New indicators on dietary diversity, particularly those that are aligned with the post-2015 development framework, will be considered as they are rolled out. An indicator on governmental commitment to nutrition plans will be considered. To measure food safety, an indicator of incidents of agriculture-related disease by country will be considered, as well as the existence of an agency or body to ensure the safety and health of food.

### Candidate indicators for *Nutritious and Healthy* dimension

Sub-component	Indicator	Data source	Frequency of data (most recent year)
Nutrition	Dietary diversity score	FAO	2011
	Average food supply	FAO	2011
	Nutrition plan or strategy	HANCI	2014
Health	Food safety	IFPRI	
	Agency to ensure the safety and health of food	HANCI	2014

### *Climate-smart*

In the global food system, the agriculture sector is by far the main contributor of greenhouse gas emissions (GHGs) and to ongoing climate change. A climate-smart food system is one that integrates agricultural development and climate responsiveness, and aims to reduce/remove

GHGs and build resilience. A climate-smart approach is essential, as significant crop yield impacts are already being felt at current levels of warming. As temperatures rise, climate change will add further pressure on agricultural systems across regions. For example, 2°C warming by 2050 is projected to reduce wheat yields by up to 50 percent in Tunisia, Brazil, and Central America and the Caribbean.

The World Bank’s Climate Smart Agriculture (CSA) indicators will form the basis for the food systems index climate smart dimension. They revolve around adoption of CSA technologies and policies, as well as outcome indicators that measure the results of CSA adoption.

Candidate indicators for *Climate-smart* dimension

Sub-component	Indicator	Data source	Frequency of data (most recent year)
Climate-smart agriculture	Policies and institutions	World Bank	
	Technologies	World Bank	
	Results of CSA adoption	World Bank	

*Sustainable*

Sustainability of a food system is defined here in terms of efficient resource use, efficiency in the supply chain, and the resilience to maintain that efficiency in the face of shocks. A sustainable food system is one that efficiently meets current and emerging demand for food without jeopardize the availability of scarce resources and while minimizing food losses and waste. The sustainability of the food system over time also depends on its resilience, or the ability to prevent, prepare for, cope with, and recover from shocks and not only bounce back to the level of efficiency before the shocks occurred, but become even better-off. Sustainability in terms of environmental and ecological footprints is discussed under the header of climate-smart.

Sustainability is particularly crucial as competition for land, energy, and water is growing—for example, agriculture’s demand for water could rise by over 30% by 2030 as availability shrinks. Mid- and downstream aspects of the value chain must also contribute to resource-use efficiency by reducing food losses and waste, as one-third of food produces for human consumption is lost or wasted globally—a figure that points to an inefficient and unsustainable global food system..

Indicators within the sustainability dimension will include resource use efficiency in agriculture with respect to water and energy use. An indicator on the agriculture sector’s impact on biodiversity and land degradation will also be considered. An indicator on food losses and food waste will also be included.

Candidate indicators for *Sustainable* dimension

Sub-component	Indicator	Data source	Frequency of data (most recent year)
Resource use efficiency in agriculture	Water productivity		
	Energy use efficiency		
Food losses and waste	Food loss	FAO	2011
	Food waste	FAO	2011

### *Business-friendly*

A food system that is business-friendly is one that promotes long-term, market-based solutions while being well integrated into increasingly interconnected global markets. The global food system must also be business-friendly to encourage private sector participation as well as foreign and domestic investments, which can result in critical advances. Understanding the business-friendliness of a food system can help guide stakeholders in exploring opportunities to integrate collaborative agriculture into the core business of corporations and into partnerships with public bodies, development agencies, and civil society organizations.

To measure the interconnectedness of a country's food system to global markets, an indicator that captures measures of trade of agricultural products will be included. Indicators examining policies that promote enabling environments for local and foreign investment along the value chain will be included. Indicators that measure how a country's rule of law is experienced—and in particular how it impacts the enabling environment for agribusiness—will also be considered.

#### Candidate indicators for *Business-friendly* dimension

<b>Sub-component</b>	<b>Indicator</b>	<b>Data source</b>	<b>Frequency of data (most recent year)</b>
Open, fair, transparent trade	Agricultural import tariffs	WTO	Annual (2010-13)
Enabling environment for business	Presence of formal grocery sector	EIU	Annual (2009-15)

### **Limitations of existing indexes related to the food system**

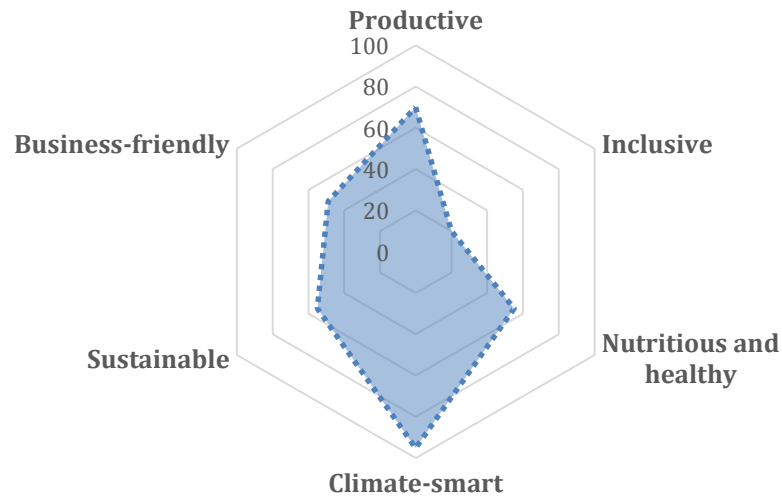
Many indexes and indicators exist that can assess certain aspects of a country's vulnerability of their food systems and their progress in achieving food security and nutrition. An overview of these and other indexes are found in the table below, which will be supplemented to include a mapping of existing indices against criteria such as validity and transparency of methods and data collection, relevance, frequency and continuity of data collection, and coverage. While these indexes are useful, they have their limitations. Firstly, new indexes often simply reorganize existing data. Although their designs and methods may be sound, little is gained if the quality, accuracy, and timeliness of the underlying data are poor. Generating new data or updating data more often could help improve the relevance and utility of all indexes.

Other problems relate to how indexes are constructed. Distortions can arise if an index integrates several indicators that are driven by the same underlying factors, such as income. For instance, low agricultural prices may strengthen consumers' food security but harm that of producers who are net-sellers. Additionally, many indexes are not holistic in their approach and instead tend to focus on particular aspects of the food system. While this may be a strength for monitoring certain issues in depth, our goal of establishing a global food system index or set of indexes requires a broad approach.

### **A way forward**

Creating a global food system index could improve tracking and monitoring of countries' progress toward a desired food system. Given the cursory exploration of existing indices, such an index would add value to those interested in a holistic measure of the status and progress of a country's food system in an easy to understand fashion (see Figure, which depicts the status of a hypothetical food system for country). No such index exists, and we can work toward filling this niche for tracking food systems, particularly against development goals such as the upcoming SDGs.

**Figure:** Example depiction of food system index covering six key dimensions



There are possible approaches to construct such an index. While it is appealing to aggregate all six dimensions into a grand index for the sake of simplicity, generating a system of sub-indices or indicators (i.e. a “dashboard” approach”) may be preferred. Doing so will offer an accessible snapshot of a country's food system while allowing for a more nuanced look into each dimension.

Already, many existing indicators explicitly draw from each other by incorporating elements of indexes or entire indexes into their own index. Indicators that have already been used and validated by other organizations will be considered first to avoid duplication of effort. An exercise to further map potential indicators against existing indicators and indexes is being undertaken. The exercise will also help the global food system index position itself to fill gaps and complement other indexes that offer non-food system insights.

The selection of indicators will in large part depend on data availability and frequency and coverage of data collection. Indicator selection and data collection for the global food system index will be aligned with and learn from other initiatives, including the SDG data gathering initiative. Further, the index will be a flexible tool that will evolve with the evidence base by incorporating the latest data and new indicators as they become available.

Ultimately, to improve the measurement toward a desired food system, efforts and resources must also be concentrated on supporting an index that integrates new and timely data for each of the six dimensions of the food system. Ongoing efforts to develop statistical capacity and generate new data in developing countries should be leveraged.

**Table:** Selected indexes and indicators related to the global food system

Index/Indicator	Org	Description	# of indicators	Countries covered	Overlap with Global Food System Index components					
					Productive	Inclusive	Nutritious	Climate-smart	Sustainable	Business-friendly
<a href="#">The Global Food Security Index (GFSI)</a>	DuPont and EIU	Assesses country-level food insecurity by affordability, availability, and quality	28	109	x		x		x	x
<a href="#">Global Hunger Index (GHI)</a>	IFPRI	Measures and tracks hunger and nutrition insecurity globally, by region, and by country	3	120			x			
<a href="#">Rice Bowl Index</a>	Syngenta	Detects country-level price shock vulnerability	33	14	x				x	x
<a href="#">The Nutrition Barometer</a>	World Vision	Assesses govs political, legal, and financial commitments to ending undernutrition	13	36			x			
<a href="#">Hunger Reduction Commitment Index</a>	IDS	Assess political commitments, transparency, and accountability, and their links to hunger and undernutrition reduction	22	45		x	x			
Food Security Risk Index	Maple-croft	Assess risk from lack of access to basic staples	18							
<a href="#">Food Security Vulnerability Indices</a>	IFPRI	Detects country-level price shock vulnerability					x			x
<a href="#">Women's Empowerment in Agriculture Index</a>	IFPRI, UASID, OPHI	Track change in women's empowerment levels; performance monitoring and impact evaluations	6	13-19		x				
Climate Smart Agriculture (CSA) Indicators	World Bank	Assesses readiness mechanisms and helps countries mainstream climate smart agriculture in development	13	88				x		
<a href="#">Agricultural Science and Technology Indicators (ASTI)</a>	IFPRI	Provides data and analysis on ag R&D systems		70	x	x				
<a href="#">Access to Nutrition Index (ATNI)</a>	Access to Nutrition	Assesses world's largest food and bev manufacturers on nutrition-related commitments, practices and performance	5	3						x



<a href="#">Bertelsmann Stiftung Transformation Index (BTI)</a>	Bertelsmann Stiftung	Measures quality of democracy, a market economy and political management	49	129						
<a href="#">Global Gender Gap Index</a>	WEF	Measures gender gaps across health, education, economy and politics	14	142						
<a href="#">Gender Inequality Index</a>	UNDP	Measures gender inequalities in reproductive health; empowerment; and economic status	7	187		x				
<a href="#">Human Development Index (HDI)</a>	UNDP	Measures average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living.	4	187						
<a href="#">FAO Food Security Suite of Indicators</a>	FAO	Aims to capture various aspects of food insecurity including availability, access, stability, and utilization	43	153			x			
<a href="#">Agribusiness indicators</a>	World Bank	Aims to measure progress toward productive, modern, and market-oriented farming sectors	44 - 54	9 (80 planned)	x					x