Last updated: March 2020  
  
  
  
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture  
  
Target 2.b: Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round  
  
Indicator 2.b.1: Agricultural export subsidies  
  
  
  
Institutional information  
  
  
  
Organization(s):  
  
  
  
The World Trade Organization (WTO)  
  
  
  
Concepts and definitions  
  
  
  
Definition:  
  
  
  
Agricultural export subsidies are defined as export subsidies budgetary outlays and quantities as notified by WTO Members in Tables ES:1 and supporting Tables ES:2 (following templates in document G/AG/2 dated 30 June 1995).  
  
  
  
Data cover:  
  
• Notifications by WTO Members with export subsidy reduction commitments included in part IV of their Schedules;  
  
• Notifications of export subsidies by developing country Members pursuant to the provisions of article 9.4 of the Agreement on Agriculture.  
  
  
  
Other WTO Members are not entitled to use export subsidies and their notifications are therefore not recorded in the indicator series.  
  
  
  
Budgetary outlays and quantities are expressed in a currency (national or other) and in quantity units as per Member's notification practices. For Members with export subsidy reduction commitments included in part IV of their Schedules, the currency used in the notifications is similar to the one used in the Schedules.  
  
  
  
Data are available by country and by products or groups of products, according to Members' schedules for Members with export subsidy reduction commitments included in part IV of their Schedules and according to Member's notification practices in the case of developing country Members using export subsidies under the provisions of article 9.4 of the Agreement on Agriculture."  
  
  
  
Rationale:  
  
  
  
The purpose of this indicator is to give detailed information on the level of export subsidies applied annually per product or group of products, as notified by WTO Members.  
  
  
  
Comments and limitations:  
  
  
  
The quality of the indicator depends on WTO Members' timeliness and accuracy of their notifications.  
  
  
  
Methodology  
  
  
  
Computation Method:  
  
  
  
The country level data come directly from Members' notifications to the WTO and are not subject to any computation by the WTO. Each WTO Member collects data following his own national practice to prepare his notification.  
  
  
  
Disaggregation:  
  
  
  
The indicator gives country and product based information on the level of applied export subsidies, both in terms of budgetary outlays and quantities.  
  
  
  
Treatment of missing values:  
  
  
  
At country level  
  
  
  
Values are missing when a WTO Member has not submitted their notification. Missing values cannot be estimated.  
  
  
  
At regional and global levels  
  
  
  
Not relevant.   
  
  
  
Regional aggregates:  
  
  
  
The WTO does not calculate regional aggregates.  
  
  
  
An overall global indicator measuring the total annual applied export subsidies budgetary outlays is calculated by summing all the available data after having converted them into a single currency (US$).  
  
  
  
Sources of discrepancies:  
  
  
  
The WTO does not estimate data. Only data contained in WTO Members' notifications are used. Therefore, there is no difference between country produced data and data available at the WTO.  
  
  
  
Data Sources  
  
  
  
Description:  
  
  
  
The sources of data are WTO Members' notifications in their Table ES:1 and supporting table ES:2 notifications, pursuant to the notification requirements and formats adopted by the WTO Committee on Agriculture and contained in document G/AG/2.  
  
  
  
Collection process:  
  
  
  
Not relevant. Cf. previous replies  
  
  
  
Data Availability  
  
  
  
Description:  
  
  
  
Cf. latest revision of WTO document series G/AG/GEN/86 (table under section 2.4 – Members with shaded cells) for a detailed description of data availability for export subsidies notified by Members with export subsidy reduction commitments.  
  
  
  
In addition, 10 developing country Members notified since 1995 the use of export subsidies, pursuant to the provisions of article 9.4 of the Agreement on Agriculture.  
  
  
  
Contrary to the information for developed country Members with export subsidy reduction commitments that is available for all notified years, information for developing country Members using export subsidies, pursuant to the provisions of article 9.4 of the Agreement on Agriculture is available only for the years during which these export subsidies were used.  
  
  
  
Time series:  
  
  
  
Since 1995   
  
  
  
Calendar  
  
  
  
Data collection:  
  
  
  
Data are collected on a regular basis, following the timing of WTO Members' notification submissions.   
  
  
  
Data release:  
  
  
  
Cf. above   
  
  
  
Data providers  
  
  
  
WTO Members  
  
  
  
Data compilers  
  
  
  
Name:  
  
  
  
WTO  
  
  
  
Description:  
  
  
  
The WTO is receiving WTO Members notifications and compiling the information contained in these notifications to report on this indicator.  
  
  
  
References  
  
  
  
URL:  
  
  
  
www.wto.org  
  
  
  
References:  
  
  
  
http://agims.wto.org/Pages/ES/ESSearchAnalyse.aspx?ReportId=1403&Reset=True  
  
  
  
https://www.wto.org/english/tratop\_e/agric\_e/transparency\_toolkit\_e.htm

Last updated: 16 October 2018  
  
  
  
  
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture  
  
Target 2.3: By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment  
  
Indicator 2.3.1: Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size  
  
  
  
Institutional information  
  
  
  
Organization(s):  
  
Food and Agriculture Organization (FAO)  
  
  
  
Concepts and definitions  
  
  
  
Definition:  
  
Volume of agricultural production of small-scale food producer in crop, livestock, fisheries, and forestry activities per number of days.  
  
  
  
The indicator is computed as a ratio of annual output to the number of working days in one year.   
  
  
  
FAO proposes to define small-scale food producers as producers who:   
  
operate an amount of land falling in the first two quintiles (the bottom 40 percent) of the cumulative distribution of land size at national level (measured in hectares); and   
  
operate a number of livestock falling in the first two quintiles (the bottom 40 percent) of the cumulative distribution of the number of livestock per production unit at national level (measured in Tropical Livestock Units – TLUs); and   
  
obtain an annual economic revenue from agricultural activities falling in the first two quintiles (the bottom 40 percent) of the cumulative distribution of economic revenues from agricultural activities per production unit at national level (measured in Purchasing Power Parity Dollars) not exceeding 34,387 Purchasing Power Parity Dollars.  
  
  
  
Rationale:  
  
The 2030 Sustainable Development Agenda has emphasized the importance of enhancing productivity of small-scale food producers, as these producers play an important role in the global production of food. The indicator monitors progress in this area, where the target is to double productivity by year 2030.   
  
The enhancement of labour productivity in small-scale production units also has implications on poverty reduction, as small-scale food producers are often poor, and are frequently found to be close to subsistence conditions.  
  
  
  
Concepts:  
  
The following concepts are adopted for the computation of indicators 2.3.1:  
  
Small-scale food producers are defined as those falling in the intersection of the bottom 40 percent of the cumulative distribution of land, livestock and revenues.  
  
Tropical Livestock Units are a conversion scale used for standardization and measurement of the number of livestock heads. One TLU is the metabolic weight equivalent of one cattle in North America. The complete list of conversion factors can be found in the Guidelines for the preparation of livestock sector Reviews   
  
The concept of productivity is standardized by OECD’s Manual for Measuring Productivity. This defines productivity as “a ratio of a volume measure of outputs to a volume measure of input use.” More information on possible definitions can be found in “Productivity and Efficiency Measurement in Agriculture: Literature Review and Gaps Analysis”.  
  
  
  
Comments and limitations:  
  
A major limitation is data availability. In reality, surveys collecting all the required information simultaneously at the farm level are very few. The most appropriate data source for collecting information on total volume of agricultural production and on labour input adopted on the agricultural holding would be agricultural surveys. However, in many countries, especially in a developing context, agricultural surveys are seldom conducted.  
  
  
  
Methodology  
  
  
  
Computation Method:  
  
  
  
  
  
where:   
  
 is the physical volume of agricultural product i sold by the small-scale food producer j during year t;   
  
 is the constant sale price received by the small-scale food producer j for the agricultural product i during same year t;   
  
 is the number of labour days utilized by the small-scale food producer j during year t;   
  
is the number of small-scale food producer.   
  
  
  
As the indicator is referred to a set of production units – those of a small scale — the denominator needs to summarize information on the entire production undertaken in each unit. This requires that volumes of production are reported in a common numeraire, given that it is impossible to sum up physical units. The most convenient numeraire for aggregating products in the numerator is a vector of constant prices. When measured at different points in time, as required by the monitoring of the SDG indicators, changes in constant values represent aggregated volume changes.   
  
  
  
Disaggregation:  
  
Indicator 2.3.1 must be disaggregated by classes of farming/pastoral/forestry enterprise size. The overall SDG Target 2.3 requires specific focus on women, indigenous peoples, family farmers, pastoralists and fishers. For this reason, the indicator must be disaggregated by sex, type of enterprise and by community of reference.  
  
  
  
Treatment of missing values:  
  
  
  
At country level  
  
To be determined.  
  
  
  
At regional and global levels  
  
To be determined.  
  
  
  
Regional aggregates:  
  
Not yet applicable.  
  
  
  
Sources of discrepancies:  
  
Not yet applicable.  
  
  
  
Methods and guidance available to countries for the compilation of the data at the national level:  
  
Information is currently not available.  
  
  
  
Quality assurance  
  
Information is currently not available.  
  
  
  
Data Sources  
  
  
  
Sources and collection process:  
  
Given that indicator 2.3.1 is measured on a target population of producers – those considered as small-scale – the ideal data source for measuring them is a single survey that collects all the information required with reference to individual production units. The most appropriate data source for collecting information on total volume of agricultural production and on labour input adopted on the agricultural holding would be agricultural surveys. Other possibilities to be explored in absence of an agricultural surveys are:   
  
household surveys integrated with an agricultural module,   
  
agricultural censuses,   
  
administrative data.  
  
  
  
Data Availability  
  
  
  
Data is still not available in a systematic and harmonized fashion. The following data availability information is provided based on available suitable surveys in selected countries.   
  
  
  
Breakdown of the number of countries covered by region is as follows:  
  
  
  
Number of countries  
  
Nature of data  
  
World  
  
8  
  
E  
  
Africa  
  
7  
  
E  
  
Northern Africa  
  
  
  
  
  
Sub-Saharan Africa  
  
  
  
  
  
Eastern Africa  
  
4  
  
E  
  
Middle Africa  
  
  
  
  
  
Southern Africa  
  
  
  
  
  
Western Africa  
  
3  
  
E  
  
Americas  
  
  
  
  
  
Latin America and the Caribbean  
  
  
  
  
  
Caribbean  
  
  
  
  
  
Latin America  
  
  
  
  
  
Northern America  
  
  
  
  
  
Asia  
  
1  
  
E  
  
Central Asia  
  
  
  
  
  
Eastern Asia  
  
  
  
  
  
Southern Asia  
  
1  
  
E  
  
South-Eastern Asia  
  
  
  
  
  
Western Asia  
  
  
  
  
  
Europe  
  
  
  
  
  
Eastern Europe  
  
  
  
  
  
Northern Europe  
  
  
  
  
  
Southern Europe  
  
  
  
  
  
Western Europe  
  
  
  
  
  
Oceania  
  
  
  
  
  
Australia and New Zealand  
  
  
  
  
  
Melanesia  
  
  
  
  
  
Micronesia  
  
  
  
  
  
Polynesia  
  
  
  
  
  
  
  
Time series:  
  
By 2030.  
  
  
  
Calendar  
  
  
  
Data collection:  
  
 To be determined.  
  
   
  
Data release:  
  
To be determined.  
  
  
  
Data providers  
  
National Statistical Offices  
  
  
  
Data compilers  
  
Food and Agricultural Organization of the United Nations  
  
  
  
References  
  
Note on “Proposed Methodology for Computing and Monitoring the sustainable Development Goal Indicator 2.3.1 and 2.3.2”, Office of the Chief Statistician and Statistics Division, FAO, Rome   
  
  
  
Defining Small Scale Food producers to Monitor Target 2.3 of the 2030 Agenda for Sustainable Development. FAO Statistics Division Working Paper available at http://www.fao.org/3/a-i6858e.pdf   
  
  
  
  
  
Related indicators as of February 2020  
  
Not applicable.

Last updated: 18 December 2018  
  
  
  
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture  
  
Target 2.c: Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility  
  
Indicator 2.c.1: Indicator of food price anomalies  
  
  
  
Institutional information  
  
  
  
Organization(s):  
  
  
  
Food and Agriculture Organization of the United Nations (FAO)  
  
  
  
Concepts and definitions  
  
  
  
Definition:  
  
The indicator of food price anomalies (IFPA) identifies markets prices that are abnormally high. The IFPA relies on a weighted compound growth rate that accounts for both within year and across year price growth. The indicator directly evaluates growth in prices over a particular month over many years, taking into account seasonality in agricultural markets and inflation, allowing to answer the question of whether or not a change in price is abnormal for any particular period.  
  
  
  
  
  
Rationale:  
  
The thresholds for the are expressed as the normalized difference of the compound growth rate of prices from their historical mean for the predefined period of time. And three ranges are established: 1) a less than half a standard deviation difference from the mean is considered normal; 2) a difference that is half but less than one standard deviation is considered moderately high; 3) a difference from the historical mean that is at least one standard deviation greater than the mean is considered abnormally high.   
  
  
  
  
  
  
  
We use one standard deviation as the relevant threshold since we want to minimize the probability of missing a significant market event. Events that deviate by more than one standard deviation from their historical distribution have a low probability of occurring and thus are easier to identify as abnormally high prices.  
  
  
  
  
  
Concepts:  
  
The indicator of price anomalies (IFPA) relies on two compound growth rates (CGR’s), a quarterly compound growth rate (CQGR) and an annual compound growth rate (CAGR). A CGR is a geometric mean that assumes that a random variable grows at a steady rate, compounded over a specific period of time. Because it assumes a steady rate of growth the CGR smoothes the effect of volatility of price changes. The CGR is the growth in any random variable from time period to , raised to the power of one over the length of the period of time being considered  
  
  
  
 (1)  
  
Where:  
  
 is the quarterly or annual compound growth rate in month t  
  
is the price at the beginning of the period  
  
 is the price at the end of the period,   
  
 is the time in months between periods and .  
  
The quarterly and annual indicators of food price anomalies are then defined as:  
  
 (2)  
  
Where:  
  
 is either the quarterly or annual compound growth rate in month t for year y  
  
 is the weighted average of either the quarterly or annual compound growth rate for month t across years y  
  
 is the weighted standard deviation of either the quarterly or annual compound growth rate for month t over years y,   
  
 is either the quarterly or annual indicator of a price anomaly.   
  
  
  
  
  
Comments and limitations:  
  
It is appropriate to caution the reader that the indicator is just a guide to understanding market dynamics. As such, one cannot rely on it as the sole element to determine whether a food price in a particular market at a given time is abnormally high or low due to the direct effects of local policies. Results must be weighed with other available information on market fundamentals, macroeconomic context and external shocks.   
  
  
  
  
  
Methodology  
  
  
  
Computation Method:  
  
Mathematically the IFPA for a particular year in month is calculated as the weighted sum of the quarterly indicator of food price anomalies ), and the annual indicator of food price anomalies as stated in equation 1.  
  
  
  
 (3)  
  
Where:   
  
 is the indicator of food price anomalies in year and month   
  
 is the quarterly indicator of food price anomalies in year and month   
  
 is the annual indicator of food price anomalies in year and month   
  
 is a weight with a value of 0.4.  
  
  
  
The weight establishes the relative importance of quarterly () anomalies to the year-on-year price variations (. The weight is set to 0.4, giving a weight of 0.6---- to abnormal price growth from year-to-year. This is done to better capture the price level relative to its seasonal trends, which is measured to the price level a year earlier. SDG indicator 2.c.1 is then calculated as the arithmetic mean over months of the  
  
 as follows:  
  
  
  
 (4)  
  
Where:   
  
 is the annual indicator of food price anomalies in year   
  
 is the indicator of food price anomalies in year and month   
  
 is the number of months in a year  
  
  
  
Disaggregation:  
  
The and it’s subcomponents.   
  
  
  
  
  
Treatment of missing values:  
  
At country level  
  
  
  
 For the domestic food commodity prices, the data is republished data harvested from national governmental organizations without imputation of missing values. For the purpose of the indicator, if more than 3 consecutive months of data are missing the series may be dropped from monitoring.  
  
  
  
  
  
For the food price index in FAOSTAT, the data is republished data harvested from other international organizations without imputation of missing values.  
  
At regional and global levels  
  
Not Applicable  
  
  
  
Sources of discrepancies:  
  
FAO relies on the Food Price Indices as reported in FAOSTAT as well as on available official domestic food price data that it compiles in the Food Price Monitoring and Analysis (FPMA) tool to calculate the indicator. The FPMA database brings together price series for main food commodities (mainly cereal products) in selected markets in countries around the world. As a result, the indicator estimated by FAO can differ from the indicator estimated at country level, as it may be calculated on prices for a different market or commodity.   
  
  
  
  
  
Methods and guidance available to countries for the compilation of the data at the national level:  
  
An interactive e-learning course is available on SDG Indicator 2.c.1 – Food price anomalies to complement countries’ efforts in monitoring the 2030 Agenda and broaden the subject’s understanding. The course covers basic concepts related to market functioning, prices determination and price volatility and explains how to calculate the indicator and use the online Food Price Monitoring and Analysis (FPMA) tool to interpret indicator results, at national and international level. Besides in English, the online version of this course is also available in Russian, French and Spanish.  
  
  
  
Quality assurance  
  
The indicator is calculated on food price data, which is gathered from official sources, same as for the food price index published in FAOSTAT. To ensure the correct calculation of the indicator, the process for the calculation of the indicator relies on a computerized system.   
  
On request, countries are supported by FAO to implement the indicator and interpret the results. In addition, training is provided in the country upon request.   
  
  
  
Global and regional estimates:  
  
Results are organized on a regional basis but are not aggregated as such. This is because the commodities and food baskets monitored across countries are not sufficiently homogenous to aggregate into one price index. However, if a majority of countries within a region presents abnormally high prices, either for a particular commodity or the food price index, this region is quantified as a region suffering from abnormally high levels of price volatility. Similarly at the global level the number of regions presenting high levels of price volatility are quantified.   
  
  
  
Obtaining internationally comparable data for global monitoring:  
  
Not applicable.  
  
  
  
Data Sources  
  
  
  
FAO relies on official domestic price data that it compiles in the Food Price Monitoring and Analysis (FPMA) tool to calculate and monitor the indicator. Five cereal products will be monitored: maize & maize products, wheat & wheat flour, rice, sorghum and millet. While diets across the world have become more diversified with increasing incomes, cereals still account for 45 percent of a person’s daily caloric intake, making this commodity group the most important in terms of its contribution to caloric intake, particularly for low income populations (FAOSTAT, 2017). For the purpose of a more comprehensive coverage at the global level, FAO also calculates IFPA on countries’ officially reported food price indices as reported in FAOSTAT, which facilitates cross country comparisons as it uses a national level food basket covering all the most important commodities consumed. While the basket differs from country to country, this approach is more reflective of national and global trends as countries have predefined the commodities that have the most impact on local consumers. This approach also facilitates the implementation of the indicator as countries will not be asked to create a new index or modify existing methodologies.  
  
  
  
For the Food CPI, the FAOSTAT monthly CPI & Food CPI database was based on the ILO CPI data until December 2014. In 2014, IMF-ILO-FAO agreed to transfer global CPI data compilation from ILO to IMF. Upon agreement, CPIs for all items and its sub components originates from the International Monetary Fund (IMF), and the UN Statistics Division(UNSD) for countries not covered by the IMF. However, due to a limited time coverage from IMF and UNSD for a number of countries, the Organisation for Economic Co-operation and Development (OECD), the European statistics (EUROSTAT), the Latin America and the Caribbean statistics (CEPALSTAT), Central Bank of Western African States (BCEAO), Eastern Caribbean Central Bank (ECCB) and national statistical office website data are used for missing historical data from IMF and UNSD food CPI. The FAO CPI dataset for all items (or general CPI) and the Food CPI, consists of a complete and consistent set of time series from January 2000 onwards. It further contains regional and global food CPIs compiled by FAO using population weights to aggregate across countries.   
  
  
  
  
  
Data Availability  
  
  
  
Breakdown of the number of countries covered by region is as follows(Food Price monitored, Food CPI):  
  
World  
  
  
  
191  
  
Africa  
  
37  
  
49  
  
Northern Africa  
  
2  
  
5  
  
Sub-Saharan Africa  
  
35  
  
  
  
Eastern Africa  
  
10  
  
17  
  
Middle Africa  
  
  
  
6  
  
Southern Africa  
  
10  
  
5  
  
Western Africa  
  
15  
  
16  
  
Americas  
  
19  
  
41  
  
Latin America and the Caribbean  
  
18  
  
30  
  
Caribbean  
  
2  
  
19  
  
Latin America  
  
15  
  
11  
  
Central America  
  
  
  
8  
  
Northern America  
  
1  
  
3  
  
Asia  
  
20  
  
44  
  
Central Asia  
  
  
  
3  
  
Eastern Asia  
  
  
  
5  
  
Southern Asia  
  
  
  
9  
  
South-Eastern Asia  
  
  
  
9  
  
Western Asia  
  
  
  
18  
  
Europe  
  
5  
  
43  
  
Eastern Europe  
  
4  
  
10  
  
Northern Europe  
  
  
  
11  
  
Southern Europe  
  
1  
  
15  
  
Western Europe  
  
  
  
7  
  
Oceania  
  
  
  
14  
  
Australia and New Zealand  
  
  
  
2  
  
Melanesia  
  
  
  
5  
  
Micronesia  
  
  
  
3  
  
Polynesia  
  
  
  
4  
  
  
  
  
  
Calendar  
  
  
  
Data collection:  
  
Food commodity prices in the FPMA tool are updated monthly. Food Price Indices in FAOSTAT are updated quarterly  
  
Data release:  
  
The next release for data on this indicator is projected for February 2019  
  
  
  
  
  
Data providers  
  
  
  
The sources of the price information are numerous and are listed for each price series in the FPMA tool at http://www.fao.org/giews/pricetool/. For the Food Price Indices the source is FAOSTAT http://www.fao.org/faostat/en/#data/CP  
  
Data compilers  
  
FAO  
  
References  
  
  
  
URL:  
  
http://www.fao.org/giews/food-prices/research/en/  
  
  
  
References:  
  
http://www.fao.org/giews/food-prices/research/detail/en/c/235685/

Last updated: 01 March 2019  
  
  
  
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture  
  
Target 2.5: By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed  
  
Indicator 2.5.1: Number of plant and animal genetic resources for food and agriculture secured in either medium or long-term conservation facilities  
  
  
  
Institutional information  
  
  
  
Organization(s):  
  
Food and Agriculture Organization of the United Nations (UN FAO)  
  
  
  
Concepts and definitions  
  
  
  
Definition:  
  
The conservation of plant and animal genetic resources for food and agriculture (GRFA) in medium or long term conservation facilities (ex situ, in genebanks) represents the most trusted means of conserving genetic resources worldwide. Plant and animal GRFA conserved in these facilities can be easily used in breeding programmes as well, even directly on-farm.  
  
  
  
The measure of trends in ex situ conserved materials provides an overall assessment of the extent to which we are managing to maintain and/or increase the total genetic diversity available for future use and thus protected from any permanent loss of genetic diversity which may occur in the natural habitat, i.e. in situ, or on-farm.  
  
  
  
The two components of the indicator, plant and animal GRFA, are separately counted.  
  
  
  
Plant genetic resources   
  
The plant component is calculated as the number of accessions of plant genetic resources secured in conservation facilities under medium or long term conditions, where an ‘accession’ is defined as a distinct sample of seeds, planting materials or plants which is maintained in a genebank. Genebank Standards for Plant Genetic Resources for Food and Agriculture (accessible at http://www.fao.org/documents/card/en/c/7b79ee93-0f3c-5f58-9adc-5d4ef063f9c7/), set the benchmark for current scientific and technical best practices for conserving plant genetic resources, and support key international policy instruments for the conservation and use of plant genetic resources. These voluntary standards have been endorsed by the FAO Commission on Genetic Resources for Food and Agriculture at its Fourteenth Regular Session (http://www.fao.org/docrep/meeting/028/mg538e.pdf).   
  
  
  
Animal genetic resources   
  
The animal component is calculated as the number of local breeds (i.e. being reported to exist only in one country) stored within a genebank collection with an amount of genetic material stored which is required to reconstitute the breed in case of extinction (further information on “sufficient material stored to reconstitute a breed” can be found in the Guidelines on Cryconservation of Animal Genetic Resources, FAO, 2012, accessible at http://www.fao.org/docrep/016/i3017e/i3017e00.htm). The guidelines have been endorsed by the FAO Commission on Genetic Resources for Food and Agriculture at its Thirteenth Regular Session (http://www.fao.org/docrep/meeting/024/mc192e.pdf).  
  
Rationale:  
  
Genetic resources for food and agriculture provide the building blocks of food security and, directly or indirectly, support the livelihoods of every person on earth. As the conservation and accessibility to these resources are of vital importance, medium- or long- term conservation facilities (genebanks) to preserve and make these resources and their associated information accessible for breeding and research have been established at country, regional and global levels. Inventories of genebank holdings provide a dynamic measure of the existing plant and animal diversity and its level of preservation. Data relevant to this indicator facilitate the monitoring of diversity secured and accessible through genebanks and support the development and updating of strategies for the conservation and sustainable use of genetic resources.  
  
  
  
The indicator is related to a monitoring framework endorsed by the FAO Commission on Genetic Resources for Food and Agriculture in which the status and trends of plant and animal genetic resources are described through globally agreed indicators and regular country-driven assessments.   
  
  
  
The number of materials conserved under medium- or long-term storage conditions provides an indirect measurement of the total genetic diversity, which are managed to secure for future use. Overall, positive variations are therefore approximated to an increase in the agro-biodiversity secured, while negative variations to a loss of it.   
  
  
  
Caution needs to be paid in the reporting and interpretation of the indicator. In the case of plant genetic resources, an uncontrolled addition of accessions that are in fact duplicates of samples already conserved and accounted for, or, vice versa, the deletion from the reported collections of redundant duplicates may lead to wrong interpretations. In order to avoid duplicate counting at the national level, primarily base collections should be reported. An active collection could be reported, only when, in the absence of a base collection, it also serves the function of the base collection.Another example that needs to be monitored both while reporting and interpreting the results include the grouping or splitting of accessions, as in both cases the variation in the accounted number does not reflect a variation in the genetic diversity conserved and secured. Therefore, it is crucial that reporting countries and regional/international centres together with the accession level information requested explain also the reason for the decrease or increase in the number of accessions, in particular when this does not reflect a real loss or gain in the genetic diversity conserved and secured.  
  
  
  
Concepts:  
  
Plant genetic resources  
  
Plant genetic resources for food and agriculture (PGRFA): Any genetic material of plant origin of actual or potential value for food and agriculture.  
  
  
  
Accession: An accession is defined as a sample of seeds, planting materials or plants representing either a wild population, a landrace, a breeding line or an improved cultivar, which is conserved in a genebank. Each accession should be distinct and, in terms of genetic integrity, as close as possible to the sample provided originally.  
  
  
  
Base collection: A base collection is defined as a set of unique accessions to be preserved for a medium to long-term period.  
  
  
  
Active collection: An active collection is defined as a set of distinct accessions that is used for regeneration, multiplication, distribution, characterization and evaluation. Active collections are maintained in short to medium-term storage and usually duplicated in a base collection.   
  
  
  
Medium or long term conservation facilities: Biological diversity is often conserved ex situ, outside its natural habitat, in facilities called genebanks. In the case of plant genetic resources, genebanks conserve base collections under medium or long term storage conditions, in the form of seeds in cold rooms, plants in the field and tissues in vitro and/or cryoconserved.   
  
  
  
Animal genetic resources  
  
Breed: A breed is either a sub-specific group of domestic livestock with definable and identifiable external characteristics that enable it to be separated by visual appraisal from other similarly defined groups within the same species, or a group for which geographical and/or cultural separation from phenotypically similar groups has led to acceptance of its separate identity.   
  
  
  
Medium or long term conservation facilities: Biological diversity is often conserved ex situ, outside its natural habitat, in facilities called genebanks. In the case of domestic animal diversity, ex situ conservation includes both the maintenance of live animals (in vivo) and cryoconservation.   
  
  
  
Cryoconservation is the collection and deep-freezing of semen, ova, embryos or tissues for potential future use in breeding or regenerating animals.  
  
  
  
Comments and limitations:  
  
Plant genetic resources  
  
Broadly, two issues are of concern in using the “number of accessions” as an indicator of diversity in ex situ collections:  
  
  
  
Undetected duplicates of accessions may contribute to an increase of the indicator, as each accession is a managed unit, kept and recorded as distinct. The detection of such duplicates will therefore result in a reduction in the number of accession previously reported. This can occur at different levels, for example within genebank collections and also at international level.  
  
  
  
A loss of viability of the material(s) conserved that is not promptly detected may similarly not be reflected in the number of accessions, contributing to an overestimate of the actual number of accessions.  
  
  
  
Additional information could be provided by other indicators measuring ex situ conservation, which are part of the monitoring of the implementation of the Global Plan of Action for PGRFA under the FAO Commission on Genetic Resources for Food and Agriculture.   
  
  
  
Animal genetic resources  
  
Information on cryoconserved material in the Domestic Animal Diversity Information System DAD-IS needs to be updated on a regular base..  
  
  
  
Methodology  
  
  
  
Computation Method:  
  
Plant genetic resources  
  
The plant component of the indicator is calculated as the total number of unique accessions of plant genetic resources secured in medium to long term conservation facilities. This should include all the accessions in base collections, and unique accessions stored in medium term conservation facilities, as active collections, only when these accessions are considered to become part of the national base collections. Base collections may include both seed, field, cryo-preserved or in vitro collections depending on the species conserved and the available facilities in the country.  
  
  
  
Animal genetic resources  
  
For the animal component the indicator is calculated as the number of local breeds with enough genetic material stored within genebank collections allowing to reconstitute the breed in case of extinction (based on the Guidelines on Cryconservation of animal genetic resources, FAO, 2012, http://www.fao.org/docrep/016/i3017e/i3017e00.htm).  
  
  
  
Disaggregation:  
  
For both plant and animal components geographic disaggregation (national, regional, global) is made. Grouping by sex, age etc. is not applicable.  
  
  
  
Treatment of missing values:  
  
  
  
At country level  
  
For plants missing values are treated as such and not replaced by estimates. For animals, for a given breed, if no data are provided for a respective year, it is assumed that the storage status remains the same as for the last year for which data have been reported. In this case the nature of data is considered to be estimated. However, if the most recent reporting refers to a year more than 10- years before, the storage status is considered “unknown”.   
  
  
  
At regional and global levels  
  
For both components, plants and animals, missing values are treated as such and not replaced by estimates.  
  
  
  
Regional aggregates:  
  
For both components, plants and animals, aggregates are the sum of country values.  
  
  
  
Sources of discrepancies:  
  
There are no internationally estimated data. Data on this indicator are all produced by countries and regional or international centres.   
  
  
  
Methods and guidance available to countries for the compilation of the data at the national level:  
  
For the plant component of the indicator, officially appointed National Focal Points and managers of regional or international genebanks are requested to provide the list of accessions conserved in medium or long term conservation facilities by filling a spreadsheet contained in document List of descriptors for reporting on the Plant Component of SDG indicator 2.5.1 (see References) accessible from the WIEWS home page (http://www.fao.org/wiews). Out of the 12 passport descriptors which can be used to characterize each accession, four are mandatory: (i) the name of the genebank (or holding institute code); (ii) the accession number; (iii) the scientific name of the accession (name of taxon, including genus, species and lower taxonomic ranking); and (iv) the type of storage. Reporting on the remaining descriptors is highly recommended, as it allows the analysis of changes in different types of diversity concerned, including changes in the type and origin of the material secured (e.g. biological status; country of origin; locations of safety duplications; etc.) and better describes the composition of the secured materials. The descriptors have been agreed by the FAO Commission on Genetic Resources for Food and Agriculture (see question 6.2 in the “Reporting format for monitoring the implementation of the Second global Plan of Action for Plant Genetic Resources for Food and Agriculture” http://www.fao.org/3/a-mm294e.pdf). Genebank holdings are counted based on the list of accessions reported.  
  
  
  
For the animal component the National Coordinators for the Management of Animal Genetic Resources provide the type of material (e.g. semen samples, embryos, somatic cells) cryo-conserved within the framework of a cryconservation programme, as well as the number of the respective male and female donors to the Domestic Animal Diversity Information System DAD-IS.  
  
  
  
Quality assurance  
  
FAO. 2012. Cryoconservation of animal genetic resources. FAO Animal Production and Health Guidelines No. 12. Rome. (available at http://www.fao.org/docrep/016/i3017e/i3017e00.pdf)  
  
  
  
FAO 2014. Genebank Standards for Plant Genetic Resources for Food and Agriculture. Rome. (http://www.fao.org/3/a-i3704e.pdf)  
  
  
  
Data Sources  
  
  
  
Description:  
  
Plant genetic resources  
  
Data are sourced from officially appointed National Focal Points (NFP) (see http://www.fao.org/agriculture/crops/thematic-sitemap/theme/seeds-pgr/gpa/national-focal-points/en/) and regional and international agricultural research centres holding PGRFA ex situ collections. Data providers report either (i) directly to FAO by using the spreadsheet contained in document List of descriptors for reporting on the Plant Component of SDG indicator 2.5.1 (see References) accessible from the WIEWS home page (http://www.fao.org/wiews) or (ii) through published information systems which comply with the standard of the FAO/Bioversity Multi-crop Passport Descriptor List (MCPD) v. 2 (see References), e.g. EURISCO (http://eurisco.ipk-gatersleben.de/) and Genesys (https://www.genesys-pgr.org).   
  
  
  
Data are stored in the World Information and Early Warning System for plant genetic resources for food and agriculture (WIEWS - http://www.fao.org/wiews), the FAO platform established to facilitate information exchange as well as periodic assessments of the state of the world’s plant genetic resources for food and agriculture.   
  
  
  
Animal genetic resources  
  
National Coordinators for Management of Animal Genetic Resources, nominated by their respective government, provide data to the Domestic Animal Diversity Information System (DAD-IS) (http://dad.fao.org/). DAD-IS allows countries the storage of data on animal genetic resources being secured in either medium or long term conservation facilities as needed for the indicator.  
  
  
  
Collection process:  
  
The indicator is related to a monitoring framework endorsed by the FAO Commission on Genetic Resources for Food and Agriculture in which the status and trends of plant and animal genetic resources are described through globally agreed indicators and regular country-driven assessments. Officially appointed National Focal Points / National Coordinators report directly to FAO, using a format agreed by the FAO Commission on Genetic Resources for Food and Agriculture.  
  
  
  
Sessions of the intergovernmental technical working groups on plant and on animal genetic resources for food and agriculture allow for formal consultation processes.  
  
  
  
Data Availability  
  
  
  
Description:  
  
Plant genetic resources  
  
The data collected as part of the first monitoring cycle of the implementation of the Second Global Plan of Action for PGRFA serve as baseline (number of accessions as of June 2014).   
  
  
  
As of February 2019, data on over 5 million accessions from 98 countries and 17 international/regional centres are being published. The data collection is carried out annually in January. Continued efforts are made to improve the coverage of countries and international/regional centres, as well as the quality of the information.  
  
  
  
Animal genetic resources  
  
The analysis of country reports to FAO provided by 128 countries in 2014 for the preparation of ‘The Second Report on the State of the World’s Animal Genetic Resources for Food and Agriculture’ provided a first baseline with regard to the number of national breed populations where sufficient material is stored. As of March 2018 the information reported in DAD-IS was still scarce. According to DAD-IS, genetic material is cryoconserved for only a very low proportion (3 percent) of local breeds and for only around 1 percent of breeds is the quantity of stored material estimated to be sufficient for population reconstitution. The data from the Country Reports are not directly comparable with the data in DAD-IS, because the Country Reports refer also to transboundary breeds. However, the results based on DAD-IS data underline the urgent need for countries to report information relating to cryconserved material in DAD-IS.  
  
  
  
Time series:  
  
Plant genetic resources  
  
Data are available in WIEWS for 2014, 2016, 2017 and 2018. Estimates of the status of the indicator before 2014 are made using the acquisition date of the accessions reported in 2014.  
  
  
  
Animal genetic resources  
  
Base line of data are country reports provided in 2014. DAD-IS data are available for 2017 and 2018.  
  
  
  
Calendar  
  
  
  
Data collection:  
  
Plant genetic resources   
  
Data collection is undertaken on an annual basis in the context of the FAO Commission on Genetic resources for Food and Agriculture.  
  
  
  
Animal genetic resources   
  
Data in DAD-IS can be updated throughout the whole year.   
  
   
  
Data release:  
  
Plant genetic resources   
  
First quarter of the year.  
  
  
  
Animal genetic resources  
  
First quarter of the year.  
  
  
  
Data providers  
  
The officially nominated National Focal Points / National Coordinators, and managers of regional/international genebanks. For information by country see for plant genetic resources http://www.fao.org/agriculture/crops/thematic-sitemap/theme/seeds-pgr/gpa/national-focal-points/en/ and for animal genetic resources http://www.fao.org/dad-is/national-coordinators/en/ .  
  
  
  
Data compilers  
  
Food and Agriculture Organization of the United Nations (UN FAO)  
  
  
  
References  
  
  
  
Plant genetic resources  
  
National Focal Points for the monitoring of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture and the preparation of country reports for The Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture: http://www.fao.org/agriculture/crops/thematic-sitemap/theme/seeds-pgr/gpa/national-focal-points/en/  
  
List of descriptors for reporting on the Plant Component of SDG indicator 2.5.1, FAO 2017 http://www.fao.org/fileadmin/user\_upload/wiews/docs/SDG\_251\_data\_requirement\_sheet\_table\_EN.docx   
  
Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture: http://www.fao.org/docrep/015/i2624e/i2624e00.htm  
  
Second Report on the State of the World’s Plant Genetic Resources for Food and Agriculture  
  
http://www.fao.org/docrep/013/i1500e/i1500e00.htm  
  
Genebank Standards for Plant Genetic Resources for Food and Agriculture, FAO, 2014  
  
http://www.fao.org/documents/card/en/c/7b79ee93-0f3c-5f58-9adc-5d4ef063f9c7/  
  
Targets and Indicators for Plant Genetic Resources for Food and Agriculture, In: Report of the Fourteenth Regular Session of the Commission on Genetic Resources for Food and Agriculture,   
  
CGRFA-14/13/Report, Appendix C, http://www.fao.org/docrep/meeting/028/mg538e.pdf  
  
Reporting Format for Monitoring the Implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture, CGRFA-15/15/Inf.9, http://www.fao.org/3/a-mm294e.pdf  
  
FAO/Bioversity Multi-Crop Passport Descriptor (MCPD) v. 2   
  
http://www.bioversityinternational.org/fileadmin/user\_upload/online\_library/publications/pdfs/FAO-Bioversity\_multi\_crop\_passport\_descriptors\_V\_2\_Final\_rev\_1526.pdf  
  
  
  
Animal genetic resources  
  
Preparation of the First Report on the State of the World's Animal Genetic Resources  
  
Guidelines for the Development of Country Reports. Annex 2. Working definitions for use in developing country reports and providing supporting data.  
  
http://www.fao.org/docrep/004/y1100m/y1100m03.htm  
  
Guidelines on Cryconservation of Animal Genetic Resources, FAO, 2012, accessible at http://www.fao.org/docrep/016/i3017e/i3017e00.htm  
  
National Coordinator for Management of Animal Genetic Resources:   
  
http://dad.fao.org/cgi-bin/EfabisWeb.cgi?sid=-1,contacts  
  
Status of Animal Genetic Resources – 2016, CGRFA/WG-AnGR-9/16/Inf.3,  
  
http://www.fao.org/3/a-mq950e.pdf  
  
Guidelines on In vivo Conservation of Animal Genetic Resources, FAO, 2013, http://www.fao.org/docrep/018/i3327e/i3327e.pdf  
  
The Second Report on the State of the World’s Animal Genetic Resources for Food and Agriculture  
  
http://www.fao.org/3/a-i4787e.pdf  
  
  
  
Related indicators as of February 2020  
  
  
  
The component on animal genetic resources has linkages with indicator 2.5.2.

Last updated: February 2020  
  
  
  
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture  
  
Target 2.4: By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality  
  
Indicator 2.4.1: Proportion of agricultural area under productive and sustainable agriculture  
  
  
  
Institutional information  
  
  
  
Organization(s):  
  
Food and Agriculture Organization of the United Nations (FAO)  
  
  
  
Concepts and definitions  
  
  
  
Definition:  
  
The indicator is defined by the formula:  
  
  
  
  
  
  
  
This implies the need to measure both the extent of land under productive and sustainable agriculture (the numerator), as well as the extent of agriculture land area (the denominator).  
  
  
  
The numerator captures the three dimensions of sustainable production: environmental, economic and social. It corresponds to agricultural land area of the farms that satisfy sub-indicators selected across all three dimensions.  
  
  
  
The denominator in turn the sum of agricultural land area (as defined by FAO) utilized by agricultural holdings that are owned (excluding rented-out), rented-in, leased, sharecropped or borrowed. State or communal land used by farm holdings is not included. Please see the methodological document prepared by FAO for a more detailed explanation.  
  
  
  
The scope of indicator 2.4.1 is the agricultural farm holding, and more precisely the agricultural land area of the farm holding, i.e. land used primarily to grow crops and raise livestock. This choice of scope is fully consistent with the intended use of a country’s agricultural land area as the denominator of the aggregate indicator. Specifically:  
  
  
  
Included within scope:  
  
Intensive and extensive crops and livestock production systems.  
  
Subsistence agriculture.  
  
State and common land when used exclusively and managed by the farm holding.  
  
Food and non-food crops and livestock products (e.g. tobacco, cotton, and sheep wool).   
  
Crops grown for fodder or for energy purposes.  
  
Agro-forestry (trees on the agriculture areas of the farm).  
  
Aquaculture, to the extent that it takes place within the agricultural land area. For example, rice-fish farming and similar systems.   
  
  
  
Excluded from scope:  
  
State and common land not used exclusively by the farm holding.  
  
Nomadic pastoralism.  
  
Production from gardens and backyards. Production from hobby farms.  
  
Holdings focusing exclusively on aquaculture.   
  
Holdings focusing exclusively on forestry.  
  
Food harvested from the wild.  
  
  
  
Rationale:  
  
  
  
The approaches to framing and defining sustainable agriculture vary in terms of their coverage of the three primary dimensions of sustainability, i.e. economic, environmental and social, and in terms of the scale that is used to assess sustainability, i.e. from field and farm scales, to national and global scales. Some approaches consider different features of sustainability, for example whether current practices are economically feasible, environmentally friendly and socially desirable. Other approaches focus on particular practices such as organic, regenerative or low-input agriculture and can equate these with sustainable agriculture.   
  
  
  
The conclusion from a literature review associated with the methodological development of this indicator is that the multi-dimensional approach developed by FAO in 1988 is a meaningful framing of the concept. Thus, sustainable agriculture can be considered as:   
  
  
  
“The management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generation. Such development (in agriculture, forestry and fishing etc.) conserves land, water, plant and animal genetic resources, environmentally non-degrading, technically appropriate, economically viable and socially acceptable.” (FAO, 1988)  
  
  
  
  
  
Concepts:  
  
  
  
The literature review (Hayati, 2017) identified a large number of potential sustainability themes across the three dimensions of sustainability and, for each theme, usually a large number of possible sub-indicators. The key considerations in the selection of themes are relevance and measurability. In terms of relevance, the relationship between the associated sub-indicator and sustainable agriculture outcomes at farm level should be strong. Following this approach, only sub-indicators that are responsive to farm level policies aimed at improving sustainable agriculture are considered. In terms of measurability, only a “core” set of themes and sub-indicators for which measurement and reporting is expected in the majority of countries are selected.  
  
  
  
A key aspect of all approaches to measuring sustainable agriculture is the recognition that sustainability is a multi-dimensional concept, and that these multiple dimensions need to be reflected in the construction of the indicator. This implies that SDG indicator 2.4.1 must be based on a set of sub-indicators that cover these three dimensions.  
  
  
  
Through a consultative process that has lasted over two years, 11 themes and sub-indicators have been identified, which make up SDG 2.4.1.  
  
  
  
No.  
  
Themes  
  
Sub-indicators  
  
1  
  
Land productivity  
  
Farm output value per hectare  
  
2  
  
Profitability  
  
Net farm income   
  
3  
  
Resilience  
  
Risk mitigation mechanisms   
  
4  
  
Soil health  
  
Prevalence of soil degradation  
  
5  
  
Water use  
  
Variation in water availability  
  
6  
  
Fertilizer pollution risk  
  
Management of fertilizers  
  
7  
  
Pesticide risk  
  
Management of pesticides   
  
8  
  
Biodiversity  
  
Use of agro-biodiversity-supportive practices   
  
9  
  
Decent employment  
  
Wage rate in agriculture  
  
10  
  
Food security  
  
Food Insecurity Experience Scale (FIES)  
  
11  
  
Land tenure  
  
Secure tenure rights to land  
  
  
  
Please see the annex for a detailed description of the sub-indicators.  
  
  
  
Comments and limitations:  
  
  
  
An earlier version of the methodology suggested a combination of different data collection instruments to monitor the various sub-indicators. In the consultations undertaken, however, several countries did highlight the difficulties in combining data from different sources and requested that this be avoided to the extent possible. Other, relatively data rich, countries, instead, insisted on the need to allow for the use of existing data sources. This revised methodology addresses both concerns: it offers the farm survey as a single data collection instrument for all sub-indicators, but it also offers the possibility of using a combination of different data sources as an alternative option as long as certain criteria are satisfied.  
  
  
  
The decision to use the farm survey as a unique data collection instrument is in line with countries’ efforts, supported by FAO, to develop farm surveys as the most appropriate tool for generating agricultural statistics. It also benefits from the FAO work in developing the Agricultural Integrated Survey (AGRIS) programme, which has been recently finalized as part of a new initiative called 50 X 2030.   
  
  
  
The decision to focus on farm survey has implications on the type of information that it is possible to capture in order to cover the different dimensions of sustainability. While farm surveys are well suited to measure the economic dimension of sustainability, they may not be the ideal tool for measuring environmental and social sustainability in terms of impact/outcomes.   
  
  
  
Typically, environmental impacts of agriculture are measured through monitoring systems like remote sensing, soil and water sampling, or other tools associated with a specific area, rather than with a single agricultural holding. For several environmental themes, it is unlikely that farmers would be able to assess the environmental impact of their farming practices on issues like fertilizer pollution or pesticide impact. Using a farm survey instrument, instead of environmental monitoring systems, therefore implies moving from measuring outcome/impact to assessing farmers’ behaviour. Whenever possible, however, the revised methodology continues to focus on measuring outcomes.   
  
  
  
The sub-themes under the social dimension are usually best captured through household surveys. While in the majority of cases agricultural holdings are closely associated with a given household, this is not always the case, and therefore capturing the social dimension of sustainability through a farm survey could pose certain challenges.  
  
  
  
  
  
  
Methodology  
  
  
  
Computation Method:  
  
  
  
Steps to calculate SDG 2.4.1 include:  
  
Determining the scope of the indicator: The scope of Indicator 2.4.1 is the agricultural farm holding, and more precisely the agricultural land area of the farm holding, i.e., land used primarily to grow crops and raise livestock. Forestry, fisheries and aquaculture activities may be included to the extent that they are secondary activities conducted on the agricultural area of the farm holding, for example rice-fish farming and similar systems.  
  
Determining the dimensions to be covered: Indicator 2.4.1 includes environmental, economic and social dimensions in the sustainability assessment.   
  
Choosing the scale for the sustainability assessment: Indicator 2.4.1 is farm level with aggregation to higher levels.  
  
Selecting the data collection instrument(s). It is recommended that indicator 2.4.1 be collected through a farm survey.  
  
Selecting the themes within each dimension, and choosing a sub-indicator for each theme. The sub-indicators should satisfy a number of criteria (described in annex 1 for each sub-indicator, respectively).   
  
Assessing sustainability performance at farm level for each sub-indicator: Specific sustainability criteria are applied in order to assess the sustainability level of the farm for each theme according to the respective sub-indicators.   
  
Deciding the periodicity of monitoring the indicator. It is recommended to be collected at least every three years.  
  
Modality of reporting the indicator. The set of sub-indicators are presented in the form of a dashboard. The dashboard approach offers a response in terms of measuring sustainability at farm level and aggregating it at national level.   
  
  
  
The 2.4.1 methodology proposes reporting of indicator 2.4.1 through a national-level dashboard, presenting the different sub-indicators together but independently. The dashboard approach offers several advantages, including the possibility of combining data from different sources and identification of critical sustainability issues, facilitating the search for a balance between the three sustainability dimensions. As a result, countries can easily visualize their performance in terms of the different sustainability dimensions and themes, and understand where policy efforts can be focused for future improvements.  
  
  
  
  
  
Computation of results and construction of the dashboard are performed for each sub-indicator separately using the ‘traffic light’ approach already defined for each sub-indicator: aggregation at national level is performed for each sub-indicator independently, by summing the agricultural land area of each agricultural holdings by sustainability category (red, yellow or green), and reporting the resulting national total as percentage of the total national agricultural land area of all agricultural farm holdings in the country. In practice, the reported value of Indicator 2.4.1 is determined by the results of most-limiting sub-indicator in terms of sustainability performance  
  
  
  
  
  
Disaggregation:  
  
  
  
Indicator 2.4.1 is expected to be collected through farm surveys and the result expressed as a national value. However, the methodology is scale independent and can be adopted at any geographical level. In addition the indicator can be disaggregated according to type of farming system (crop, livestock or mixed) and other characteristics of the farm e.g. size, or gender of the farm holder.  
  
  
  
Treatment of missing values:  
  
  
  
Partial non-response at individual level (farm holding) will be imputed using appropriate statistical techniques, such as nearest-neighbour algorithms. The decision on whether to impute or not and the choice of the method is a function of the nature of the variable to impute and the amount and type of data available for the imputation, such as the availability of auxiliary data coming from different sources (e.g. surveys, administrative information).   
  
  
  
It is important to clearly distinguish missing data from non-applicable events. As specified above and in the sub-indicator methodology sheets, some sub-indicators can be recorded as ‘not applicable’ for a given farm. In this case, the farm will be considered sustainable from the perspective of the given sub-indicators.  
  
  
  
Regional aggregates:  
  
  
  
These data will be disseminated through FAOSTAT, the largest database of food and agricultural statistics. Therefore the method of calculation will follow the international standard established by the database. In the case of this indicator, regional and global aggregates will be computed by weighting the national indicators according to the country’s agricultural area.  
  
  
  
Sources of discrepancies:  
  
  
  
Given that this is a Tier II indicator, no data currently exists for this indicator. Therefore there are no discrepancies between national and sub-national data.  
  
  
  
  
  
Methods and guidance available to countries for the compilation of the data at the national level:  
  
  
  
The methodology note provides a detailed description for the computation of the indicator on the basis of the farm survey.   
  
  
  
  
  
  
  
  
  
 The values for reporting indicator 2.4.1 can be calculated as follows:  
  
  
  
  
  
where:  
  
SDG241d = proportion of agricultural land area that have achieved the ‘desirable’ level  
  
SId n = proportion of sub-indicator n that is classified as ‘desirable’   
  
min refers to the minimum level of SId n at national level across all 11 sub-indicators  
  
SDG241d is the proportion of agricultural area for which all sub-indicators are green.  
  
   
  
  
  
where:  
  
SDG241a+d = proportion of agricultural land area that have achieved at least the ‘acceptable’ level (estimated by excess, see note below)  
  
SId n = proportion of sub-indicator n that is classified as ‘desirable’   
  
SIa n = proportion of sub-indicator n that is classified as ‘acceptable’   
  
min refers to the minimum level of (SId n + SIa n) at national level across all 11 sub-indicators  
  
SDG241a+d is the proportion of agricultural area for which all indicators are either green or yellow, an acceptable situation, but that could be improved.   
  
  
  
  
  
where:  
  
SDG241u = proportion estimated by default of agricultural area that is ‘unsustainable’ (see note below)  
  
SIu n = proportion of sub-indicator n that is classified as ‘unsustainable’  
  
max refers to the highest value of SIu n across all 11 sub-indicators at national level  
  
SDG241u = is the proportion of agricultural area for which at least one sub-indicator is unsustainable, and is therefore classified as unsustainable.   
  
The performances of countries over time can be measured by the change in the value of SDG241d and SDG241a+d. An increase over time indicates improvement, while decrease indicates degradation.   
  
  
  
Quality assurance  
  
  
  
FAO will work closely with countries for quality assurance. Not only will data collection for SDG 2.4.1 respect international standards, it will also adhere to FAO’s data quality assurance “Statistics Quality Assurance Framework” (http://www.fao.org/statistics/standards/en/).  
  
  
  
Data Sources  
  
  
  
Description:  
  
  
  
Different data are collected through different instruments. Often, environmental data are collected through environmental monitoring systems, including remote sensing. Yet many countries do not have the capacity or resources to do so, and therefore these data are sparse or non-existent. In order to propose a manageable and cost-effective solution, a requirement stressed by several countries during the consultations, the methodology offers a single data collection instrument for all sub-indicators: the farm survey.  
  
  
Several countries have suggested using existing data sources or alternative data sources on the grounds that these instruments can be more cost-effective and sometimes provide more reliable results than farm surveys. These instruments include remote sensing, GIS, models, agricultural surveys, household surveys, administrative data or environmental monitoring systems. The methodology considers the possibility to use such instruments, subject to a series of criteria to ensure data quality and international comparability. Other data sources may also be used to complement and/or validate farm survey results.  
  
  
  
The methodology note also recommends that countries complement the farm survey with a monitoring system that can measure the impact of agriculture on the environment (soil, water, fertilizer and pesticide pollution, biodiversity) and on health (pesticides residues in food and human bodies). This will provide additional information and help crosscheck the robustness of SDG indicator 2.4.1 with regard to the environmental dimension of sustainability.  
  
  
  
Collection process:  
  
  
  
A questionnaire module has been designed, which contains the core set of questions necessary to obtain the data for SDG 2.4.1. If farm surveys already exist within a country, these questions can be integrated into existing instruments in order to minimize the burden to national statistical offices in data collection.  
  
  
  
All data collection activities will be done through the National Statistical Office or the office designated to collect data for this indicator. FAO, together with the Global Strategy, has created all capacity development material necessary for this indicator, including a methodological guide, an enumerator manual, and a calculation document. An e-learning module has also been prepared and finalised to train country NSO and other relevant staff on the indictor..   
  
  
  
Data Availability  
  
  
  
Description:  
  
  
  
Many sub-indicators for this indicator are already being collected in countries, either as part of existing farm surveys or through other data sources such as environmental monitoring systems, administrative data or household surveys. Yet they are not collected in with a common set of criteria that guarantee the same quality or adherence to international comparability.   
  
  
  
SDG indicator 2.4.1 brings together 11 sub-indicators and, through a farm survey, guarantees comparability and a minimum set of standards for data quality.  
  
  
  
Time series:  
  
  
  
SDG Indicator 2.4.1 measures progress towards more sustainable and productive agriculture over a three year periodicity. For many sub-indicators, it is likely that changes will be relatively limited from a year to another. Furthermore, the 3-year periodicity will enable countries to have three data points on the indicator before 2030. It is therefore recommended that the survey be conducted every three years.   
  
  
  
Calendar  
  
  
  
Data collection:  
  
   
  
Data collection will depend on currently existing data collection cycles for farm surveys within countries. FAO has integrated the questionnaire module associated with this indicator in in AGRISurvey Programme and 50x2030 initiative..  
  
   
  
   
  
Data release:  
  
  
  
Although new data may not be available annually for each country, all new information is expected to be released annually through FAOSTAT.  
  
  
  
Data providers  
  
  
  
National Statistical Offices or designated offices within countries will be responsible for collecting data for this indicator.   
  
  
  
Data compilers  
  
  
  
National Statistical Offices or designated offices within countries will be responsible for collecting and compiling data for this indicator. They will in turn report to FAO who will provide capacity development, conduct quality control and disseminate the information through FAOSTAT. FAO will in turn report to the international statistical community.  
  
  
  
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Related indicators as of February 2020  
  
  
  
Direct links to:  
  
  
  
2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)  
  
  
  
5.a.1 (a) Percentage of people with ownership or secure rights over agricultural land (out of total agricultural population), by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure  
  
  
  
Indirect link to:  
  
Indicator 2.3.2: Average income of small-scale food producers, by sex and indigenous status  
  
  
Annex: description of the sub-indicators  
  
  
  
1. Farm output value per hectare  
  
Dimension: Economic   
  
Theme: Land Productivity   
  
Land productivity is a measure of agricultural value of outputs obtained on a given area of land. Maintaining or improving the output over time relative to the area of land used is an important aspect in sustainability for a range of reasons. At farm level, the land productivity reflects technology and production processes for given agro-ecological conditions. In a broader sense, an increase in the level of land productivity enables higher production while reducing pressure on increasingly scarce land resources, commonly linked to deforestation and associated losses of ecosystem services and biodiversity.   
  
Coverage: All farm types   
  
Description:   
  
The sub-indicator is described as farm output value per hectare (crops and livestock).   
  
Information on farm outputs and agricultural area should be standard information available from farm surveys thus providing a good basis for assessment at farm level.  
  
Farm output value: The volume of agricultural output at farm level generally takes into account production of multiple outputs, e.g. crop types and crop and livestock combinations, etc. Since the volume of agricultural outputs is not measured in commensurate units (e.g. not all outputs are measured in tonnes, and tonnes of different output represent different products), it is necessary to establish an appropriate means of aggregation, in this case using a monetary unit. A simple way to enable aggregation is to reflect the multiple outputs produced by a single farm in terms of values (i.e. quantity multiplied by prices).  
  
Farm agricultural land area: defined as the area of land used for agriculture within the farm.   
  
  
  
Sustainability criteria:   
  
Distance from the 90th percentile of the national distribution:  
  
Green (desirable): Sub-indicator value is ≥ 2/3 of the corresponding 90th percentile   
  
Yellow (acceptable): Sub-indicator value is ≥ 1/3 and < 2/3 of the corresponding 90th percentile   
  
Red (unsustainable): Sub-indicator value is < 1/3 of the corresponding 90th percentile  
  
  
  
  
  
Data items  
  
Reference period: last calendar year  
  
Quantities and farm gate prices (or value of production) of the 5 main crops and/or livestock products and by-products produced by the farm  
  
Quantities and farm gate prices (or value of production) of other agricultural products (agro-forestry or aquaculture products etc.) produced by the farm   
  
Agricultural land area of the holding  
  
  
  
  
  
2. Net Farm Income  
  
Dimension: Economic   
  
Theme: Profitability  
  
An important part of sustainability in agriculture is the economic viability of the farm, driven to a large extent by its profitability. Profitability is measured using the net income that the farmer is able to gain from farming operations. Availability and use of information on farm economic performance, measured using profitability, will support better decision making both at micro and macro-economic level. Since performance measures drive behaviour, better information on performance can alter behaviour and decision-making by government and producers both in large-scale commercial farming and medium and small-scale subsistence agriculture.  
  
Coverage: All farms types   
  
Description:   
  
The sub-indicator measures if the farm is consistently profitable over a 3-year period. The focus of this sub-indicator is on income from farming operations as distinct from the total income of the farming household, which may include other sources of income such as, for example, employment in local businesses by other family members, tourism activity, etc.  
  
Formula:  
  
  
  
where:  
  
NFI = Total Net Farm Income  
  
CR = Total farm cash receipts including direct program payments  
  
Yk = Income in kind  
  
OE = Total operating expenses after rebates (including costs of labour)  
  
Dep = Depreciation  
  
VIC = Value of inventory change  
  
Definitions:  
  
Net farm income refers to the return (both monetary and non-monetary) to farm operators for their labor, management and capital, after all production expenses have been paid (that is, gross farm income minus production expenses). It includes net income from farm production, the value of commodities consumed on the farm, depreciation, and inventory changes.  
  
Gross farm income refers to the monetary and non-monetary income received by farm. Its main components include cash receipts from the sale of farm products, direct program payments to producers, other farm income (such as income from custom work), value of food and fuel produced and consumed on the same farm, and change in value of year-end inventories of crops and livestock.  
  
Farm cash receipts include revenues from the sale of agricultural commodities in local currency units that include sales of crops, livestock and its by-products.  
  
Direct program payments to producers included in farm cash receipts represent the amounts paid under various government and private programs to individuals involved in agricultural production. The payments related to current agricultural production include subsidies to encourage production or to compensate producers for low market returns, payments to stabilize incomes and payments to compensate producers for crop or livestock losses caused by extreme climatic conditions, disease or other reasons and insurance payments.  
  
Income-in-kind measures the value of the agricultural goods produced on farms and consumed by farm operator families. It is included to measure total farm production.   
  
Operating expenses represent business costs incurred by farm businesses for goods and services used in the production process. Expenses include both purchase and self-produced items that are: property taxes, custom work, seeds, rent, fertiliser and lime, chemicals, machinery and building repairs, irrigation, fuel for heating and machines, wages, interest and business share of insurance premiums.   
  
Depreciation charges account for the economic depreciation or for the loss in fair market value of the capital assets of the farm business. Calculated on farm buildings, farm machinery, and the farm business share of autos, trucks and the farm home, depreciation is generally considered to be the result of aging, wear and tear, and obsolescence. It represents a decrease in the potential economic benefits that can be generated by the capital asset.   
  
Value of inventory change (VIC) measures the currency value of the physical change in producer-owned inventories. This concept is used to value total agricultural economic production. To calculate VIC, the change in producer-owned inventories (between the end and the beginning of a calendar year) is first derived and then multiplied by the average annual crop prices or value per animal. This calculation is different from the financial or accounting book value approach, which values the beginning and ending stocks, and then derives the change.  
  
The VIC over all the major commodities can vary widely (depending on the size of the change of inventories and prices). The VIC can be either positive (when inventories are larger at the end of the year compared to the beginning levels) or negative (when year- end inventories are smaller than the levels at the beginning of the year). If the inventory levels are the same at the beginning and end of the year, VIC will be zero despite price changes.  
  
  
  
Estimating profitability at a farm level will generally require compilation of basic farm financial records, i.e. daily, weekly, monthly or seasonal transactions in an organized way. In general, large commercial farms maintain detailed financial records however, in case of medium farms and small subsistence agriculture, record keeping is seldom practiced and in most of the countries it doesn’t exist at all.   
  
In case when detailed data are not available at farm level, then estimates will be calculated based on farmer declaration of both outputs and inputs quantities and prices. In these cases, depreciation, variation of stocks and taxes may be neglected. This is described below as simplified option (1).  
  
A simplified option (2) is also offered, based on farmer’s declaration of the agricultural holding’s profitability over the last three calendar years. It is recommended to use this simplified option only when other two options are not feasible.  
  
Sustainability criteria:   
  
For a farm to be profitable the net farm income should be above zero.   
  
Green (desirable): above zero for past 3 consecutive years  
  
Yellow (acceptable): above zero for at least 1 of the past 3 consecutive years  
  
Red (unsustainable): below zero for all of the past 3 consecutive years  
  
Data items  
  
Reference period: last three calendar years  
  
Recommended option  
  
Data from farm financial records, i.e. daily, weekly, monthly or seasonal transactions are collected in an organized way (in general, large commercial farms maintain detailed financial records on the basis of which the NFI can be calculated as per above equation).   
  
Simplified option (1)  
  
To be used when the detailed data are not available at farm level (better adapted to smallholders and household sector).   
  
Quantity produced (i.e. crops and livestock and its products and by-products produced both for market or self-consumption)   
  
Farm gate prices of above quantities produces  
  
Operating expenses including inputs quantities and its market prices  
  
 Quantity/output of other on-farm activities carried out and/or commodities produced on the holding e.g. aquaculture, agroforestry and others.   
  
Farm gate prices of the other on-farm activities/commodities  
  
Input quantities and prices that are used to produce other on-farm outputs  
  
Simplified option (2)  
  
Respondent’s declaration on agricultural holding’s profitability over the last 3 calendar years  
  
  
  
3. Risk mitigation mechanisms  
  
Dimension: Economic   
  
Theme: Resilience  
  
Resilience encompass absorptive, anticipatory and adaptive capacities and refers to the properties of a system that allows farms to deal with shocks and stresses, to persist and to continue to be well-functioning (in the sense of providing stability, predictable rules, security and other benefits to its members).   
  
Coverage: All farms types   
  
Description:   
  
This sub-indicator measures the incidence of the following mitigation mechanisms:   
  
Access to or availed credit.  
  
Access to or availed insurance.  
  
On farm diversification (share of a single agricultural commodity not greater than 66% in the total value of production of the holding).  
  
Access to credit and/or insurance is defined here as when a given service is available and the holder has enough means to obtain the service (required documents, collateral, positive credit history, etc.). Broadly, access to one or more the above 3 factors will allow the farm to prevent, resist, adapt and recover from external shocks such as, floods, droughts, market failure (e.g. price shock), climate shock and pest/animal diseases.   
  
  
  
Sustainability criteria:   
  
A farm holding is considered resilient if it has availed or has the means to access the risk mitigation mechanisms as follows:  
  
Green (desirable): Access to or availed at least two of the above-listed mitigation mechanisms.  
  
Yellow (acceptable): Access to or availed at least one of the above-listed mitigation mechanisms.  
  
Red (unsustainable): No access to the listed mitigation mechanisms.   
  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*  
  
Data items  
  
Reference period: last calendar year  
  
3.1. Agricultural holding access to or availed of credit, insurance or other financial instruments:  
  
Credit (formal, informal)   
  
Insurance   
  
3.2 List of other on-farm activities apart from crops and livestock  
  
3.3 Value of output for the listed on-farm activities/commodities  
  
  
  
4. Prevalence of soil degradation  
  
Dimension: Environmental   
  
Theme: Soil health   
  
Many of the processes affecting soil health are driven by agricultural practices. FAO and the Intergovernmental Technical Panel on Soils (ITPS) have identified 10 main threats to soil functions: soil erosion; soil organic carbon losses; nutrient imbalance; acidification; contamination; waterlogging; compaction; soil sealing; salinization and loss of soil biodiversity.   
  
Coverage: All farms types   
  
Description:   
  
The sub-indicator measures the extent to which agriculture activities affects soil health and therefore represents a sustainability issue. A review of the 10 threats to soil shows that all except one (soil sealing, which is the loss of natural soil to construction/urbanisation) are potentially and primarily affected by inappropriate agricultural practices. Ideally, therefore, all soils under agricultural land area in a country should be the subject of periodic monitoring in order to assess the impact of agriculture on soils. This requires detailed surveys and sampling campaigns, associated with laboratory testing. In order to propose a manageable solution while capturing the main trends in the country in terms of soil health, the farm survey focuses on the four threats that combine the characteristics more widespread (for national monitoring, countries may choose to add any of the other areas indicated above, depending on relevance), and easier to assess through farm surveys:  
  
Soil erosion  
  
Reduction in soil fertility  
  
Salinization of irrigated land  
  
Waterlogging  
  
Other - Specify  
  
The farm survey captures farmer’s knowledge about the situation of the agricultural holding in terms of soil degradation. Experience has shown that farmers are very much aware of the state of their soils, health and degradation level. Farmers may also be offered the opportunity to mention other threats than the above four.   
  
Other data sources on soil health may either complement the information collected through the farm survey and offer opportunities for cross-checking farmers’ responses; or be used as alternative sources of data. Prior to the farm survey, a desk study could collect all available information on soil health, including using national official statistics or statistics available from international agencies such as FAO. This typically includes maps, models, results from soil sampling, laboratory analysis and field surveys, and all existing report on soil and land degradation at national level. On the basis of this information, maps or tables (by administrative boundaries or other divisions of the country) can be established, showing the threats to soils according to the above 4 categories of threats.  
  
  
  
Sustainability criteria:   
  
Proportion of agricultural area of the farm affected by soil degradation.  
  
Green (desirable): The combined area affected by any of the four selected threats to soil health is negligible (less than 10% of the total agriculture area of the farm).  
  
Yellow (acceptable): The combined area affected by any of the four selected threats to soil health is between 10% and 50% of the total agriculture area of the farm.  
  
Red (unsustainable): The combined area affected by any of the four selected threats to soil health is above 50% of the total agriculture area of the farm.  
  
  
  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*  
  
Data items  
  
Reference period: last three calendar years  
  
  
  
4.1 List of soil degradation threats experienced on the holding  
  
Soil erosion (loss of topsoil through wind or water erosion)  
  
Reduction in soil fertility  
  
Salinization of irrigated land  
  
Waterlogging  
  
Other – Specify  
  
None of the above  
  
4.2 Total area of the holding affected by threats related to soil degradation  
  
  
  
  
  
5. Variation in water availability  
  
Dimension: Environmental   
  
Theme: Water use  
  
Agriculture, more specifically irrigated agriculture, is by far the main economic sector using freshwater resources. In many places, water withdrawal from rivers and groundwater aquifers is beyond what can be considered environmentally sustainable. This affects both rivers and underground aquifers. Sustainable agriculture therefore requires that that level of use of freshwater for irrigation remains within acceptable boundaries. While there is no internationally agreed standards of water use sustainability, signals associated with unsustainable use of water typically include progressive reduction in the level of groundwater, drying out of springs and rivers, increased conflicts among water users.   
  
Coverage: All farm types   
  
Description:   
  
The sub-indicator captures the extent to which agriculture contributes to unsustainable patterns of water use. Ideally, the level of sustainability in water use is measured at the scale of the river basin or groundwater aquifer, as it is the combined effect of all users sharing the same resource that impact water sustainability. The farm survey captures farmers’ awareness and behaviour in relation with water scarcity, and associates them with three levels of sustainability. These awareness and behaviour are expressed in terms of:  
  
whether the farmer uses water to irrigate crops on at least 10% of the agriculture area of the farm and why, if the answer is negative (does not need, cannot afford);  
  
whether the farmer is aware about issues of water availability in the area of the farm and notices a reduction in water availability over time;  
  
whether there are organizations (water users organisations, others) in charge of allocating water among users and the extent to which these organisations are working effectively.  
  
Other data sources may either complement the farm survey on water use and offer opportunities for cross-checking farmers’ responses; or be used as alternative sources of data. Prior to the farm survey, a desk study should collect all available information on water balance, including national official statistics or statistics available from international agencies such as FAO. Information on water resources and use is usually collected by the entities in charge of water management or monitoring and are organised by hydrological entity (river basin or groundwater aquifer). They typically include hydrological records (river flow, groundwater levels), models and maps showing the extent of water use by hydrological entity.  
  
  
  
Sustainability criteria:   
  
Farm sustainability in relation with water use will be assessed as follows:   
  
Green (desirable): Water availability remains stable over the years, for farms irrigating crops on more than 10% of the agriculture area of the farm. Default result for farms irrigating less than 10% of their agricultural area   
  
Yellow (acceptable): uses water to irrigate crops on at least 10% of the agriculture area of the farm, does not know whether water availability remains stable over the years, or experiences reduction on water availability over the years, but there is an organisation that effectively allocates water among users.   
  
Red (unsustainable): in all other cases.   
  
Data items  
  
Reference period: last three calendar years  
  
  
  
5.1 Irrigated agricultural area of the holding   
  
5.2 Reduction in water availability experienced on the holding  
  
5.3 Existence of organizations dealing with water allocation   
  
  
  
  
  
6. Management of fertilizers  
  
Dimension: Environmental   
  
Theme: Fertilizer pollution risk   
  
Agriculture can affect the quality of the environment through excessive use or inadequate management of fertilizers. Sustainable agriculture implies that the level of chemicals in soil and water bodies remains within acceptable thresholds. Integrated plant nutrient management considers all sources of nutrients (mineral and organic) and their management in order to obtain best nutrient balance. Measuring soil and water quality captures the extent and causes of pollution, but establishing monitoring systems of soil and water is costly and not always feasible in countries.   
  
Note: the management of plant nutrients addresses two sustainability issues: avoiding pollution, and maintaining a good level of soil fertility. This sub-indicator addresses the first issue, while the second one is addressed under sub-indicator 4 ‘Soil health’.   
  
Coverage: All farm types  
  
Description:   
  
The proposed approach is based on questions to farmers about their use of fertilizer, in particular mineral or synthetic fertilizers and animal manure, their awareness about the environmental risks associated with fertilizer and manure applications, and their behaviour in terms of plant nutrient management. Management measures considered to help reducing risk is as follows:   
  
Follow protocols as per extension service or retail outlet directions or local regulations, not exceeding recommended doses  
  
Use organic source of nutrients (including manure or composting residues) alone, or in combination with synthetic or mineral fertilizers   
  
Use legumes as a cover crop, or component of a multi/crop or pasture system to reduce fertilizer inputs  
  
Distribute synthetic or mineral fertilizer application over the growing period  
  
Consider soil type and climate in deciding fertilizer application doses and frequencies  
  
Use soil sampling at least every 5 years to perform nutrient budget calculations   
  
Perform site-specific nutrient management or precision farming  
  
Use buffer strips along water courses.  
  
Sustainability criteria:   
  
Farm sustainability in relation with fertilizer pollution risk will be assessed as follows:   
  
Green (desirable): The farm takes specific measures to mitigate environmental risks (at least four from the list above). Default result for farms not using fertilizers.   
  
Yellow (acceptable): the farm uses fertilizers and takes at least two measures from the above list to mitigate environmental risks  
  
Red (unsustainable): farmer uses fertilizer and does not take any of the above specific measures to mitigate environmental risks associated with their use.   
  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*  
  
Data items  
  
Reference period: last calendar year  
  
   
  
6.1 Use of synthetic or mineral fertilizer or animal manure/slurry by the agricultural holding (Y/N)  
  
6.2 Specific measures taken to mitigate the environmental risks associated with the excessive use or misuse use of fertilizers as per list below:   
  
⃝ 1 Follow protocols as per extension service or retail outlet directions or local regulations, not exceeding recommended doses   
  
⃝ 2 Use organic source of nutrients (including manure or composting residues) alone, or in combination with synthetic or mineral fertilizers  
  
⃝ 3 Use legumes as a cover crop, or component of a multi/crop or pasture system to reduce fertilizer inputs   
  
⃝ 4 Distribute synthetic or mineral fertilizer application over the growing period  
  
⃝ 5 Consider soil type and climate in deciding fertilizer application doses and frequencies  
  
⃝ 6 Use soil sampling at least every 5 years to perform nutrient budget calculations  
  
⃝ 7 Perform site-specific nutrient management or precision farming  
  
⃝ 8 Use buffer strips along water courses.  
  
  
  
  
  
  
  
7. Management of pesticides  
  
Dimension: Environmental   
  
Theme: Pesticide risk  
  
Pesticides are important inputs in modern agriculture (crop and livestock), but if not well managed they can cause harm to people’s health or to the environment. Practices associated with integrated pest management (IPM) exist that contribute to minimise risks associated with the use of pesticides and limit their impact on human health and on the environment. The International Code of Conduct on Pesticide Management defines best practice in pesticide management.  
  
Coverage: All farm types  
  
Description:   
  
The proposed sub-indicator is based on information on the use of pesticides on the farms, the type of pesticide used and the type of measure(s) taken to mitigate the associated risks. It considers the possibility that the holding uses pesticides in the framework of an Integrated Pest Management (IPM) program, or adopts specific measures to help reducing risks associated with pesticide use. List of possible measures:  
  
Health  
  
Adherence to label directions for pesticide use (including use of protection equipment while applying pesticides)  
  
Maintenance and cleansing of protection equipment after use  
  
Safe disposal of waste (cartons, bottles and bags)  
  
Environment  
  
Adherence to label directions for pesticide application  
  
Adopt any of the above good practices: adjust planting time, apply crop spacing, crop rotation, mixed cropping or inter-cropping   
  
Perform biological pest control or use biopesticides  
  
Adopt pasture rotation to suppress livestock pest population   
  
Systematic removal of plant parts attacked by pests  
  
Maintenance and cleansing of spray equipment after use  
  
Use one pesticide no more than two times or in mixture in a season to avoid pesticide resistance.  
  
  
  
Sustainability criteria:   
  
Farm sustainability in relation with pesticides will be assessed as follows:   
  
Green (desirable): The farm uses only moderately or slightly hazardous pesticides (WHO Class II or III). In this case, it adheres to all three health-related measures and at least four of the environment-related measures. Default result for farms not using pesticides.  
  
Yellow (acceptable): The farm uses only moderately or slightly hazardous pesticides (WHO Class II or III) and takes some measures to mitigate environmental and health risks (at least two from each of the lists above)  
  
Red (unsustainable): The farm uses highly or extremely hazardous pesticides (WHO Class Ia or Ib), illegal pesticides, or uses moderately or slightly hazardous pesticides without taking specific measures to mitigate environmental or health risks associated with their use (fewer than two from each of the lists above).   
  
  
  
Data items  
  
Reference period: last calendar year  
  
7.1 Use of pesticides for crop or livestock by the agricultural holding (Y/N)   
  
7.2 Use of highly or extremely hazardous pesticides by the agricultural holding (Y/N)  
  
7.3 Adherence to an Integrated Pest Management Programme (Y/N)  
  
7.4 Measures taken to protect people from health-related risks associated with pesticides:   
  
Adherence to label directions for pesticide use, including use of personal protection equipment (Y/N)  
  
Maintenance and cleansing of protection equipment after use (Y/N)  
  
Safe disposal of waste (cartons, bottles and bags) (Y/N)  
  
  
  
7.5 Measures taken to avoid environment-related risks associated with pesticides:  
  
Adherence to label directions for pesticide application (Y/N)  
  
Adjustment of planting time (Y/N)  
  
Application of crop spacing (Y/N)  
  
Application of crop rotation (Y/N)  
  
Application of mixed cropping (Y/N)  
  
Application of inter-cropping (Y/N)  
  
Perform biological pest control (Y/N)  
  
Use of biopesticides (Y/N)  
  
Adopting pasture rotation to suppress livestock pest population (Y/N)  
  
Systematic removal of plant parts attacked by pests (Y/N)  
  
Maintenance and cleansing of spray equipment after use (Y/N)  
  
Use one pesticide no more than two times or in mixture in a season to avoid pesticide resistance (Y/N)  
  
  
  
  
  
8. Use of agro-biodiversity-supportive practices  
  
Dimension: Environmental   
  
Theme: Biodiversity   
  
The Convention on Biological Diversity (CBD) stresses the close relationship between agriculture activities and biodiversity, considering three levels of biodiversity: genetic level diversity; agrobiodiversity at production system level; and ecosystem level (wild) biodiversity. The way agriculture is practiced influences all three levels. Attempts to develop indicators of biodiversity for agriculture systematically consider a large number of sub-indicators, with no universally agreed sustainability criteria. Considering these constraints, and the importance of addressing biodiversity in the construction of Indicator 2.4.1, it is proposed to develop a sub-indicator that captures the efforts towards more sustainable agriculture that better contributes to biodiversity, by identifying a limited list of practices that are conducive to biodiversity conservation.  
  
Coverage: All farm types   
  
Description:   
  
This sub-indicator measures the level of adoption of more sustainable agricultural practices that better contribute to biodiversity by the farm at ecosystem, species and genetic levels. This indicator addresses both crops and livestock. Specifically, in case of this sub-indicator the scope is the entire area of the farm holding as opposed to the agricultural area that is used for rest of the 10 sub-indicators.   
  
In particular, two separate scoring systems depending on the applicability of the organic farming criterion have been proposed.  
  
Depending on whether organic certification system exists, countries will select one of the below two proposed set of criteria and thus will be evaluated/scored differently in terms of their sustainability status. According to this formulation, to secure green status, farms in countries with organic certification in place, will have to check 3 out of 6 criteria. On the contrary, farms operating in countries with no organic certification in place, will have to check 2 out of 5 criteria for obtaining the green status.  
  
The detailed formulation of the criteria for the 2 scoring systems is described below:  
  
Criteria for group of countries with organic certification systems/schemes:  
  
Leaves at least 10% of the holding area for natural or diverse vegetation. This can include natural pasture/grassland, maintaining wildflower strips, stone and wood heaps, trees or hedgerows, natural ponds or wetlands.   
  
Farm produces agricultural products that are organically certified, or its products are undergoing the certification process.   
  
Farm does not use medically important antimicrobials as growth promoters.  
  
At least two of the following contribute to farm production: 1) temporary crops, 2) pasture, 3) permanent crops, 4) trees on farm, 5) livestock or animal products, and 6) aquaculture.  
  
Practices crop or crop/pasture rotation involving at least 2 crops or crops and pastures on at least 80% of the farm agriculture area (excluding permanent crops and permanent pastures) over a period of 3 years. In case of a 2-crop rotation, the 2 crops have to be from different plant genus, e.g. a grass plus a legume, or a grass plus a tuber etc.   
  
Livestock includes locally adapted breeds.  
  
  
  
Sustainability status:  
  
Green (desirable): The agricultural holding meets at least three of the above criteria   
  
Yellow (acceptable): The agricultural holding meets one or two of the above criteria  
  
Red (unsustainable): The agricultural holding meets none of the above criteria  
  
  
  
Criteria for group of countries with no organic certification systems/schemes:  
  
Leaves at least 10% of the holding area for natural or diverse vegetation. This can include natural pasture/grassland, maintaining wildflower strips, stone and wood heaps, trees or hedgerows, natural ponds or wetlands.   
  
Farm does not use medically important antimicrobials as growth promoters.  
  
At least two of the following contribute to farm production: 1) temporary crops, 2) pasture, 3) permanent crops, 4) trees on farm, 5) livestock or animal products, and 6) aquaculture  
  
Practices crop or crop/pasture rotation involving at least 2 crops or crops and pastures on at least 80% of the farm cultivated area (excluding permanent crops and permanent pastures) over a period of 3 years. In case of a 2-crop rotation, the 2 crops have to be from different plant genus, e.g. a grass plus a legume, or a grass plus a tuber etc.   
  
Livestock includes locally adapted breeds.  
  
  
  
Sustainability status:  
  
Green (desirable): The agricultural holding meets at least two of the above criteria   
  
Yellow (acceptable): The agricultural holding meets one of the above criteria  
  
Red (unsustainable): The agricultural holding meets none of the above criteria  
  
  
  
Data items  
  
Reference period: last calendar year  
  
8.1 Percentage of the holding area covered by natural or diverse vegetation (not cultivated), including natural pasture or grasslands; wildflower strips; stone or wood heaps; trees or hedgerows; natural ponds or wetlands  
  
8.2 Farm produced products (crops and/or livestock) that are organically certified (Y/N)  
  
8.3 Farm produced products (crops and/or livestock) that are undergoing organic certification (Y/N)  
  
8.4 Report the holding organic certification number  
  
8.5 Report the name of organic certifying body  
  
8.6 Area on which certified organic [CROP/LIVESTOCK] was produced  
  
8.7 Use of medically important antimicrobials as growth promoter for livestock (Y/N)  
  
8.8 Value of production of the holding (covered by sub-indicator 1)  
  
⃝ 1 Temporary crops  
  
⃝ 2 Pastures  
  
⃝ 3 Permanent crops  
  
⃝ 4 Trees on farm  
  
⃝ 5 Livestock and animal products  
  
⃝ 6 Aquaculture  
  
8.9 Percentage of the cultivated area on which crop rotation or crop/pasture rotation involving at least two crops (excluding permanent crops and permanent pastures) from different plant genus is practiced over a 3 year period  
  
8.10 Area of the agricultural holding covered by the (up to 5) main crops listed for sub-indicator 1 (excluding pasture)  
  
8.11 List of different breeds and cross-breed and percentage of animals they represent for each animal species  
  
  
  
  
  
  
  
9. Wage rate in agriculture  
  
Dimension: Social   
  
Theme: Decent employment  
  
The theme provide information on the remuneration of employees working for the farm and belonging to the elementary occupation group, as defined by the International Standard Classification of Occupation (ISCO-08 - code 92). It informs about economic risks faced by unskilled workers (those performing simple and routine tasks) in terms of remuneration received, the later benchmarked against the minimum wage set at national level in the agricultural sector. This sub-indicator allows distinguishing between holdings that pay a fair remuneration to its employees under the elementary occupation group, and agricultural holdings paying a remuneration to their employees belonging to the elementary occupation group that is below the minimum wage standard. In the latter case, agricultural holdings are deemed to be non-sustainable since the remuneration paid is not sufficient to ensure a decent living standard.  
  
Coverage: Not applicable to farms that employ only family labour.  
  
Description:   
  
The sub-indicator measures the farm unskilled labour daily wage rate in Local Currency Units (LCU).  
  
  
  
Where compensation is both monetary and in kind payments expressed in Local Currency Units (LCU)  
  
  
  
Sustainability criteria:   
  
Unskilled labour wage rate in relation to national or agriculture sector minimum wage rate. In case there is no national or agriculture sector minimum wage rate, the national poverty line is used instead:  
  
Green (desirable): If the wage rate paid to unskilled labour is above the minimum national wage rate or minimum agricultural sector wage rate (if available). Default result for farms not hiring labour.  
  
Yellow (acceptable): if the wage rate paid to unskilled labour is equals to the minimum national wage rate or minimum agricultural sector wage rate (if available).   
  
Red (unsustainable): if the wage rate paid to unskilled labour is below the minimum national wage rate or minimum agricultural sector wage rate (if available).   
  
  
  
Data items  
  
Reference period: last calendar year  
  
9.1 Unskilled workers hired on the agricultural holding (Y/N)  
  
9.2 Average pay in-cash and/or in-kind paid to the hired unskilled worker per day (of 8 hours)  
  
9.3 Minimum agricultural sector wage rate (if available) or minimum national wage rate   
  
  
  
  
  
10. Food Insecurity Experience Scale (FIES)  
  
Dimension: Social   
  
Theme: Food security   
  
FIES is a metric of severity of food insecurity at the household level that relies on people’s direct yes/no responses to eight simple questions regarding their access to adequate food. It is a statistical measurement scale similar to other widely-accepted statistical scales designed to measure unobservable traits such as aptitude/intelligence, personality, and a broad range of social, psychological and health-related conditions.   
  
Coverage: Only household farms   
  
Description:   
  
The Food Insecurity Experience Scale (FIES) produces a measure of the severity of food insecurity experienced by individuals or households, based on direct interviews.  
  
The FIES questions refer to the experiences of the individual respondent or of the respondent’s household as a whole. The questions focus on self-reported food-related behaviors and experiences associated with increasing difficulties in accessing food due to resource constraints.   
  
The FIES is derived from two widely-used experience-based food security scales: the U.S. Household Food Security Survey Module and the Latin American and Caribbean Food Security Scale (Spanish acronym ELCSA). It consists of a set of eight short yes/no questions asked directly to people. The questions focus on self-reported, food-related behaviours and experiences associated with increasing difficulties in accessing food due to resource constraints. The FIES is based on a well-grounded construct of the experience of food insecurity composed of three domains: uncertainty/anxiety, changes in food quality, and changes in food quantity.  
  
This sub-indicator is SDG indicator 2.1.2, contextualised for a farm survey.   
  
  
  
Sustainability criteria: Level on FIES scale  
  
Green (desirable): Mild food insecurity   
  
Yellow (acceptable): Moderate food insecurity   
  
Red (unsustainable): Severe food insecurity   
  
  
  
Data items  
  
Reference period: last 12 months  
  
10.1 The respondent’s recollection that he/she (or any other adult in the household) would be worried about not having enough food to eat due to lack of money or other resources  
  
10.2 The respondent’s recollection that he/she (or any adult in the household) was unable to eat healthy and nutritious food because of lack of money or other resources  
  
10.3 The respondent’s recollection that he/she (or any adult in the household) only ate a few kinds of food due to lack of money or other resources  
  
10.4 The respondent’s recollection that he/she (or any adult in the household) had to skip a meal because there was no enough money or other resources for food  
  
10.5 The respondent’s recollection that he/she (or any adult in the household) ate less than he/she thought he should due to lack of money or other resources  
  
10.6 The respondent’s recollection that he/she (or any adult in the household) ran out of food because of a lack of money or other resources  
  
10.7 The respondent’s recollection that he/she (or any adult in the household) was hungry but not eating due to lack of money or other resources for food  
  
10.8 The respondent’s recollection that he/she (or any adult in the household) did not eat for a whole day because of a lack of money or other resources  
  
  
  
  
  
11. Secure tenure rights to land  
  
Dimension: Social   
  
Theme: Land tenure  
  
The sub-indicator allows assessing sustainability in terms of rights over use of agricultural land areas. Since agricultural land is a key input for agricultural production, having secure rights over land ensures that the agricultural holding controls such a key asset and does not risk losing the land used by the holding for farming.   
  
Evidence shows that farmers tend to be less productive if they have limited access to and control of economic resources and services, particularly land. Long-lasting inequalities of economic and financial resources have positioned certain farmers at a disadvantage relative to others in their ability to participate in, contribute to and benefit from broader processes of development.   
  
As such, adequate distribution of economic resources, particularly land, help ensure equitable economic growth, contributes to economic efficiency and has a positive impact on key development outcomes, including poverty reduction, food security and the welfare of households.  
  
This sub-indicator is SDG indicator 5.a.1, customised for SDG indicator 2.4.1.   
  
Coverage: All farms types   
  
Description:   
  
The sub-indicator measures the ownership or secure rights over use of agricultural land areas using the following criteria:  
  
Formal document issued by the Land Registry/Cadastral Agency   
  
Name of the holder listed as owner/use right holder on legally recognized documents  
  
Rights to sell any of the parcel of the holding  
  
Rights to bequeath any of the parcel of the holding  
  
Sustainability criteria:   
  
Level of security of access to land.  
  
Green (desirable): has a formal document with the name of the holder/holding on it, or has the right to sell any of the parcel of the holding, or has the right to bequeath any of the parcel of the holding  
  
Yellow (acceptable): has a formal document even if the name of the holder/holding is not on it  
  
Red (unsustainable): no positive responses to any of the 4 questions above  
  
Data items  
  
Reference period: last calendar year  
  
11.1 Type of formal document for any of the agricultural land of the holder/holding that it holds (alternatively ‘possess, use, occupy) issued by the Land Registry/Cadastral Agency  
  
⃝ 1 Title deed  
  
⃝ 2 Certificate of customary tenure  
  
⃝ 3 Certificate of occupancy  
  
⃝ 4 Registered will or registered certificate of hereditary acquisitions  
  
⃝ 5 Registered certificate of perpetual / long term lease  
  
⃝ 6 Registered rental contract  
  
⃝ 7 Other  
  
  
  
11.2 Name of any member of the holding listed as an owner or use right holder on any of the legally recognized documents  
  
11.3 The right of the holder/holding to sell any of the parcel of the holding  
  
11.4 The right of the holder/holding to bequeath any of the parcel of the holding  
  
  
  
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Last updated: 02 December 2016  
  
  
  
Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture  
  
Target 2.2: by 2030 end all forms of malnutrition, including achieving by 2025 the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons  
  
Indicator 2.2.2: Prevalence of malnutrition (weight for height >+2 or <-2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)  
  
  
  
Institutional information  
  
  
  
Organization(s):  
  
  
  
United Nations Children's Fund (UNICEF)  
  
World Health Organization (WHO)  
  
World Bank (WB)  
  
  
  
Concepts and definitions  
  
  
  
Definition:  
  
Prevalence of overweight (weight for height >+2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age.  
  
  
  
Rationale:  
  
Child growth is an internationally accepted outcome area reflecting child nutritional status. Child overweight refers to a child who is too heavy for his or her height. This form of malnutrition results from expending too few calories for the amount of food consumed and increases the risk of noncommunicable diseases later in life. Child overweight is one of the World Health Assembly nutrition target indicators.  
  
  
  
Concepts:  
  
The official MDG indicator is overweight as assessed using weight for height. Overweight can however also be assessed with other indicators such body mass index for age. In general BMI for age is not used in the joint dataset but has been considered in absence of any other available estimates.   
  
  
  
Comments and limitations:  
  
Survey estimates come with levels of uncertainty due to both sampling error and non-sampling error (e.g. mesasurement technical error, recording error etc.,). None of the two sources of errros have been fully taken into account for deriving estimates neither at country nor at regional and global levels. Of particular concern for overweight is the fact that data for high income countries are scarce yet the rates are generally higher among the high income countries with data and so the lack of representation from high income countries may affect the global and even regional rates.  
  
  
  
  
  
  
Methodology  
  
  
  
Computation Method:  
  
Survey estimates are based on standardized methodology using the WHO Child Growth Standards as described elsewhere (Ref: Anthro software manual). Global and regional estimates are based on methodology outlined in UNICEF-WHO-The World Bank: Joint child malnutrition estimates - Levels and trends (UNICEF/WHO/WB 2012 )  
  
  
  
Disaggregation:  
  
Global and regional estimates refer to the age group of children under 5 years, sexes combined. Disaggregated country data are available in a majority of household surveys and UNICEF - WHO- The World Bank Group are expanding the joint data set to include sub national and stratified estimates (e.g. sex, age groups, wealth, mothers' education, residence) in 2017.  
  
  
  
Treatment of missing values:  
  
  
  
At country level  
  
No imputation methodology is applied to derive estimates for countries or years where no data is avaialble.  
  
  
  
At regional and global levels  
  
Countries and years are treated as missing randomly following a multilevel modeling approach (International Journal of Epidemiology 2004;33:1260-70).  
  
  
  
Regional aggregates:  
  
Regional aggregates are available for the following classifications: UN, MDG, UNICEF, WHO, The World Bank regions and income groups.  
  
  
  
Sources of discrepancies:  
  
The standard analysis approach to construct the joint data set aims for a maximum comparability of country estimates. For the inclusion of survey estimates into the JME dataset, the inter-agency group applies survey quality assessment criteria. When there is insufficient documentation, the survey is not included until information becomes available. When raw data are available, and there is a question about the analysis approach, data re-analysis is performed following the standard methodology. Discrepancies between results from standardised approach and those reported may occur for various reasons, for example, the use of different standards for z-score calculations, imputation of the day of birth when missing, the use of rounded age in months, the use of different flagging systems for data exclusion. For surveys based on the previous NCHS/WHO references, and for which raw data are not available, a method for converting the z-scores to be based on the WHO Child Growth Standards is applied (Yang and de Onis, 2008). In addition, when surveys do not cover the age interval 0-<5 years, or are only representative of the rural areas, an adjustment based on other surveys for the same country, is performed. Any adjustment or conversion is transparently stated in the annotated joint data set.  
  
  
  
  
  
  
Data Sources  
  
  
  
Description:  
  
For the majority of countries, nationally representative household surveys constitute the data source. For a limited number of countries data from surveillance systems is used if sufficient population coverage is documented (about 80%). For both data sources, the child’s height and weight measurements have to be collected following recommended standard measuring techniques (WHO 2008).   
  
  
  
Collection process:  
  
UNICEF, WHO and the World Bank group jointly review new data sources to update the country level estimates. Each agency uses their existing mechanisms for obtaining data.  
  
For WHO, see published database methodology (de Onis et al. 2004). For UNICEF, the cadre of dedicated data and monitoring specialists working at national, regional and international levels in 190 countries routinely provide technical support for the collection and analysis of data. For the past 20 years UNICEF has undertaken an annual process to update its global databases, called Country Reporting on Indicators for Goals (CRING). This exercise is done in close collaboration with UNICEF country offices with the purpose of ensuring that UNICEF global databases contain updated and internationally comparable data. UNICEF country offices are invited to submit, through an online system, nationally representative data for over 100 key indicators on the well-being of women and children, including stunting. The country office staff work with local counterparts to ensure the most relevant data are shared. Updates sent by the country offices are then reviewed by sector specialists at UNICEF headquarters to check for consistency and overall data quality of the submitted estimates and re-analysis where possible. This review is based on a set of objective criteria to ensure that only the most reliable information is included in the databases. Once reviewed, feedback is made available on whether or not specific data points are accepted, and if not, the reasons why. UNICEF uses these data obtained through CRING to feed into the joint dataset. The World Bank Group provides estimates availabe through the Living Standard Measurement Surveys (LSMS) which ussually requires re-analysis of datasets given theat the LSMS reports often do not tabulate the stunting data.   
  
  
  
  
  
Data Availability  
  
  
  
Description:  
  
More than 150 countries.  
  
  
  
Time series:  
  
At country level, data are provided for the years where surveys are included in the joint dataset. Survey years range from 1983 to 2016. For the global and regional levels, estimates for the years 1990 to the latest available estimate upon release each year (i.e. in Sept 2016 edition of the Joint Malnutrition Estimates the latest available estimate was for 2015).   
  
  
  
  
  
  
Calendar  
  
  
  
Data collection:  
  
 Data sources are currently being updated to feed into the 2017 production of global and regional estimates and updated country level dataset to be released in May 2017.   
  
   
  
Data release:  
  
The next planned release fo global/regional estimates as well as the updated country dataset is May 2017. Global and regional estimates are released annually every May starting in 2017. The country level dataset is updated and released more often than the global/regional estimates. Although a set schedule has not yet been established, there have been at least two annual updates (one coinciding with the annual release of the regional/global estimates and at least one other update at another time of the year).  
  
  
  
  
  
Data providers  
  
Data providers vary and most commonly are ministries of health, national offices of statistics or national institutes of nutrition.   
  
  
  
  
  
Data compilers  
  
UNICEF, WHO and the World Bank group  
  
  
  
  
  
References  
  
Please provide links to all references for this indicator.  
  
  
  
URL:  
  
data.unicef.org/nutrition/malnutrition.html; http://www.who.int/nutgrowthdb/estimates2014/en/; http://datatopics.worldbank.org/child-malnutrition;  
  
  
  
References:  
  
United Nations Children’s Fund, World Health Organization, The World Bank (2012). UNICEFWHO-World Bank Joint Child Malnutrition Estimates. (UNICEF, New York; WHO, Geneva; The World Bank, Washington, DC; 2012).   
  
de Onis M, Blössner M, Borghi E, et al. (2004), Methodology for estimating regional and global trends of childhood malnutrition. Int J Epidemiol, 33(6):1260-70.  
  
Yang H and de Onis M. Algorithms for converting estimates of child malnutrition based on the NCHS reference into estimates based on the WHO Child Growth Standards   
BMC Pediatrics 2008, 8:19 (05 May 2008)   
(http://www.biomedcentral.com/1471-2431/8/19).  
  
World Health Organization (2008). Training Course on Child Growth Assessment. Geneva, WHO, 2008.  
  
International Journal of Epidemiology 2004;33:1260-70  
  
International Journal of Epidemiology 2003;32:518-26  
  
http://www.biomedcentral.com/1471-2431/8/19  
  
  
  
  
  
Related indicators as of February 2020

Last updated: March 2020  
  
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture   
  
Target 2.1: By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round   
  
Indicator 2.1.1: Prevalence of undernourishment   
  
  
  
Institutional information   
  
  
  
Organization(s):   
  
Food and Agriculture Organization of the United Nations (FAO)   
  
  
  
Concepts and definitions   
  
  
  
Definition:   
  
  
  
The prevalence of undernourishment (PoU) (French: pourcentage de sous-alimentation; Spanish: porcentaje de sub-alimentación; Italian: prevalenza di sotto-alimentazione) is an estimate of the proportion of the population whose habitual food consumption is insufficient to provide the dietary energy levels that are required to maintain a normal active and healthy life. It is expressed as a percentage.   
  
  
  
Rationale:   
  
  
  
The indicator has been used by FAO to monitor the World Food Summit Target and the MDG Target 1C, at national, regional and global level, since 1999. It allows monitoring trends in the extent of dietary energy inadequacy in a population over time, generated as a result of the combination of changes in the overall availability of food, in the households’ ability to access it, and in the socio-demographic characteristics of the population, as well as differences across countries and regions in any given moment in time.   
  
  
  
The parametric approach adopted by FAO allows obtaining reliable estimated for relatively large population groups. As it reflects a severe condition of lack of food, it is fully consistent with the spirit of a Goal that aims at reducing hunger.   
  
  
  
Concepts:   
  
  
  
Undernourishment is defined as the condition by which a person has access, on a regular basis, to amounts of food that are insufficient to provide the energy required for conducting a normal, healthy and active life, given his or her own dietary energy requirements.   
  
  
  
Though strictly related, “undernourishment” as defined here is different from the physical conditions of “malnutrition” and “undernutrition” as it refers to the condition of insufficient intake of food, rather than to the outcome in terms of nutritional status. In French, Spanish and Italian the difference is marked by the use of the terms alimentation, alimentación, or alimentazione, instead of nutrition, nutrición or nutrizione, in the name of the indicator. A more appropriate expression in English that would render the precise meaning of the indicator might have been “prevalence of under-feeding” but by now the term “undernourishment” has long been associated with the indicator.   
  
  
  
While the undernourishment condition applies to individuals, due to conceptual and data-related considerations, the indicator can only be referred to a population, or group of individuals. The prevalence of undernourishment is thus an estimate of the percentage of individuals in a group that are in that condition, but it does not allow for the identification of which individuals in the group are, in fact, undernourished.   
  
  
  
Comments and limitations:   
  
  
  
Over the years, the parametric approach informing the computation of the PoU has been criticized, based on the presumptions that undernourishment should be assessed necessarily starting at the individual level, by comparing individual energy requirements with individual energy intakes. According to such view, the prevalence of undernourishment could be simply computed by counting the number of individuals in a representative sample of the population that is classified as undernourished, based on a comparison of individual habitual food consumption and requirements. Unfortunately, such approach is not feasible for two reasons: first, due to the cost of individual dietary intake surveys, individual food consumption is measured only in a few countries, every several years, on relatively small samples; moreover, individual energy requirements are practically unobservable with standard data collection methods (to the point that observed habitual energy consumption of individuals in a healthy status is still the preferred way to infer individual energy requirements). This means that even if it were possible to obtain accurate observations of the individual dietary energy consumption, this would be insufficient to infer on the undernourishment condition at individual level, unless integrated by the observation on the physical status (body mass index) and of its dynamic over time, of the same individual.   
  
  
  
The model based approach to estimate the PoU developed by FAO integrates information that is available with sufficient regularity from different sources for most countries in the world, in a theoretically consistent way, thus providing what is still one of the most reliable tools to monitor progress towards reducing global hunger.   
  
  
  
Further specific consideration   
  
  
  
Feasibility   
  
  
  
Estimation of PoU at national level has been feasible for most countries in the world since 1999. In the worst case scenario, when no data on food consumption was available from a recent household survey, the model-based estimate of the PoU is informed by an estimate of mean level of dietary energy consumption (DEC) from Food Balance Sheets (FBS), an indirect estimate of the coefficient of variation (CV) based on information on the country’s GDP, Gini coefficient of Income, an index of the relative price of food, or other indicators of development such as country’s Under 5 Mortality Rate, and an estimate of the Minimum Dietary Energy Requirement (MDER) based on the UN Population Division’s World Population Prospects data.   
  
  
  
Reliability   
  
  
  
Reliability mostly depends on the quality of the data used to inform the estimation of the model’s parameters.   
  
  
  
DEC could be estimated either from survey data or from food balances. Neither source is devoid of problems. When comparing estimates of national DEC from FBS and from surveys, differences are frequently noted.   
  
  
  
DEC estimates from survey data can be affected by systematic measurement errors due to under-reporting of food consumption, or to incomplete recording of all food consumption sources. Recent research shows that a negative bias of up to more than 850 kcal can be induced on the estimated daily per capita caloric consumption can be induced by the type of food consumption module chosen to capture the data at the household level. (See De Weerdt et al., 2015, Table 2, https://feb.kuleuven.be/drc/licos/publications/dp/DP%20365%20Complete.pdf ). A detailed analysis of a recent Household Budget Survey in Brazil revealed how food provided for free through the school meals program and consumed by children while at school, had not been accounted among the sources of household food consumption, accounting for a downward bias of the average per capita daily dietary energy consumption of 674 kcal. (See Borlizzi, Cafiero & Del Grossi, forthcoming.)   
  
  
  
DEC estimates from Food Balance Sheets can also be affected by errors, though it is difficult to establish the direction of induced bias. As average food availability is a residual in the FBS method, any errors in reported production, trade, and stocks might affect the estimates of national food availability. Moreover, errors might be induced by the difficulty in properly accounting for all forms of food commodity utilization. To the extent that all these errors are uncorrelated, though, the impact on the estimated average food consumption will be lower than each of the errors, considered separately, might imply. Nevertheless, considering how problematic it is to precisely account for variations in national reserves of food commodities, for which official data may be unreliable, it is recognized that the estimated annual stock variation is prone to considerable uncertainty that would be transferred to the estimated DEC in each given year.   
  
  
  
To limit the impact of such errors, FAO has traditionally presented estimates of PoU at national level as three-year averages, on the presumption that errors induced by imprecise recording of stocks variations in each single year might be highly reduced when considering an average over three consecutive years.   
  
  
  
Survey data are the only source to estimate the CV and Skewness. As described in the section of metadata on the method of computation, unless obtained from high quality individual dietary intake surveys, data needs to be treated to reduce the likely upward bias in the estimates of the CV that would be induced by the spurious variability due to errors in measuring individual habitual dietary energy intake.   
  
  
  
Comparability   
  
  
  
If the same method of computation is used, comparability across time and space is relatively high, with the only potential cause of inhomogeneity found in the different quality of the background data.   
  
  
  
Limitations   
  
  
  
Due to the probabilistic nature of the inference and the margins of uncertainty associated with estimates of each of the parameters in the model, the precision of the PoU estimates is generally low. Even though it is not possible to compute theoretical Margins of Error (MoE) for PoU estimates, these would very likely exceed plus or minus 2.5% in most cases. For this reason, FAO publishes national level PoU estimates only when they are larger than 2.5%. This also suggests that 2.5% is the lowest feasible target that can be set for the PoU indicator, a value that is unsatisfactorily large when the ambition is to fully eradicate the scourge of hunger.   
  
  
  
If no survey is available that collects food consumption data and that is representative at subnational level, the indicator can only be computed at national level."   
  
  
  
Methodology   
  
  
  
Computation Method:   
  
  
  
The indicator is computed at the population level. To this aim, the population is represented by an “average” individual for which a probability distribution of the habitual daily dietary energy intake levels is modelled through a parametric probability density function (pdf).   
  
  
  
Once the pdf is characterized, the indicator is obtained as the cumulative probability that daily habitual dietary energy intakes (x) are below the lower bound of the range of normal dietary energy requirements for that representative, or average individual (MDER), as in the formula below:   
  
  
  
PoU= ∫\_(x<MDER) f(x | DEC; CV; Skew) dx   
  
  
  
where DEC, CV and Skew are the mean, coefficient of variation and skewness that characterize the distribution of habitual dietary energy consumption levels in the population.   
  
  
  
Until 2012, the probability distribution f(x) was modelled as a Log-normal pdf, informed by only two parameters: mean and coefficient of variation. In its most recent formulation, it is modelled as a three-parameter pdf, able to represent different degrees of skewness, ranging from that of a symmetric Normal distribution to that of the positively skewed Log-normal distribution. The flexibility in capturing different degrees of skewness is needed to take into account the fact that human energy consumption levels are naturally bounded by physiological limits. It is thus conceivable that, as mean consumption levels increases, the skewness of the distribution decreases, gradually moving from (positively skewed) Log-normal distributions, typical of populations where average food consumption is relatively low, towards (symmetric) Normal distributions. The skew-normal and skew-lognormal families of distribution allow for the characterization of all possible intermediate degrees of positive skewness. (See http://www.fao.org/3/a-i4046e.pdf for a detailed description)   
  
  
  
A custom R function is available from the Statistics Division at FAO to compute the PoU, given the four parameters DEC, CV, Skew and MDER.   
  
  
  
Different data sources can be used to estimate the different parameters of the model.   
  
  
  
DEC   
  
The mean of the distribution of dietary energy consumption levels for the average individual in a population (DEC) corresponds, by definition, to the average, daily per capita food consumption level in the population.   
  
  
  
DEC can be estimated from data on food consumption obtained through surveys that are representative of the population of interest. Depending on the survey design, they can be used to estimate DEC at national and at sub national levels, either by geographic areas or by socio-economic population groups. Unfortunately, though the situation is rapidly improving, representative surveys that collect food consumption data are still not available for every country and every year.   
  
  
  
For the national population only, DEC can be estimated also from accounts of the total supply and utilization of all food commodities in a country, where the contribution of each commodity to the availability of food for human consumption is expressed in their dietary energy content, and their total is divided by the size of the population. The major source of data on national food balances are the Food Balance Sheets (FBS) maintained by FAO for most countries in the world (see http://www.fao.org/economic/ess/fbs/en/), informed by official data reported by member countries, and disseminated through FAOSTAT (http://faostat3.fao.org/download/FB/\*/E)   
  
  
  
CV   
  
Surveys that contain information on food consumption at individual or household level are the only available source to directly estimate the CV of habitual food consumption for the representative individual in the population. Unfortunately, survey data on food consumption are fraught by many problems that complicate the reliable estimation of CV.   
  
  
  
In principle, repeated observations of daily consumption for each individual in a sample would be needed to estimate levels of habitual consumption and to control for measurement errors. Moreover, data should be collected in different periods of the year on the same individuals or households to account for possible seasonal variation in levels of dietary energy consumption. Due to their cost, nationally representative individual dietary intake surveys with such characteristics are very rare, and virtually inexistent for most developing countries. As a consequence, the most common sources of data to estimate CV are multipurpose household surveys, such as Living Standard Measurement Surveys, Household Incomes and Expenditure Surveys (or Household Budgets Survey), that collect also information on food consumption. When using data collected at household level however, careful attention should be taken in distinguishing levels of food purchases or acquisitions from levels of actual utilization (consumption and wastage) during the identified reference period and in properly recording the number of individuals who participate in consumption; moreover, household level data will mask the variability due to intra-household allocation of food.   
  
  
  
For all these reasons, the coefficient of variation calculated on the series of average per capita daily dietary energy consumption levels recorded for each household included in a survey is never a reliable estimate of CV, which should reflect variability in the levels of habitual (and not occasional) daily dietary energy consumption level, at the individual (and not household) level. Empirical estimates of CV from household survey data are upward biased due to the spurious variability induced by measurement error, differences between occasional and habitual consumption, differences between acquisition and actual consumption and seasonality; moreover, they do not reflect the variability in dietary energy consumption in the population associated with individual characteristics of the household members (such as sex, age, body mass and physical activity levels).   
  
  
  
When using data collected through household surveys, CV is thus best estimated indirectly, controlling for spurious variability, and adjusted to reflect inter-individuals (in addition to inter-households) variability. The simplest way to proceed is to classify households into homogeneous groups and to calculate the coefficient of variation of the average per capita dietary energy consumption across household groups. This yields an estimate of the inter-households component of CV, labelled CV\_H. An estimate of the inter-individuals component of the CV, labelled CV\_I, is obtained, for each population, from its structure by sex, age and body masses, and the two components are combined to obtain the needed estimate as:   
  
  
  
CV^ = v[(CV\_H)^2+(CV\_I)^2 )].   
  
  
  
For countries and years when no data from household survey are available, an indirect estimate of the CV, CV\_IND, is obtained via a regression that projects the values of per capita GDP, Gini coefficient of income, and an index of the relative price of food (FPI) on the CV, while controlling for a regional shifter (REG).   
  
  
  
CV^\_IND=ß\_0+ß\_1 GDP+ ß\_2 GINI+ ß\_3 FPI+ß\_4 REG.   
  
  
  
Coefficients of the regression are estimated from the set of data and years for which data on CV, GDP, GINI and FPI are available.   
  
  
  
Skew   
  
As skewness is not strongly affected by the presence of spurious variability, Skew is estimated directly from household level data on the average daily dietary consumption, with the only exception of eliminating rare extremely high or extremely low values. If the empirically estimated skewness exceeds the value that would correspond to the skewness of Log-normal distribution with given mean and coefficient of variation, the parameter is neglected and a two parameter lognormal distribution is used for f(x). (See http://www.fao.org/3/a-i4046e.pdf for additional details).   
  
  
  
MDER   
  
Human energy requirements are computed by multiplying normative requirements for basic metabolic rate (BMR, expressed per kg of body mass) by the ideal weight of a healthy person of given height, and then multiplied by a coefficient of physical activity level (PAL). Ranges of normal energy requirements are thus computed for each sex and age group of the population, observing that there exist a whole range of Body Mass Index (BMI) values – from 18.5 to 25 – that are compatible with health. This implies that any given attained height might correspond to a whole range of healthy body weights, and therefore to a range of values for energy requirement for BMR.   
  
  
  
Given information on the median height and the consideration that the group might contain individuals engaged in different levels of physical activity, the minimum, average and maximum dietary energy requirement can be computed for every sex and age class by taking into consideration special allowances for growth in individuals aged 0-21 and for pregnancy and lactation.   
  
(See ftp://ftp.fao.org/docrep/fao/007/y5686e/y5686e00.pdf for further details).   
  
  
  
The MDER for a given population group, including for the national population, is obtained as the weighted average of the minimums of the energy requirements ranges of each sex and age class, using the population size in each class as weights.   
  
  
  
In computing the prevalence of dietary energy inadequacy in a population there has often been confusion between the concept of MDER and that of the Recommended Dietary Energy Intake, and regarding the appropriate threshold to be used to compute the probability of inadequacy. The reason why the probability of dietary energy inadequacy should be computed with reference to the MDER, and not the ADER (which, instead, can be used as an estimate of the average recommended dietary intake level for the whole population) is simply to recognize the fact that in any population there exists a certain range of normal variability in requirements; using the ADER as a threshold would greatly overestimate undernourishment as it would count also the proportion of the healthy population that consumes less than average, simply because of having less than average requirements. When needed, the ADER, or the average Recommended Dietary Energy Intake level in a population must be used instead to compute the dietary energy gap."   
  
  
  
Disaggregation:   
  
  
  
Due to reliance on national Food Balance Sheets data to estimate mean caloric consumption levels in the population, the global monitoring of MDG Target 1C and of the WFS target has been based on estimates of the PoU at national level only.   
  
  
  
In principle, the indicator can be computed for any specific population group, provided sufficient accurate information exists to characterize the model’s parameters for that specific group, that is, if data on the group’s food consumption levels, age/gender structure and – possibly – physical activity levels, exist.   
  
  
  
The scope for disaggregation thus crucially depends on the availability of surveys designed to be representative at the level of sub national population groups. Given prevailing practice in the design of national household surveys, sufficient reliable information is seldom available for disaggregation beyond the level of macro area of residence (urban-rural) and of the main Provinces/Divisions in a country. To the extent that most of the used surveys are designed to accurately capture the distribution of income, inference can be drawn on the PoU in different income classes of the population. Gender disaggregation is limited by the possibility to identify and group households by gender-related information (such as sex of the head of the household, or male/female ratio).   
  
  
  
Treatment of missing values:   
  
  
  
At country level   
  
  
  
When no data on food consumption is available from a recent household survey, the model-based estimate of the PoU is informed by an estimate of DEC from Food Balance Sheets, an indirect estimate of CV based on information on the country’s GDP, Gini coefficient of Income, an index of the relative price of food, or other indicators of development such as country’s Under 5 Mortality Rate, and an estimate of the MDER based on the UN Population Division’s World Population Prospects data.   
  
  
  
See the section on method of computation for details.   
  
  
  
At regional and global levels   
  
  
  
Missing values for individual countries are implicitly imputed to be equal to the population weighted average of the estimated values of the countries present in the same region.   
  
  
  
Regional aggregates:   
  
  
  
Regional and global aggregates of the PoU are computed as:   
  
  
  
PoU\_REG = (\_i PoU\_i × N\_i) / (\_i N\_i)   
  
  
  
where PoU\_i are the values of PoU estimated for all countries in the regions for which available data allow to compute a reliable estimate, and N\_i the corresponding population size.   
  
  
  
Sources of discrepancies:   
  
  
  
Many countries have produced and reported on estimates of the Prevalence of Undernourishment, including in their national MDG Reports, but almost invariably using a different methodology than the one developed by FAO, which makes national figures not comparable to those reported by FAO for global monitoring.   
  
  
  
The most common approach used in preparing national reports has been to calculate the percentage of households for which the average per capita daily dietary energy consumption is found to be below thresholds based on daily Recommended Dietary Intake, usually set at 2,100.00 kcal, based on household survey data. In some cases, also lower thresholds of around 1,400.00 kcal have been used, probably as a reaction to the fact that percentages of households reporting average daily consumption of less than 2,100.00 kcal per capita were implausibly high estimates of the prevalence of undernourishment.   
  
  
  
Almost without exception, no consideration related to the presence of excess variability in the dietary energy consumption data is made, and the reports reveal limited or no progress in the reduction of PoU over time.   
  
  
  
As discussed in the section on the method of computation, the results obtained through these alternative methods are highly unreliable and almost certainly biased toward overestimation. It is therefore advisable that a concerted effort is made to advocate for use of the FAO methods also in preparation of national reports. FAO stands ready to provide all necessary technical support.   
  
  
  
Methods and guidance available to countries for the compilation of the data at the national level:   
  
  
  
The main three sources of data at national level are:   
  
a) Official reports on the production, trade and utilization of the major food crop and livestock productions.   
  
b) Household survey data on food consumption   
  
c) Demographic characteristics of the national population   
  
  
  
Data sources for agricultural production are usually national surveys that are conducted by the Ministry of Agricultural/Livestock and/or the National Statistical Office. The surveys are usually annual, and in the absence of direct measurements, use information on areas/animal numbers and crop yields/carcass weights to calculate crop or livestock product quantities. Agricultural censuses, which FAO recommends conducting every ten years, may complement these surveys by providing more updated measured data on crops and livestock, and thus enable more precise projections/revisions.   
  
  
  
The data source for agricultural and food trade is almost exclusively the national customs office (with few exceptions where data may be obtained from the Central Bank). Countries often prepare these trade reports following international standard formats (commodity/country classifications, units of measurement, trading partner detail). While such trade data may be considered quite reliable, being the result of direct measurement/reporting by/to the customs office, issues of unreported border trade (and animal movement), misclassification of commodities, confidentiality, time-lag, to name a few, may necessitate some data analysis and validation (often by referring to ‘ mirror’ trade statistics to cross-check quantities and values).   
  
  
  
Data on the utilization of primary and processed crops and livestock may be obtained through specialized surveys (supplemented by research) through the national agri-food industry system. Utilizations of interest here are those quantities destined for, among others, animal feed, for industrial uses (e.g. biofuel production), for national/enterprise/farm stocks, for seed (sowing for the successive agricultural cycle) – to enable as accurate an assessment as possible of the quantities destined/available for potential human consumption.   
  
  
  
These datasets (production, trade and utilizations), once cross-checked and validated, form the basis for the compilation of the Food Balance Sheets (FBS). The FBS are an accounting framework whereby supply (production + imports + stock withdrawals) should equal utilization (export + food processing + feed + seed + industrial use, etc.). It should be noted that, within the FBS framework, post-harvest/slaughter losses (up to the retail level) are considered as utilization, and thus a component in the balancing of the FBS. The FBS framework provides a snapshot of the agricultural supply situation at the national level, and allows for a cross-referenced structure whereby data, official or estimated/imputed, may be further analyzed and validated (e.g. animal numbers may result as being under-reported/estimated). The main result of the compilation of the FBS is the calculation of the Dietary Energy Supply (DES) in kilocalories per person (based on population figures) in a given year (quantities resulting as available for human consumption are converted into their caloric equivalents by using appropriate nutritive conversion factors by commodity). The DES, in the absence of direct consumption data from household surveys, is one of the key components in the calculation of the Prevalence of Undernourishment (PoU). FAO is presently embarking on a more focused program of providing FBS capacity to countries, including an updated compilation tool.   
  
  
  
FAO obtains crop/livestock primary/processed production data, and principal utilization thereof, through country-tailored questionnaires that are dispatched to all countries annually. Official country trade statistics are obtained annually through bulk downloads of the United Nations trade database (countries are expected to report to UNSD annually). In some cases, when available, national FBS data are also used. These datasets are then validated and form inputs in the country FBS which FAO compiles. It should be noted that when data are not officially reported/available (as is frequently the case with commodity utilization data), and hence it is necessary to resort to imputations to fill the data gaps.   
  
  
  
The new FBS Guidelines for national compilation (completed recently in collaboration with the Global Strategy) and new compilation tool (R-based ‘shiny’ application).   
  
  
  
Detail on FBS methodology: http://www.fao.org/economic/ess/fbs/ess-fbs02/en/.   
  
The FBS Handbook shown here should not be confused with the recently completed FBS Guidelines. The Handbook is of a more technical nature and explains the methodology followed by FAO in compiling country FBS. The Guidelines on the other hand, while based on the Handbook, provide countries with a more revised and practical guidance and recommendations for compilation at the national level.   
  
  
  
Some FBS background text also available on FAOSTAT: http://www.fao.org/faostat/en/#data/FBS.   
  
  
  
Quality assurance   
  
  
  
FBS capacity development programme in cooperation with the Global Strategy (more details may be provided if required); capacity development in cooperation with the ESS Food Security team as a PoU/FBS package (financed by projects); and direct FBS capacity development based on specific direct country requests.   
  
  
  
Data Sources   
  
  
  
Description:   
  
  
  
The ideal source of data to estimate the PoU would be a carefully designed and skillfully conducted individual dietary intake survey, in which actual daily food consumption, together with heights and weights for each surveyed individual, are repeatedly measured on a sample that is representative of the target population. Due to their cost, however, such surveys are rare.  
  
  
  
In principle, a well-designed household survey that collects information on food acquisitions might be sufficient to inform a reliable estimate of the Prevalence of Undernourishment in a population, at a reasonable cost and with the necessary periodicity to inform the SDG monitoring process, provided that:   
  
  
  
All sources of food consumption for all members of the households are properly accounted for, including, in particular, food that is consumed away from home;   
  
  
  
Sufficient information is available to convert the data on food consumption or on food expenditures into their contribution to dietary energy intake;   
  
  
  
The proper methods to compute the PoU are used, to control for excess variability in the estimated levels of habitual food consumption across households, allowing for the presence on normal variability in the distribution of food consumption across individuals, induced by the differences in energy requirements of the members of the population.   
  
  
  
Examples of surveys that could be considered for this purpose include surveys conducted to compute economic statistics and conduct poverty assessments, such as Household Income and Expenditure Surveys, Household Budget Surveys and Living Standard Measurement Surveys.   
  
  
  
In practice, however, it is often impossible, and not advisable, to rely only on data collected through a household survey, as the information needed to estimate the four parameters of the PoU model is either missing or imprecise.   
  
  
  
Household Survey food consumption data often must be integrated by   
  
a) Data on the demographic structure of the population of interest by sex and age;   
  
b) Data or information on the median height of individuals in each sex and age class;   
  
c) Data on the distribution of physical activity levels in the population;   
  
d) Alternative data on the total amounts of food available for human consumption, to correct for biases in the estimate of the national average daily dietary energy consumption in the population.   
  
  
  
Data for a), b) and c) could be available through the same multipurpose survey that provides food consumption data, but are more likely available from other sources, such as National Demographic and Health Surveys (for a) and b) ) and Time Use Surveys (for c) ).   
  
  
  
Correcting for bias in the estimated average daily dietary energy consumption might need to be based on alternative sources on food consumption, such as aggregate food supply and utilization accounts and food balance sheets.   
  
  
  
To inform its estimate of PoU at national, regional and global level, in addition to all household surveys for which it is possible to obtain micro data on food consumption, FAO relies on:   
  
a) UN Population Division’s World Population Prospects (https://esa.un.org/unpd/wpp/Download/Standard/Population/), which provide updated estimates of the structures of the national population by sex and age every two years for most countries in the world;   
  
b) FAO Food Balance Sheets (http://faostat3.fao.org/download/FB/\*/E), which provides updated estimates of the national availability of food every year for most countries in the world.  
  
  
  
Micro data from household surveys that collect food consumption data are sourced by FAO directly through the National Statistical Agencies’ websites, or through specific bilateral agreements."   
  
  
  
 Collection process:   
  
   
  
Official information on food commodity production, trade and utilization used by FAO to compile Food Balance Sheets is provided mainly by Statistical Units of the Ministry of Agriculture. FAO sends out a data collection questionnaire every year to an identified focal point.   
  
  
  
Microdata of household surveys are generally owned and provided by National Statistical Agencies. When available, data is sourced by FAO directly through the NSA’ website. In several cases, when microdata is not available in the public domain, bilateral agreements have been signed, usually in the contexts of technical assistance and capacity development programs.   
  
  
  
Data on the population size and structure for all monitored countries is obtained from the UN Population Division’s World Population Prospects.   
  
  
  
Data Availability   
  
  
  
Description:   
  
  
  
Since 2017 FAO has reported separate estimates of PoU for 170 countries, distributed as follows:   
  
  
  
World 170   
  
 Africa 45   
  
 Northern Africa 5   
  
 Sub-Saharan Africa 40   
  
 Eastern Africa 12   
  
 Middle Africa 7   
  
 Southern Africa 5   
  
 Western Africa 16   
  
 Asia 42   
  
 Central Asia 5   
  
 Eastern Asia 5   
  
 Southern Asia 8   
  
 South-Eastern Asia 10   
  
 Western Asia 14   
  
 Latin America and the Caribbean 32   
  
 Caribbean 12   
  
 Latin America 20   
  
 Central America 8   
  
 South America 12   
  
 Oceania 9  
  
Australia and New Zealand 2  
  
Oceania excluding Australia and New Zealand 7  
  
 Northern America and Europe 42  
  
Northern America 3  
  
Europe 39  
  
 Eastern Europe 10  
  
 Northern Europe 10  
  
 Southern Europe 12  
  
 Western Europe 7  
  
  
  
While country-level estimates are presented as three-year averages, regional and global estimates are yearly estimates.   
  
  
  
Time series:   
  
  
  
2000 - current   
  
  
  
Calendar   
  
  
  
Data collection:   
  
  
  
Continuing   
  
  
  
Data release:   
  
  
  
September 2019   
  
  
  
Data providers   
  
  
  
Given the various data sources, national data providers vary. Official information on food commodity production, trade and utilization used by FAO to compile Food Balance Sheets is provided mainly by Statistical Units of the Ministry of Agriculture. Microdata of household surveys are generally owned and provided by National Statistical Agencies.   
  
  
  
Data compilers   
  
  
  
Food and Agriculture Organization of the United Nations, Statistics Division, Food Security and Nutrition Statistics Team   
  
  
  
References   
  
  
  
URL:   
  
  
  
http://www.fao.org/economic/ess/ess-fs/en/   
  
  
  
References:   
  
  
  
http://www.fao.org/docrep/012/w0931e/w0931e16.pdf   
  
http://www.fao.org/docrep/005/Y4249E/y4249e06.htm#bm06   
  
http://www.fao.org/3/a-i4060e.pdf   
  
http://www.fao.org/3/a-i4046e.pdf   
  
  
  
Related indicators as of February 2020  
  
  
  
2.2, 2.2.1   
  
  
  
Comments:   
  
  
  
Links with Target 2.2, to the extent that hunger is the extreme form of malnutrition, and Target 2.2 cannot be considered achieved unless Target 2.1 is achieved too.

Last updated: 09 July 2017  
  
  
  
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture  
  
Target 2.a: Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries  
  
Indicator 2.a.2: Total official flows (official development assistance plus other official flows) to the agriculture sector  
  
  
  
Institutional information  
  
  
  
Organization(s):  
  
  
  
Organisation for Economic Co-operation and Development (OECD)  
  
  
  
Concepts and definitions  
  
  
  
Definition:  
  
  
  
Gross disbursements of total ODA and other official flows from all donors to the agriculture sector.  
  
  
  
Rationale:  
  
  
  
Total ODA and OOF flows to developing countries quantify the public effort (excluding export credits) that donors provide to developing countries for agriculture.  
  
  
  
Concepts:  
  
  
  
ODA: The DAC defines ODA as “those flows to countries and territories on the DAC List of ODA Recipients and to multilateral institutions which are   
  
provided by official agencies, including state and local governments, or by their executive agencies; and   
  
each transaction is administered with the promotion of the economic development and welfare of developing countries as its main objective; and  
  
is concessional in character and conveys a grant element of at least 25 per cent (calculated at a rate of discount of 10 per cent). (See http://www.oecd.org/dac/stats/officialdevelopmentassistancedefinitionandcoverage.htm)  
  
  
  
Other official flows (OOF): Other official flows (excluding officially supported export credits) are defined as transactions by the official sector which do not meet the conditions for eligibility as ODA, either because they are not primarily aimed at development, or because they are not sufficiently concessional.  
  
(See http://www.oecd.org/dac/stats/documentupload/DCDDAC(2016)3FINAL.pdf, Para 24).  
  
  
  
The agriculture sector is as defined by the DAC and comprises all CRS sector codes in the 311 series (see here: http://www.oecd.org/dac/stats/purposecodessectorclassification.htm)  
  
  
  
Comments and limitations:  
  
  
  
Data in the Creditor Reporting System are available from 1973. However, the data coverage is considered complete since 1995 for commitments at an activity level and 2002 for disbursements.  
  
  
  
Methodology  
  
  
  
Computation Method:  
  
  
  
The sum of ODA and OOF flows from all donors to developing countries in the agriculture sector.  
  
  
  
Disaggregation:  
  
  
  
This indicator can be disaggregated by type of flow (ODA or OOF), by donor, recipient country, type of finance, type of aid (project agriculture sub-sector) etc.  
  
  
  
Treatment of missing values:  
  
  
  
At country level  
  
  
  
Due to high quality of reporting, no estimates are produced for missing data.  
  
  
  
At regional and global levels  
  
  
  
Not applicable  
  
  
  
Regional aggregates:  
  
  
  
Global and regional figures are based on the sum of ODA and OOF flows to the agriculture sector.  
  
  
  
Sources of discrepancies:  
  
  
  
DAC statistics are standardized on a calendar year basis for all donors and may differ from fiscal year data available in budget documents for some countries.  
  
  
  
Data Sources  
  
  
  
Description:  
  
  
  
The OECD/DAC has been collecting data on official and private resource flows from 1960 at an aggregate level and 1973 at an activity level through the Creditor Reporting System (CRS data are considered complete from 1995 for commitments at an activity level and 2002 for disbursements).   
  
  
  
The data are reported by donors according to the same standards and methodologies (see here: http://www.oecd.org/dac/stats/methodology.htm).   
  
  
  
Data are reported on an annual calendar year basis by statistical reporters in national administrations (aid agencies, Ministries of Foreign Affairs or Finance, etc.  
  
  
  
Collection process:  
  
  
  
A statistical reporter is responsible for the collection of DAC statistics in each providing country/agency. This reporter is usually located in the national aid agency, Ministry of Foreign Affairs or Finance etc.  
  
  
  
Data Availability  
  
  
  
Description:  
  
  
  
On a recipient basis for all developing countries eligible for ODA.  
  
  
  
Time series:  
  
  
  
Data available since 1973 on an annual (calendar) basis  
  
  
  
Calendar  
  
  
  
Data collection:  
  
  
  
Data are published on an annual basis in December for flows in the previous year.  
  
  
  
Detailed 2015 flows will be published in December 2016.  
  
  
  
Data release:  
  
  
  
December 2016.   
  
  
  
Data providers  
  
  
  
Data are reported on an annual calendar year basis by statistical reporters in national administrations (aid agencies, Ministries of Foreign Affairs or Finance, etc.  
  
  
  
Data compilers  
  
  
  
OECD  
  
  
  
References  
  
  
  
URL:  
  
  
  
www.oecd.org/dac/stats  
  
  
  
References:  
  
  
  
See all links here: http://www.oecd.org/dac/stats/methodology.htm  
  
  
  
Related indicators as of February 2020  
  
  
  
Other ODA indicators:

Last updated: 16 October 2018  
  
  
  
  
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture  
  
Target 2.3: By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment  
  
Indicator 2.3.2: Average income of small-scale food producers, by sex and indigenous status  
  
  
  
Institutional information  
  
  
  
Organization(s):  
  
Food and Agriculture Organization (FAO)  
  
  
  
Concepts and definitions  
  
  
  
Definition:  
  
SDG indicator 2.3.2 measures income from on-farm production activities, which is related to the production of food and agricultural products. This includes income from crop production, livestock production, fisheries and aquaculture production, and from forestry production.   
  
The indicator is computed as annual income.   
  
  
  
FAO proposes to define small-scale food producers as producers who:   
  
operate an amount of land falling in the first two quintiles (the bottom 40 percent) of the cumulative distribution of land size at national level (measured in hectares); and   
  
operate a number of livestock falling in the first two quintiles (the bottom 40 percent) of the cumulative distribution of the number of livestock per production unit at national level (measured in Tropical Livestock Units – TLUs); and   
  
obtain an annual economic revenue from agricultural activities falling in the first two quintiles (the bottom 40 percent) of the cumulative distribution of economic revenues from agricultural activities per production unit at national level (measured in Purchasing Power Parity Dollars) not exceeding 34,387 Purchasing Power Parity Dollars.  
  
  
  
Rationale:  
  
The 2030 Sustainable Development Agenda has emphasized the importance of enhancing income of small-scale food producers, as these producers play an important role in the global production of food. The indicator monitors progress in this area, where the target is to double income by year 2030.   
  
The enhancement of income of small-scale production units also has implications on poverty reduction, as small-scale food producers are often poor, and are frequently found to be close to subsistence conditions.  
  
  
  
Concepts:  
  
The following concepts are adopted for the computation of indicators 2.3.2:  
  
Small-scale food producers are defined as those falling in the intersection of the bottom 40 percent of the cumulative distribution of land, livestock and revenues.  
  
Tropical Livestock Units are a conversion scale used for standardization and measurement of the number of livestock heads. One TLU is the metabolic weight equivalent of one cattle in North America. The complete list of conversion factors can be found in the Guidelines for the preparation of livestock sector Reviews   
  
The computation of income is based on the resolution adopted by the 17th International Conference of Labour Statisticians (ICLS). Income should be computed by deducting from revenues the operating costs and the depreciation of assets.  
  
  
  
Comments and limitations:  
  
  
  
Methodology  
  
  
  
Computation Method:  
  
Given i agricultural activities, including crops, livestock, fisheries and forestry activities, and j [1,…,n] small scale food producers defined as in the first section as a subset of all N [1,…,k] food producers, the SDG indicator 2.3.2 must be computed using the following formula:   
  
  
  
  
  
where:  
  
   
  
 is the physical volume of agricultural product i sold by the small-scale food producer j during year t;   
  
 is the constant sale price received by the small-scale food producer j for the agricultural product i during year t;   
  
 is the production cost of agricultural product i supported by the small-scale food producer j during year t;   
  
is the number of small-scale food producer.   
  
  
  
In details, physical volumes are derived, for each k producer, from the following items:  
  
Crop revenues: crop sold, crop for own consumption, crop used as feed, crop saved for seed, crop stored, crop used for by-products, crop given as gift, crop used for paying labour, crop used for paying rent, crop used for paying inputs, crop given out in sharecropping agreement (sharecrop out), crop wasted. Similar criteria apply for the computation of revenues from tree crops and forestry products.   
  
Livestock revenues: livestock sold (alive), livestock gifts given away (component can only be kept if stock variation is possible to construct), livestock by-/products sold, livestock products self-consumed, livestock by-products self-used (also a cost in crop, for example dung used as fertilisers), livestock by-/products pay away, livestock by-/products credit away.   
  
Forestry revenues: products sold, forestry products for own consumption, forestry products stored, forestry products used for paying labour, forestry products used for paying rent, forestry products used for paying inputs, forestry products given out in sharecropping agreement, Forestry products wasted.  
  
Fisheries revenues: captured fresh fish sold, captured processed fish sold, captured fresh fish for own consumption, captured processed fish for own consumption, traded fresh fish sold, traded processed fish sold.  
  
  
  
Production costs are meant to include operating costs. These comprise all variable costs (payments in cash and kind of agricultural inputs as fertiliser, seeds, and occasional labour) and fixed costs (hired labour, land rent and technical assistance costs).   
  
  
  
In more details, costs generally include the following items:   
  
Costs of crop activities: inputs paid in cash, land rent, technical assistance/extension costs, crop saved for seed, crop used for paying labour, crop used for paying rent, crop used for paying inputs, crop given out in sharecropping agreement (sharecrop out), crop wasted, crop used for producing by-products, total value of input purchased, including those reimbursed in kind   
  
Costs of livestock activities: livestock bought, livestock additional expenditures, crop used as feed, technical assistance/extension costs for livestock,   
  
Costs of forestry activities: input costs (seedlings, fertilisers, hired labour, etc.), machine rental costs, land rental costs, other related costs.   
  
Costs of fisheries and aquaculture activities: fishing gear expenditures, hired labour expenditures, trading activities, fresh fish purchases, processed fish purchases, other related costs   
  
  
  
To obtain comparable results across countries in the case of income, values must necessarily be expressed in International Dollars at Purchasing Power Parity (PPP $), based on the conversion provided by the World Bank International Comparison Project.   
  
  
  
Disaggregation:  
  
Indicator 2.3.2 must be disaggregated by classes of farming/pastoral/forestry enterprise size. The overall SDG Target 2.3 requires specific focus on women, indigenous peoples, family farmers, pastoralists and fishers. For this reason, the indicator must be disaggregated by sex, type of enterprise and by community of reference.  
  
  
  
Treatment of missing values:  
  
At country level  
  
To be determined.  
  
  
  
At regional and global levels  
  
To be determined.  
  
  
  
Regional aggregates:  
  
Not yet applicable.  
  
  
  
Sources of discrepancies:  
  
Not yet applicable.  
  
  
  
Methods and guidance available to countries for the compilation of the data at the national level:  
  
Information is currently not available.  
  
  
  
Quality assurance  
  
Information is currently not available.  
  
  
  
  
  
Data Sources  
  
  
  
Sources and data collection:  
  
Given that indicator 2.3.2 is measured on a target population of producers – those considered as small-scale – the ideal data source for measuring them is a single survey that collects all the information required with reference to individual production units. The most appropriate data source for collecting information on agricultural production and the associated costs are agricultural surveys. Other possibilities to be explored in absence of an agricultural surveys are:   
  
household surveys integrated with an agricultural module,   
  
agricultural censuses,   
  
administrative data.  
  
  
  
Data Availability  
  
  
  
Data is still not available in a systematic and harmonized fashion. The following data availability information is provided based on available suitable surveys in selected countries.   
  
  
  
Breakdown of the number of countries covered by region is as follows:  
  
  
  
Number of countries  
  
Nature of data  
  
World  
  
36  
  
E  
  
Africa  
  
15  
  
E  
  
Northern Africa  
  
  
  
  
  
Sub-Saharan Africa  
  
  
  
  
  
Eastern Africa  
  
5  
  
E  
  
Middle Africa  
  
1  
  
E  
  
Southern Africa  
  
1  
  
E  
  
Western Africa  
  
8  
  
E  
  
Americas  
  
7  
  
E  
  
Latin America and the Caribbean  
  
  
  
  
  
Caribbean  
  
  
  
  
  
Latin America  
  
3  
  
E  
  
Northern America  
  
4  
  
E  
  
Asia  
  
9  
  
E  
  
Central Asia  
  
1  
  
E  
  
Eastern Asia  
  
1  
  
E  
  
Southern Asia  
  
4  
  
E  
  
South-Eastern Asia  
  
2  
  
E  
  
Western Asia  
  
1  
  
E  
  
Europe  
  
5  
  
E  
  
Eastern Europe  
  
5  
  
E  
  
Northern Europe  
  
  
  
  
  
Southern Europe  
  
  
  
  
  
Western Europe  
  
  
  
  
  
Oceania  
  
  
  
  
  
Australia and New Zealand  
  
  
  
  
  
Melanesia  
  
  
  
  
  
Micronesia  
  
  
  
  
  
Polynesia  
  
  
  
  
  
  
  
Time series:  
  
By 2030.  
  
  
  
Calendar  
  
  
  
Data collection:  
  
 To be determined.  
  
   
  
Data release:  
  
To be determined.  
  
  
  
Data providers  
  
 National Statistical Offices  
  
  
  
Data compilers  
  
Food and Agricultural Organization of the United Nations  
  
  
  
References  
  
Note on “Proposed Methodology for Computing and Monitoring the sustainable Development Goal Indicator 2.3.1 and 2.3.2”, Office of the Chief Statistician and Statistics Division, FAO, Rome   
  
  
  
Defining Small Scale Food producers to Monitor Target 2.3 of the 2030 Agenda for Sustainable Development. FAO Statistics Division Working Paper available at http://www.fao.org/3/a-i6858e.pdf   
  
  
  
Related indicators as of February 2020  
  
Not applicable.

Last updated: 02 December 2016  
  
  
  
Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture  
  
Target 2.2: by 2030 end all forms of malnutrition, including achieving by 2025 the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons  
  
Indicator 2.2.1: Prevalence of stunting (height for age <-2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age  
  
  
  
Institutional information  
  
  
  
Organization(s):  
  
  
  
United Nations Children's Fund (UNICEF)  
  
World Health Organization (WHO)  
  
World Bank (WB)  
  
  
  
Concepts and definitions  
  
  
  
Definition:  
  
Prevalence of stunting (height-for-age <-2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age.   
  
 (French: pourcentage de sous-alimentation; Spanish: porcentaje de sub-alimentación)  
  
  
  
Rationale:  
  
Child growth is an internationally accepted outcome reflecting child nutritional status. Child stunting refers to a child who is too short for his or her age and is the result of chronic or recurrent malnutrition. Stunting is a contributing risk factor to child mortality and is also a marker of inequalities in human development. Stunted children fail to reach their physical and cognitive potential. Child stunting is one of the World Health Assembly nutrition target indicators.  
  
  
  
Concepts:  
  
NA.  
  
  
  
Comments and limitations:  
  
Survey estimates come with levels of uncertainty due to both sampling error and non-sampling error (e.g. mesasurement technical error, recording error etc.,). None of the two sources of errros have been fully taken into account for deriving estimates neither at country nor at regional and global levels.   
  
  
  
Methodology  
  
  
  
Computation Method:  
  
Survey estimates are based on standardized methodology using the WHO Child Growth Standards as described elsewhere (Ref: Anthro software manual). Global and regional estimates are based on methodology outlined in UNICEF-WHO-The World Bank: Joint child malnutrition estimates - Levels and trends (UNICEF/WHO/WB 2012 )  
  
  
  
Disaggregation:  
  
Global and regional estimates refer to the age group of children under 5 years, sexes combined. Disaggregated country data are available in a majority of household surveys and UNICEF - WHO- The World Bank Group are expanding the joint data set to include sub national and stratified estimates (e.g. sex, age groups, wealth, mothers' education, residence) in 2017.  
  
  
  
Treatment of missing values:  
  
  
  
At country level  
  
No imputation methodology is applied to derive estimates for countries or years where no data is avaialble.  
  
  
  
At regional and global levels  
  
Countries and years are treated as missing randomly following a multilevel modeling approach (International Journal of Epidemiology 2004;33:1260-70).  
  
  
  
Regional aggregates:  
  
Regional aggregates are available for the following classifications: UN, MDG, UNICEF, WHO, The World Bank regions and income groups.  
  
  
  
Sources of discrepancies:  
  
The standard analysis approach to construct the joint data set aims for a maximum comparability of country estimates. For the inclusion of survey estimates into the JME dataset, the inter-agency group applies survey quality assessment criteria. When there is insufficient documentation, the survey is not included until information becomes available. When raw data are available, and there is a question about the analysis approach, data re-analysis is performed following the standard methodology. Discrepancies between results from standardised approach and those reported may occur for various reasons, for example, the use of different standards for z-score calculations, imputation of the day of birth when missing, the use of rounded age in months, the use of different flagging systems for data exclusion. For surveys based on the previous NCHS/WHO references, and for which raw data are not available, a method for converting the z-scores to be based on the WHO Child Growth Standards is applied (Yang and de Onis, 2008). In addition, when surveys do not cover the age interval 0-<5 years, or are only representative of the rural areas, an adjustment based on other surveys for the same country, is performed. Any adjustment or conversion is transparently stated in the annotated joint data set.  
  
  
  
Data Sources  
  
  
  
Description:  
  
For the majority of countries, nationally representative household surveys constitute the data source. For a limited number of countries data from surveillance systems is used if sufficient population coverage is documented (about 80%). For both data sources, the child’s height and weight measurements have to be collected following recommended standard measuring techniques (WHO 2008).   
  
  
  
  
  
  
  
Collection process:  
  
UNICEF, WHO and the World Bank group jointly review new data sources to update the country level estimates. Each agency uses their existing mechanisms for obtaining data.  
  
For WHO, see published database methodology (de Onis et al. 2004). For UNICEF, the cadre of dedicated data and monitoring specialists working at national, regional and international levels in 190 countries routinely provide technical support for the collection and analysis of data. For the past 20 years UNICEF has undertaken an annual process to update its global databases, called Country Reporting on Indicators for Goals (CRING). This exercise is done in close collaboration with UNICEF country offices with the purpose of ensuring that UNICEF global databases contain updated and internationally comparable data. UNICEF country offices are invited to submit, through an online system, nationally representative data for over 100 key indicators on the well-being of women and children, including stunting. The country office staff work with local counterparts to ensure the most relevant data are shared. Updates sent by the country offices are then reviewed by sector specialists at UNICEF headquarters to check for consistency and overall data quality of the submitted estimates and re-analysis where possible. This review is based on a set of objective criteria to ensure that only the most reliable information is included in the databases. Once reviewed, feedback is made available on whether or not specific data points are accepted, and if not, the reasons why. UNICEF uses these data obtained through CRING to feed into the joint dataset. The World Bank Group provides estimates availabe through the Living Standard Measurement Surveys (LSMS) which ussually requires re-analysis of datasets given theat the LSMS reports often do not tabulate the stunting data.   
  
  
  
Data Availability  
  
  
  
Description:  
  
More than 150 countries.  
  
  
  
Time series:  
  
At country level, data are provided for the years where surveys are included in the joint dataset. Survey years range from 1983 to 2016. For the global and regional levels, estimates for the years 1990 to the latest available estimate upon release each year (i.e. in Sept 2016 edition of the Joint Malnutrition Estimates the latest available estimate was for 2015).   
  
  
  
Calendar  
  
  
  
Data collection:  
  
 Data sources are currently being updated to feed into the 2017 production of global and regional estimates and updated country level dataset to be released in May 2017.   
  
   
  
Data release:  
  
The next planned release fo global/regional estimates as well as the updated country dataset is May 2017. Global and regional estimates are released annually every May starting in 2017. The country level dataset is updated and released more often than the global/regional estimates. Although a set schedule has not yet been established, there have been at least two annual updates (one coinciding with the annual release of the regional/global estimates and at least one other update at another time of the year).  
  
  
  
  
  
Data providers  
  
Data providers vary and most commonly are ministries of health, national offices of statistics or national institutes of nutrition.   
  
  
  
  
  
Data compilers  
  
UNICEF, WHO and the World Bank group  
  
  
  
  
  
References  
  
Please provide links to all references for this indicator.  
  
  
  
URL:  
  
data.unicef.org/nutrition/malnutrition.html; http://www.who.int/nutgrowthdb/estimates2014/en/; http://datatopics.worldbank.org/child-malnutrition;  
  
  
  
References:  
  
United Nations Children’s Fund, World Health Organization, The World Bank (2012). UNICEFWHO-World Bank Joint Child Malnutrition Estimates. (UNICEF, New York; WHO, Geneva; The World Bank, Washington, DC; 2012).   
  
de Onis M, Blössner M, Borghi E, et al. (2004), Methodology for estimating regional and global trends of childhood malnutrition. Int J Epidemiol, 33(6):1260-70.  
  
Yang H and de Onis M. Algorithms for converting estimates of child malnutrition based on the NCHS reference into estimates based on the WHO Child Growth Standards   
BMC Pediatrics 2008, 8:19 (05 May 2008)   
(http://www.biomedcentral.com/1471-2431/8/19).  
  
World Health Organization (2008). Training Course on Child Growth Assessment. Geneva, WHO, 2008.  
  
International Journal of Epidemiology 2004;33:1260-70  
  
International Journal of Epidemiology 2003;32:518-26  
  
http://www.biomedcentral.com/1471-2431/8/19  
  
  
  
Related indicators as of February 2020

Last updated: 02 December 2016  
  
  
  
Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture  
  
Target 2.2: by 2030 end all forms of malnutrition, including achieving by 2025 the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons  
  
Indicator 2.2.2: Prevalence of malnutrition (weight for height >+2 or <-2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)  
  
  
  
Institutional information  
  
  
  
Organization(s):  
  
  
  
United Nations Children's Fund (UNICEF)  
  
World Health Organization (WHO)  
  
World Bank (WB)  
  
  
  
Concepts and definitions  
  
  
  
Definition:  
  
Prevalence of wasting (weight for height <-2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age.  
  
  
  
Rationale:  
  
Child growth is an internationally accepted outcome reflecting child nutritional status. Child wasting refers to a child who is too thin for his or her height and is the result of recent rapid weight loss or the failure to gain weight. A child who is moderately or severely wasted has an increased risk of death, but treatment is possible. Child wasting is one of the World Health Assembly nutrition target indicators.  
  
  
  
Concepts:  
  
The official MDG indicator is wasting as assessed using weight for height. Wasting can however also be assessed with mid upper arm circumference (MUAC). Estimates of wasting based on MUAC are not considered for the joint dataset. In addition, while wasting constitutes the major form of moderate acute malnutrition (MAM), there are acutely malnourished children who would not be picked up with weight-for-height or MUAC, namely those presenting bilateral pitting odema (characterized by swollen feet, face and limbs). For Surveys that report oedema cases, in the joint data set these are included in the prevalence of low weight-for-height.   
  
  
  
Comments and limitations:  
  
Survey estimates come with levels of uncertainty due to both sampling error and non-sampling error (e.g. mesasurement technical error, recording error etc.,). None of the two sources of errros have been fully taken into account for deriving estimates neither at country nor at regional and global levels. Surveys are carried out in a specific period of the year, usually over a few months. However, this indicator can be affected by seasonality, factors related to food availability (e.g. pre-harvest periods), disease (e.g. rainy season and diarrhoea, malaria, etc.), and natural disasters and conflicts. Hence, country-year estimates may not necessarily be comparable over time. Consequently, only latest estimates are provided.   
  
Methodology  
  
  
  
Computation Method:  
  
Survey estimates are based on standardized methodology using the WHO Child Growth Standards as described elsewhere (Ref: Anthro software manual). Global and regional estimates are based on methodology outlined in UNICEF-WHO-The World Bank: Joint child malnutrition estimates - Levels and trends (UNICEF/WHO/WB 2012 )  
  
  
  
Disaggregation:  
  
Global and regional estimates refer to the age group of children under 5 years, sexes combined. Disaggregated country data are available in a majority of household surveys and UNICEF - WHO- The World Bank Group are expanding the joint data set to include sub national and stratified estimates (e.g. sex, age groups, wealth, mothers' education, residence) in 2017.  
  
  
  
Treatment of missing values:  
  
  
  
At country level  
  
No imputation methodology is applied to derive estimates for countries or years where no data is avaialble.  
  
  
  
At regional and global levels  
  
Countries and years are treated as missing randomly following a multilevel modeling approach (International Journal of Epidemiology 2004;33:1260-70).  
  
  
  
Regional aggregates:  
  
Regional aggregates are available for the following classifications: UN, MDG, UNICEF, WHO, The World Bank regions and income groups.  
  
  
  
Sources of discrepancies:  
  
The standard analysis approach to construct the joint data set aims for a maximum comparability of country estimates. For the inclusion of survey estimates into the JME dataset, the inter-agency group applies survey quality assessment criteria. When there is insufficient documentation, the survey is not included until information becomes available. When raw data are available, and there is a question about the analysis approach, data re-analysis is performed following the standard methodology. Discrepancies between results from standardised approach and those reported may occur for various reasons, for example, the use of different standards for z-score calculations, imputation of the day of birth when missing, the use of rounded age in months, the use of different flagging systems for data exclusion. For surveys based on the previous NCHS/WHO references, and for which raw data are not available, a method for converting the z-scores to be based on the WHO Child Growth Standards is applied (Yang and de Onis, 2008). In addition, when surveys do not cover the age interval 0-<5 years, or are only representative of the rural areas, an adjustment based on other surveys for the same country, is performed. Any adjustment or conversion is transparently stated in the annotated joint data set.  
  
  
  
  
Data Sources  
  
  
  
Description:  
  
For the majority of countries, nationally representative household surveys constitute the data source. For a limited number of countries data from surveillance systems is used if sufficient population coverage is documented (about 80%). For both data sources, the child’s height and weight measurements have to be collected following recommended standard measuring techniques (WHO 2008).   
  
  
  
Collection process:  
  
UNICEF, WHO and the World Bank group jointly review new data sources to update the country level estimates. Each agency uses their existing mechanisms for obtaining data.  
  
For WHO, see published database methodology (de Onis et al. 2004). For UNICEF, the cadre of dedicated data and monitoring specialists working at national, regional and international levels in 190 countries routinely provide technical support for the collection and analysis of data. For the past 20 years UNICEF has undertaken an annual process to update its global databases, called Country Reporting on Indicators for Goals (CRING). This exercise is done in close collaboration with UNICEF country offices with the purpose of ensuring that UNICEF global databases contain updated and internationally comparable data. UNICEF country offices are invited to submit, through an online system, nationally representative data for over 100 key indicators on the well-being of women and children, including stunting. The country office staff work with local counterparts to ensure the most relevant data are shared. Updates sent by the country offices are then reviewed by sector specialists at UNICEF headquarters to check for consistency and overall data quality of the submitted estimates and re-analysis where possible. This review is based on a set of objective criteria to ensure that only the most reliable information is included in the databases. Once reviewed, feedback is made available on whether or not specific data points are accepted, and if not, the reasons why. UNICEF uses these data obtained through CRING to feed into the joint dataset. The World Bank Group provides estimates availabe through the Living Standard Measurement Surveys (LSMS) which ussually requires re-analysis of datasets given theat the LSMS reports often do not tabulate the stunting data.   
  
  
  
  
  
Data Availability  
  
  
  
Description:  
  
More than 150 countries.  
  
  
  
Time series:  
  
At country level, data are provided for the years where surveys are included in the joint dataset. Survey years range from 1983 to 2016. For the global and regional levels, estimates are provided only for the latest available estimate upon release each year (i.e. in Sept 2016 edition of the Joint Malnutrition Estimates the only estimate available for was for 2015 and no time series were provided).   
  
  
  
  
Calendar  
  
  
  
Data collection:  
  
 Data sources are currently being updated to feed into the 2017 production of global and regional estimates and updated country level dataset to be released in May 2017.   
  
   
  
   
  
Data release:  
  
The next planned release fo global/regional estimates as well as the updated country dataset is May 2017. Global and regional estimates are released annually every May starting in 2017. The country level dataset is updated and released more often than the global/regional estimates. Although a set schedule has not yet been established, there have been at least two annual updates (one coinciding with the annual release of the regional/global estimates and at least one other update at another time of the year).  
  
  
  
  
  
Data providers  
  
Data providers vary and most commonly are ministries of health, national offices of statistics or national institutes of nutrition.   
  
  
  
  
  
Data compilers  
  
UNICEF, WHO and the World Bank group  
  
  
  
  
  
References  
  
Please provide links to all references for this indicator.  
  
  
  
URL:  
  
data.unicef.org/nutrition/malnutrition.html; http://www.who.int/nutgrowthdb/estimates2014/en/; http://datatopics.worldbank.org/child-malnutrition;  
  
  
  
References:  
  
United Nations Children’s Fund, World Health Organization, The World Bank (2012). UNICEFWHO-World Bank Joint Child Malnutrition Estimates. (UNICEF, New York; WHO, Geneva; The World Bank, Washington, DC; 2012).   
  
de Onis M, Blössner M, Borghi E, et al. (2004), Methodology for estimating regional and global trends of childhood malnutrition. Int J Epidemiol, 33(6):1260-70.  
  
Yang H and de Onis M. Algorithms for converting estimates of child malnutrition based on the NCHS reference into estimates based on the WHO Child Growth Standards   
BMC Pediatrics 2008, 8:19 (05 May 2008)   
(http://www.biomedcentral.com/1471-2431/8/19).  
  
World Health Organization (2008). Training Course on Child Growth Assessment. Geneva, WHO, 2008.  
  
International Journal of Epidemiology 2004;33:1260-70  
  
International Journal of Epidemiology 2003;32:518-26  
  
http://www.biomedcentral.com/1471-2431/8/19  
  
  
  
  
  
Related indicators as of February 2020

Last updated: March 2020  
  
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture   
  
Target 2.5: By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed   
  
Indicator 2.5.2: Proportion of local breeds classified as being at risk of extinction  
  
Institutional information   
  
Organization(s):   
  
Food and Agriculture Organization of the United Nations (FAO)   
  
  
  
Concepts and definitions   
  
Definition:   
  
The indicator presents the percentage of local livestock breeds among local breeds with known risk status classified as being at risk of extinctions at a certain moment in time, as well as the trends for this percentage.   
  
Rationale:   
  
The indicator has a direct link to “biodiversity” as animal or livestock genetic resources represent an integral part of agricultural ecosystems and biodiversity as such. Further there are indirect links to “malnutrition”: Animal genetic resources for food and agriculture are an essential part of the biological basis for world food security, and contribute to the livelihoods of over a thousand million people. A diverse resource base is critical for human survival and well-being, and a contribution to the eradication of hunger: animal genetic resources are crucial in adapting to changing socio-economic and environmental conditions, including climate change. They are the animal breeder’s raw material and amongst the farmer’s most essential inputs. They are essential for sustainable agricultural production.   
  
No increase of the percentage of breeds being at risk or being extinct is directly related to “halt the loss of biodiversity”.   
  
Concepts:   
  
A similar indicator was originally proposed for the Target 15.5, and it serves also as an indicator for the Aichi Target 13 “Genetic Diversity of Terrestrial Domesticated Animals” under the Convention on Biological Diversity (CBD). It is described on the webpage of the Biodiversity Indicators Partnership (BIP), a network of organizations, which have come together to provide the most up-to date biodiversity information possible for tracking progress towards the Aichi Targets (http://www.bipindicators.net/domesticatedanimals). Further, it is presented in the Global Biodiversity Outlook 4, page 91 (see http://www.cbd.int/gbo/gbo4/publication/gbo4-en-lr.pdf) which is an output of the processes under the CBD.   
  
Comments and limitations:   
  
Breed-related information remains far from complete. Across the world, when excluding extinct breeds, 65 percent of local breeds are classified as of unknown status because of missing population data or lack of recent updates.   
  
Generally, data collection should be possible in all countries. Updating of population size data at least each 10 years is needed for the definition of the risk classes.   
  
Methodology   
  
Computation Method:   
  
The indicator is based on the data contained in FAO’s Global Databank for Animal Genetic Resources DAD-IS (http://dad.fao.org/). Risk classes are defined based on population sizes of breeds reported to DAD-IS. The risk class is considered to be “unknown” if (i) no population sizes are reported or (ii) the most recent population size reported refers to a year more than 10- years before the year of calculation (10 year cut off point).   
  
 Species are assigned to two groups. The first group comprises species that have high reproductive capacity, such as pigs, rabbits, guinea pigs and avian species, and the second comprises species that  
  
have low reproductive capacity, i.e. those belonging to the taxonomical families Bovidae,  
  
Equidae, Camelidae and Cervidae.  
  
  
  
The risk status categories are defined as follows (see also FAO. 2013. In vivo conservation of animal genetic resources. FAO Animal Production and Health Guidelines. No. 14. Rome. Accessible at http://www.fao.org/docrep/018/i3327e/i3327e.pdf.):   
  
Extinct. A breed is categorized as extinct when there are no breeding males or breeding  
  
females remaining and any cryoconserved genetic material that may be available is insufficient  
  
for breed reconstitution.  
  
Cryoconserved only. Breeds that have no living male or female animals remaining, but  
  
for which there is sufficient cryopreserved material to allow for reconstitution of the breed,  
  
are assigned to the category cryoconserved only. The ability to reconstitute an otherwise extinct  
  
breed depends on the amount of and type of stored germplasm. Requirements  
  
differ greatly according to species. Guidance on what constitutes “sufficient cryopreserved  
  
material” is provided in the FAO guidelines Cryoconservation of animal genetic resources  
  
(FAO, 2012).  
  
Critical. A breed is categorized as critical if:  
  
• the total number of breeding females is less than or equal to 100 (300 for species  
  
with low reproductive capacity); or  
  
• the overall population size is less than or equal to 80 (240) and the population trend  
  
is increasing and the proportion of females being bred to males of the same breed  
  
is greater than 80 percent (i.e. cross-breeding is equal to or less than 20 percent); or  
  
• the overall population size is less than or equal to 120 (360) and the population trend  
  
is stable or decreasing; or  
  
• the total number of breeding males is less than or equal to five (i.e. ΔF is 3 percent  
  
or greater).  
  
If the population trend is unknown, then it is assumed to be stable.  
  
Breeds for which demographic characteristics suggest a critical risk of extinction, but  
  
that have active conservation programmes (including cryoconservation) in place, or populations  
  
that are maintained by commercial companies or research institutions are considered  
  
to be “critical-maintained” for reporting purposes.  
  
Endangered. A breed is categorized as endangered if:  
  
• the total number of breeding females is greater than 100 (300 for species with low  
  
reproductive capacity) and less than or equal to 1 000 (3 000); or  
  
• the overall population size is greater than 80 (240) and less than 800 (2 400) and  
  
increasing in size and the percentage of females being bred to males of the same  
  
breed is above 80 percent; or  
  
• the overall population size is greater than 120 (360) and less than or equal to 1 200  
  
(3 600) and the trend is stable or decreasing; or  
  
• the total number of breeding males is less than or equal to 20 and greater than five  
  
(i.e. ΔF is between 1 and 3 percent).  
  
Once again, if the population trend is unknown, then it is assumed to be stable.  
  
Endangered breeds will be assigned to the subcategory “endangered-maintained” if  
  
active conservation programmes are in place or if their populations are maintained by commercial  
  
companies or research institutions.  
  
Vulnerable. A breed is categorized as vulnerable if:  
  
• the total number of breeding females is between 1 000 and 2 000 (3 000 and 6 000  
  
for species with low reproductive capacity); or  
  
• the overall population size is greater than 800 (2 400) and less than or equal to 1 600  
  
(4 800) and increasing and the percentage of females being bred to males of the  
  
same breed is greater than 80 percent; or  
  
• the overall population size is greater than 1 200 (3 600) and less than or equal to  
  
2 400 (7 200) but stable or decreasing; or  
  
• the total number of breeding males is between 20 and 35 (i.e. the ΔF is between 0.5  
  
and 1 percent).  
  
Unreported population trends are assumed to be stable.  
  
Not at risk. A breed is categorized as not at risk if the population status is known and  
  
the breed does not fall in the critical or endangered categories (including the respective  
  
subcategories) or the vulnerable category.   
  
Unknown. This category is self-explanatory and calls for action. A population survey is  
  
needed; the breed could be critical, endangered or vulnerable.  
  
  
  
A Breed is considered to be at risk if it has been classified as either critical, critical-maintained, endangered, endangered-maintained or vulnerable.   
  
  
  
The indicator is calculated as follows:  
  
  
  
Risk status of local breeds  
  
Number  
  
At risk  
  
  
  
Not at risk  
  
  
  
Unknown  
  
  
  
All risk classes  
  
  
  
  
  
SDG indicator for country i:   
  
  
  
  
  
  
  
Disaggregation:   
  
Data are available by country.   
  
Treatment of missing values:  
  
At breed level  
  
If no population data are provided for a respective year, it is assumed that the risk status remains the same as for the last year for which population data have been reported. In this case the nature of data is considered to be estimated. However, if the most recent reporting refers to a year more than 10- years before, the risk status is considered “unknown”.   
  
  
  
At country level  
  
Country information is considered to be missing if 100% percent of a country’s local breeds do have risk status “unknown”. If 100% of a country’s breed risk status values are estimates (see above), the nature of country data is also considered to be an estimate.  
  
  
  
Regional aggregates:  
  
Aggregated SDG indicator Pj for k countries (with at least one local breed with known risk status) in region j with total number of local breeds in k countries:   
  
=  
  
Regional and global results are only reported if more than 50% of the countries within the respective region or globally are not missing  
  
  
  
Sources of discrepancies:  
  
NA  
  
  
  
Methods and guidance available to countries for the compilation of the data at the national level:   
  
Livestock census on breed level or data derived from national herdbooks or national surveys.   
  
FAO. 2011. Surveying and monitoring of animal genetic resources. FAO Animal Production and Health Guidelines. No. 7. Rome. (available at http://www.fao.org/docrep/014/ba0055e/ba0055e00.htm)   
  
Quality assurance   
  
Described in section 7 of FAO. 2011. Surveying and monitoring of animal genetic resources. FAO Animal Production and Health Guidelines. No. 7. Rome. (available at http://www.fao.org/docrep/014/ba0055e/ba0055e00.htm)   
  
The guidelines were presented to and endorsed by the Commission on Genetic Resources for Food and   
  
Agriculture at its Thirteenth Regular Session in July 2011.   
  
Data Sources   
  
Description:   
  
DAD-IS is the Domestic Animal Diversity Information System maintained and developed by FAO (http://www.fao.org/dad-is/en/). It provides access to searchable databases of breed-related information and photos and links to other online resources on livestock diversity. It allows to analyze the diversity of livestock breeds on national, regional and global levels including the status of breeds regarding their risk of extinction. DAD-IS currently contains data from 182 countries and 38 species. It contains information on more than 8,800 mammalian and avian breeds, among those about 7,700 are considered local (i.e. reported to occur in only one country).  
  
Collection process:  
  
At country level:  
  
Livestock census on breed level or data derived from national herdbooks or national surveys.   
  
  
  
Data Availability   
  
Data are public available through DAD-IS (see http://dad.fao.org/).  
  
Calendar   
  
Data collection:  
  
 Data entry into DAD-IS is possible all over the year.  
  
   
  
Data release:  
  
The indicator is updated in the first quarter of each year.  
  
Data providers   
  
Description:   
  
The data are provided by the National Coordinators for the Management of Animal Genetic Resources (NCs). The NC is officially nominated by the country (usually by the Ministry of Agriculture). FAO provides the password for entering/updating the country’s data within the global data information system DAD-IS directly to the NC, after having received the official nomination letter.   
  
Data compilers   
  
FAO   
  
References   
  
URL:   
  
http://dad.fao.org/   
  
References:   
  
FAO. 2013. In vivo conservation of animal genetic resources.  
  
FAO Animal Production and Health Guidelines. No. 14. Rome. Accessible at http://www.fao.org/docrep/018/i3327e/i3327e.pdf

Last updated: March 2020  
  
  
  
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture  
  
Target 2.1: By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round  
  
Indicator 2.1.2: Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)  
  
  
  
Institutional information  
  
  
  
Organization(s):  
  
Food and Agriculture Organisation of the United Nations (FAO)  
  
  
  
  
  
Concepts and definitions  
  
  
  
Definition:  
  
The indicator measures the percentage of individuals in the population who have experienced food insecurity at moderate or severe levels during the reference period. The severity of food insecurity, defined as a latent trait, is measured on the Food Insecurity Experience Scale global reference scale, a measurement standard established by FAO through the application of the Food Insecurity Experience Scale in more than 140 countries worldwide, starting in 2014.  
  
  
  
Rationale:  
  
Food insecurity at moderate levels of severity is typically associated with the inability to regularly eat healthy, balanced diets. As such, high prevalence of food insecurity at moderate levels can be considered a predictor of various forms of diet-related health conditions in the population, associated with micronutrient deficiency and unbalanced diets. Severe levels of food insecurity, on the other hand, imply a high probability of reduced food intake and therefore can lead to more severe forms of undernutrition, including hunger.  
  
  
  
Short questionnaires like the FIES are very easy to administer at limited cost, which is one of the main advantages of their use. The ability to precisely determine the food insecurity status of specific individuals or households, however, is limited by the small number of questions, a reason why assignment of individual respondents to food insecurity classes is best done in probability terms, thus ensuring that estimates of prevalence rates in a population are sufficiently reliable even when based on relatively small sample sizes.   
  
  
  
As with any statistical assessment, reliability and precision crucially depend on the quality of the survey design and implementation. One major advantage of the analytic treatment of the data through the Rasch model based methods is that it permits testing the quality of the data collected and evaluating the likely margin of uncertainty around estimated prevalence rates, which should always be reported.  
  
  
  
Concepts:  
  
Extensive research over more than 25 years has demonstrated that the inability to access food results in a series of experiences and conditions that are fairly common across cultures and socio-economic contexts and that range from being concerned about the ability to obtain enough food, to the need to compromise on the quality or the diversity of food consumed, to being forced to reduce the intake of food by cutting portion sizes or skipping meals, up to the extreme condition of feeling hungry and not having means to access any food for a whole day. Typical conditions like these form the basis of an experience-based food insecurity measurement scale. When analysed through sound statistical methods rooted in Item Response Theory, data collected through such scales provide the basis to compute theoretically consistent, cross country comparable measures of the prevalence of food insecurity. The severity of the food insecurity condition as measured by this indicator thus directly reflects the extent of households’ or individuals’ inability to regularly access the food they need.  
  
  
  
Comments and limitations:  
  
An average of less than three minutes of survey time is estimated to collect FIES data in a well-conducted face-to-face survey, which should make it possible to include the FIES-SM in a nationally representative survey in every country in the world, at a very reasonable cost. FAO provides versions of the FIES-SM adapted and translated in each of the more than 200 languages and dialects used in the Gallup World Poll.  
  
  
  
When used in the Gallup World Poll, with sample sizes of only about 1000 individuals, the width of confidence intervals rarely exceeds 20% of the measured prevalence (that is, prevalence rates of around 50% are estimated with margins of errors of plus or minus 5%). Obviously, confidence intervals are likely to be much smaller when national prevalence rates are estimated using larger samples.  
  
  
  
Compared to other proposed non-official indicators of household food insecurity, the FIES based approach has the advantage that food insecurity prevalence rates are directly comparable across population groups and countries. Even if they use similar labels (such as “mild”, “moderate” and “severe” food insecurity) other approaches have yet to demonstrate the formal comparability of the thresholds used for classification, due to lack of the definition of a proper statistical model that links the values of the “indexes” or “scores” used for classification, to the severity of food insecurity. For this reason, care should be taken when comparing the results obtained with the FIES with those obtained with these other indicators, even if, unfortunately, similar labels are used to describe them.  
  
  
  
Methodology  
  
  
  
Computation Method:  
  
Data at the individual or household level is collected by applying an experience-based food security scale questionnaire within a survey. The food security survey module collects answers to questions asking respondents to report the occurrence of several typical experiences and conditions associated with food insecurity. The data is analysed using the Rasch model (also known as one-parameter logistic model, 1-PL), which postulates that the probability of observing an affirmative answer by respondent i to question j, is a logistic function of the distance, on an underlying scale of severity, between the position of the respondent, , and that of the item, .  
  
  
  
Parameters and can be estimated using maximum likelihood procedures. Parameters , in particular, are interpreted as a measure of the severity of the food security condition for each respondent and are used to classify them into classes of food insecurity.  
  
  
  
The FIES considers the three classes of (a) food security or mild food insecurity; b) moderate or severe food insecurity, and (c) severe food insecurity, and estimates the probability of being moderately or severely food insecure () and the probability of being severely food insecure () for each respondent, with . The probability of being food secure or mildly food insecure can be obtained as .  
  
  
  
Given a representative sample, the prevalence of food insecurity at moderate or severe levels (FImod+sev), and at severe levels (FIsev) in the population are computed as the weighted sum of the probability of belonging to the moderate or severe food insecurity class, and to the severe food insecurity class, respectively, of all individual or household respondents in a sample:  
  
  
  
  
  
and   
  
  
  
where are post-stratification weights that indicate the proportion of individual or households in the national population represented by each element in the sample.  
  
It is important to note that if are individual sampling weights, then the prevalence of food insecurity refers to the total population of individuals, while if they are household weights, the prevalence refers to the population of households. For the calculation of the indicator 2.1.2, objective is to produce a prevalence of individuals. This implies that:  
  
if a survey is at household level, and provides household sampling weights, they should be transformed to individual sampling weights by multiplying the weights by the household size. This individual weighting system can then be used to calculate the individual prevalence rates in formulas (1) and (2)  
  
If the survey includes only adults, then the adult weights applied to the probabilities in formulas (1) and (2) provide the adult prevalence rates (). In this case, to calculate the prevalence in the total population, then the proportion of children who live in households where at least one adult is food insecure must also be calculated. This can be done by dividing the adult weights by the number of adults in the household and multiplying those approximate household weights by the number of children in the household. Once the approximate child weights are obtained, the prevalence of food insecurity of children who live in households where at least one adult is food insecure () can be calculated by applying these weights to the probabilities of food insecurity in formulas (1) and (2). The prevalence of food insecurity in the total population is finally calculated as:  
  
  
  
and   
  
  
  
Where and are the adult and children populations in the country.  
  
  
  
When applied to the country total population, the prevalence of food insecurity in the total population provides the number of individuals who live in food insecure households (or in households where at least one adult is food insecure) in a country, at different levels of severity ( and ). In the database, the number of food insecure people are expressed in thousands.   
  
Disaggregation:  
  
As the FIES or any other compatible experience-based food security questionnaire is applied through surveys, the prevalence of food insecurity can be measured in any population group for which the survey used to collect data is representative.  
  
  
  
If applied at household level, disaggregation is thus possible based on household characteristics such as location, household income, composition (including for example presence and number of small children, members with disabilities, elderly members, etc.), sex, age and education of the household head, etc. If applied at the individual level, proper disaggregation of the prevalence of food insecurity by sex is possible as the prevalence of food insecurity among male and among female members of the same population group can be measured independently.  
  
  
  
When producing disaggregated statistics, attention must be devoted to verifying the validity of the application by estimating the Rasch model with the data from each specific subpopulation group and, if necessary, perform the appropriate equating of the measure before comparing results.  
  
It is good practice to associate a measure of variability (margins of error or upper and lower bound) when disaggregated data are produced.  
  
  
  
Treatment of missing values:  
  
  
  
At country level  
  
The indicator is not computed if no country data are available.  
  
  
  
At regional and global levels  
  
Missing values for individual countries are implicitly imputed to be equal to the population weighted average of the estimated values of the countries present in the same region.  
  
  
  
Regional aggregates:  
  
  
  
Regional and global aggregates of FImod+sev and FIsev are computed as:  
  
  
  
Where a = {mod+sev, sev} and is the values of FIa estimated for country c in the region and Nc is the corresponding population size.  
  
  
  
Sources of discrepancies:  
  
  
  
In the few cases where indicators of food insecurity based on experience-based food security scales have been reported by countries (U.S., Canada, Mexico, Guatemala and Brazil), these have been based on nationally set thresholds that do not correspond to the international thresholds proposed by the FIES. See Annex I and Table A3 in http://www.fao.org/3/i4830e.pdf for a description of the differences. In the future, it is desirable that country would start reporting prevalence estimates using also the internationally set thresholds for moderate or severe and severe levels, in addition to those based on national thresholds.  
  
  
  
FAO is ready to provide assistance on the analytic methods needed to estimate prevalence based on the FIES global reference thresholds.  
  
  
  
Methods and guidance available to countries for the compilation of the data at the national level:  
  
  
  
Experience-based food security scales data are collected through population surveys (either household or individual surveys) using questionnaires/modules that are adapted to the country language and condition.  
  
  
  
Examples are provided below:   
  
U.S.A.: Household Food Security Survey Module (https://www.ers.usda.gov/media/8271/hh2012.pdf )  
  
Brazil: Escala Brasileira de Insegurança Alimentar (http://biblioteca.ibge.gov.br/visualizacao/livros/liv91984.pdf , Quadro 5, page 30)  
  
Mexico: Escala Mexicana de Seguridad Alimentaria (http://www.beta.inegi.org.mx/contenidos/proyectos/enchogares/regulares/enigh/tradicional/2012/doc/c\_tra\_enigh12\_hogares.pdf, pages 13-14)  
  
Guatemala: Escala Latino Americana y Caribena de Seguridad Alimentaria (http://www.ine.gob.gt/sistema/uploads/2015/12/11/DDrIEuLOPuEcXTcLXab1yOkiOV2HQreq.pdf , pagina 3)  
  
FAO – Food Insecurity Experience Scale (http://www.fao.org/3/a-bl404e.pdf )   
  
  
  
Inclusion of the FIES survey module in a questionnaire is a simple matter of adapting the questions to the local language by following guidelines provided in the following documents.  
  
http://www.fao.org/3/a-be898e.pdf   
  
http://www.fao.org/3/a-be898f.pdf   
  
http://www.fao.org/3/a-be898s.pdf  
  
http://www.fao.org/3/a-be898r.pdf  
  
http://www.fao.org/3/a-be898a.pdf  
  
http://www.fao.org/3/a-be898c.pdf  
  
  
  
  
  
Quality assurance  
  
FIES data are validated through testing of adherence to the Rasch model assumption of equal discrimination of the items and absence of residual correlation and measurement of Rasch reliability indexes. Such test would reveal whether the data is of sufficient quality to produce reliable estimates of the prevalence of food insecurity according to the FIES standard.   
  
Then, item severity parameters are compared with the FIES global reference standard to verify the possibility of calibrating the measures against such standard and thus produce estimates of the prevalence of food insecurity that can be considered comparable across countries.  
  
Relevant material is available here http://www.fao.org/3/a-i4830e.pdf, http://www.fao.org/3/b-i4830s.pdf, http://www.fao.org/3/c-i4830f.pdf and here http://www.fao.org/3/a-i3946e.pdf.  
  
  
  
National data used to compile the indicator is obtained directly from the microdata dissemination websites of countries, when available (e.g. USA, Mexico), or by direct request to the national statistical offices responsible for data collection (e.g. Brazil, Canada, Guatemala).  
  
  
  
For data collected by FAO through the Gallup World Poll, the results of the analysis of the 2014, 2015 and 2016 round of data collection have been shared with all national statistical offices in the world in May 2017 through an email communication sent by the FAO Chief Statistician, requesting feedback. By October 2017, positive feedback was received by 57 countries.  
  
  
  
Data Sources  
  
  
  
Description of sources and collection process:  
  
Data can be collected using the Food Insecurity Experience Scale survey module (FIES-SM) developed by FAO, or any other experience-based food security scale questionnaires, including:  
  
the Household Food Security Survey Module (HFSSM) developed by the Economic Research Service of the US Department of Agriculture, and used in the US and Canada,   
  
the Latin American and Caribbean Food Security Scale (or Escala Latinoamericana y Caribeña de Seguridad Alimentaria – ELCSA), used in Guatemala and tested in several other Spanish speaking countries in Latin America,   
  
the Mexican Food Security Scale (or Escala Mexicana de Seguridad Alimentaria, - EMSA), an adaptation of the ELCSA used in Mexico,   
  
the Brazilian Food Insecurity Scale (Escala Brasileira de medida de la Insegurança Alimentar – EBIA) used in Brazil, or   
  
the Household Food Insecurity Access Scale (HFIAS),   
  
or any adaptation of the above that can be calibrated against the global FIES.  
  
  
  
Two versions of the FIES-SM are available for use in surveys of individuals or households respectively, and the difference stands in whether respondents are asked to report only on their individual experiences, or also on that of other member of the household.  
  
The current FIES-SM module include eight questions as in the table below.   
  
  
  
GLOBAL FOOD INSECURITY EXPERIENCE SCALE  
  
Now I would like to ask you some questions about food.   
  
Q1. During the last 12 MONTHS, was there a time when you (or any other adult in the household) were worried you would not have enough food to eat because of a lack of money or other resources?  
  
0 No  
  
1 Yes  
  
98 Don’t Know  
  
99 Refused  
  
Q2. Still thinking about the last 12 MONTHS, was there a time when you (or any other adult in the household) were unable to eat healthy and nutritious food because of a lack of money or other resources?   
  
0 No  
  
1 Yes  
  
98 Don’t Know  
  
99 Refused  
  
Q3. And was there a time when you (or any other adult in the household) ate only a few kinds of foods because of a lack of money or other resources?   
  
0 No  
  
1 Yes  
  
98 Don’t Know  
  
99 Refused  
  
Q4. Was there a time when you (or any other adult in the household) had to skip a meal because there was not enough money or other resources to get food?  
  
0 No  
  
1 Yes  
  
98 Don’t Know  
  
99 Refused  
  
Q5. Still thinking about the last 12 MONTHS, was there a time when you (or any other adult in the household) ate less than you thought you should because of a lack of money or other resources?  
  
0 No  
  
1 Yes  
  
98 Don’t Know  
  
99 Refused  
  
Q6. And was there a time when your household ran out of food because of a lack of money or other resources?  
  
0 No  
  
1 Yes  
  
98 Don’t Know  
  
99 Refused  
  
Q7. Was there a time when you (or any other adult in the household) were hungry but did not eat because there was not enough money or other resources for food?  
  
0 No  
  
1 Yes  
  
98 Don’t Know  
  
99 Refused  
  
Q8. Finally, was there a time when you (or any other adult in the household) went without eating for a whole day because of a lack of money or other resources?  
  
0 No  
  
1 Yes  
  
98 Don’t Know  
  
99 Refused  
  
  
  
The questions should be adapted and administered in the respondents’ preferred language and enumerators instructed to make sure that respondents recognize the reference period and the qualifier according to which experiences should be reported only when due to “lack of money or other resources” and not, for example, for reasons related to health or other cultural habits (such as fasting for religious credos).  
  
  
  
The FIES-SM can be included in virtually any telephone-based or personal interview based survey of the population, though face to face interview is preferred.   
  
  
  
Since 2014, the individual referenced FIES-SM is applied to nationally representative samples of the population aged 15 or more in all countries covered by the Gallup World Poll (more than 140 countries every year, covering 90% of the world population). In most countries samples include about 1000 individuals (with larger samples of 3000 individuals in India and 5000 in mainland China).  
  
  
  
Other national surveys exist that already collect FIES compatible data.   
  
  
  
In Burkina Faso, the FIES was included in the 2014 round of ENQUETE MULTISECTORIELLE CONTINUE (EMC-BF).  
  
  
  
In Cabo Verde, the FIES was included in the 2018 round of INQUÉRITO NACIONAL DE VULNERABILIDADE ALIMENTAR E NUTRICIONAL DAS FAMÍLIAS.  
  
  
  
In Canada, Canadian Health Food Security Scale was included by Statistics Canada in the 2015 round of Canadian Community Health Survey (CCHS).  
  
  
  
In Chile, FIES was included in the 2017 round of Encuesta de Caracterización Socioeconómica Nacional (Casen).  
  
  
  
In Ecuador, FIES was included in the 2016 round of the GESTIÓN DE ESTADÍSTICAS PERMANENTES A HOGARES (GEPH-ENEMDU).  
  
  
  
In Ghana, the FIES was included in the 2016-17 round of Living Standards Survey.  
  
  
  
In Indonesia, FIES is regularly collected every year since 2017 through National Socio-Economic Survey (SUSENAS).  
  
  
  
In Israel, HFSSM was collected in the 2016 round of the Food Security Survey.  
  
  
  
In Kenya, the FIES was included in the 2015-16 round of Integrated Household Budget.  
  
  
  
In Malawi, the FIES was included in the 2016-17 round of FOURTH INTEGRATED HOUSEHOLD SURVEY.  
  
  
  
In Nigeria, the FIES was included in the 2015 round of GENERAL HOUSEHOLD SURVEY-PANEL.  
  
  
  
In Palestine, FIES was included in the 2018 round of the Socio-economic Monitoring of the Palestinian Households’ Survey.  
  
  
  
In the Republic of Korea, the Korean translation of the HFSSM was included in the 2014 and 2015 rounds of the Korea National Health and Nutrition Examination Survey (KNHANES).  
  
  
  
In the Russian Federation, FIES was collected in the 2018 round of Nutrition sample survey.  
  
  
  
In Saint Lucia, FIES data were collected in the Survey of Living Conditions and Household Budgets 2016.  
  
  
  
In Seychelles, FIES data were collected in the Quarterly Labour Force Survey.  
  
  
  
In the United States, the HFSSM is included every year in the Current Population Survey Food Security Supplement (CPS-FSS) by the US Bureau of Census since 1995. (The CPS-FSS reached about 83,000 individuals aged 15 or more in about 42,000 households in 2014.)  
  
  
  
Obtaining internationally comparable data for global monitoring:  
  
  
  
To ensure comparability of the FImod+sev and FIsev indicators computed for different populations, universal thresholds are defined on the FIES global reference scale and converted into corresponding values on the “local” scales obtained as a result of application of the Rasch model on any specific population, through a process of “equating”.  
  
  
  
Equating is a form of standardization of the metric based on identification of the subset of items that can be considered common to the global FIES and the specific scale used for measurement in each context. The severity levels associated with the common items are used as anchoring points to adjust the global FIES thresholds to the local scales. The standardization process ensures that the mean and standard deviation of the set of common items is the same when measured on the global FIES or on the national scale. Compatibility with the global FIES and the possibility to compile this indicator requires that at least four of the eight FIES items are identified as common.  
  
  
  
The Statistics Division at FAO has developed the RM.weights package under R, which provides routines for estimating the parameters of the Rasch model using conditional maximum likelihood, with the possibility to allow for the complex survey design.  
  
  
  
  
  
Data Availability  
  
  
  
Description:  
  
Data for 2014, 2015,2016, 2017 and 2018 are available from FAO for 137 countries, areas and territories included in the Gallup World Poll. Regional and sub regional aggregates are computed for all regions, with the exceptions of the Caribbean and the Oceania regions (as most small island states in the Caribbean and in the South Pacific are not covered by the GWP) and Middle Africa (as less than 50% of the regional population was covered). Data have been subject to a country consultation process and only results validated by national statistical offices are published at country level.   
  
  
  
FIES compatible data from official national surveys are already available from theBurkina Faso, Cabo Verde, Canada, Chile, Ecuador, Ghana, Indonesia, Israel, Kenya, Malawi, Nigeria, Palestine, Republic of Korea (2014 and 2015), Russian Federation (2016-18), Saint Lucia, Seychelles, United States of America. .   
  
  
  
Breakdown of the number of countries covered by region is as follows:  
  
World  
  
137  
  
Africa  
  
39  
  
Northern Africa  
  
5  
  
Sub-Saharan Africa  
  
34  
  
Eastern Africa  
  
11  
  
Middle Africa  
  
4  
  
Southern Africa  
  
5  
  
Western Africa  
  
14  
  
Americas  
  
22  
  
Latin America and the Caribbean  
  
20  
  
Caribbean  
  
3  
  
Latin America  
  
17  
  
Northern America  
  
2  
  
Asia  
  
36  
  
Central Asia  
  
4  
  
Eastern Asia  
  
4  
  
Southern Asia  
  
8  
  
South-Eastern Asia  
  
7  
  
Western Asia  
  
13  
  
Europe  
  
39  
  
Eastern Europe  
  
10  
  
Northern Europe  
  
10  
  
Southern Europe  
  
12  
  
Western Europe  
  
7  
  
Oceania  
  
2  
  
Australia and New Zealand  
  
2  
  
Melanesia  
  
0  
  
Micronesia  
  
0  
  
Polynesia  
  
0  
  
  
  
Time series:  
  
Only the 3-year average (2014-2016, 2015-17 and 2016-18) is provided.  
  
  
  
Calendar  
  
  
  
Data collection:  
  
 Continuing  
  
   
  
Data release:  
  
March 2020  
  
  
  
Data providers  
  
National data providers will be the National Statistical Authorities that are responsible for the survey in which the FIES or similar scale is included. FAO will provide data for countries where the FIES or compatible module is not included in any national survey.  
  
  
  
Data compilers  
  
Organization(s) responsible for compilation and reporting on this indicator at the global level: Food and Agriculture Organization of the United Nations, Statistics Division, Food Security and Nutrition Statistics Team.  
  
  
  
References  
  
  
  
URL: http://www.fao.org/in-action/Voices-of-the-Hungry/   
  
http://www.fao.org/3/i4830e.pdf  
  
Related indicators as of February 2020  
  
NA.

Last updated: March 2020  
  
  
  
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture  
  
Target 2.a: Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries  
  
Indicator 2.a.1: The agriculture orientation index for government expenditures  
  
  
  
Institutional information  
  
  
  
Organization(s):  
  
  
  
Food and Agriculture Organization of the United Nations (FAO)  
  
  
  
  
  
Concepts and definitions  
  
  
  
Definition:  
  
  
  
The Agriculture Orientation Index (AOI) for Government Expenditures is defined as the Agriculture share of Government Expenditure, divided by the Agriculture value added share of GDP, where Agriculture refers to the agriculture, forestry, fishing and hunting sector. The measure is a currency-free index, calculated as the ratio of these two shares. National governments are requested to compile Government Expenditures according to the Government Finance Statistics (GFS) and the Classification of the Functions of Government (COFOG), and Agriculture value added share of GDP according to the System of National Accounts (SNA).  
  
  
  
Rationale:  
  
  
  
An Agriculture Orientation Index (AOI) greater than 1 reflects a higher orientation towards the agriculture sector, which receives a higher share of government spending relative to its contribution to economic value-added. An AOI less than 1 reflects a lower orientation to agriculture, while an AOI equal to 1 reflects neutrality in a government’s orientation to the agriculture sector.  
  
  
  
Government spending in agriculture includes spending on sector policies and programs; soil improvement and soil degradation control; irrigation and reservoirs for agricultural use; animal health management, livestock research and training in animal husbandry; marine/freshwater biological research; afforestation and other forestry projects; etc.  
  
  
  
Spending in these agricultural activities helps to increase sector efficiency, productivity and income growth by increasing physical or human capital and /or reducing inter-temporal budget constraints.   
  
  
  
However, the private sector typically under-invests in these activities due to the presence of market failure (e.g. the public good nature of research and development; the positive externalities from improved soil and water conditions; lack of access to competitive credit due to asymmetric information between producers and financial institutions, etc.). Similarly, the high risk faced by agricultural producers, particular smallholders unable to hedge against risk, often requires government intervention in terms of income redistribution to support smallholders in distress following crop failures and livestock loss from pests, droughts, floods, infrastructure failure, or severe price changes.   
  
  
  
Government spending in agriculture is essential to address these market failures and the periodic need for income redistribution. This leads to several potential indicators for the SDGs, which include: a) the level of Government Expenditure on Agriculture (GEA); b) the Agriculture share of Government Expenditure, and c) the AOI for Government Expenditures.  
  
  
  
An indicator that measures GEA levels fails to take into account the size of an economy. If two countries, A and B, have the same level of GEA, and the same agriculture contribution to GDP, but country A’s economy is 10 times that of country B, setting the same target levels for GEA fails to take economic size into account.   
  
  
  
An indicator that measures the Agriculture share of Government Expenditure fails to take into account the relative contributions of the agricultural sector to a country’s GDP. Consider two countries with the same economic size, C and D, where agriculture contributes 2 per cent to C’s GDP, and 10 per cent to country D’s GDP. If total Government Expenditures were equal in both countries, C would experience greater relative investment in Agriculture than D. If total Government Expenditures differed, the result could be magnified or diluted.  
  
  
  
The AOI index takes into account a country’s economic size, Agriculture’s contribution to GDP, and the total amount of Government Expenditure. As such, it allows for the setting of a universal and achievable target. Nonetheless, it is useful to interpret the AOI in combination with its numerator and denominator separately: the Agriculture share of Government Expenditure and the Agriculture value-added Share of GDP  
  
  
  
Concepts:  
  
  
  
Agriculture refers to the agriculture, forestry, fishing and hunting sector, or Division A of ISIC Rev 4 (equal to Division A+B of ISIC Rev 3.2).   
  
Government Expenditure are all expense and acquisition of non-financial assets associated with supporting a particular sector, as defined in the Government Finance Statistics Manual (GFSM) 2014 developed by the International Monetary Fund (IMF).   
  
Government Expenditure are classified according to the Classification of the Functions of Government (COFOG), a classification developed by the Organisation for Economic Co-operation and Development (OECD) and published by the United Nations Statistical Division (UNSD).   
  
  
  
Agriculture value-added and GDP are based on the System of National Accounts (SNA).   
  
  
  
Comments and limitations:  
  
  
  
Since the numerator of this data is based on administrative sources, there is no confidence interval or standard error associated with government expenditure data. For the denominator, national accounts data typically do not provide any standard error or confidence interval information.  
  
  
  
The key limitation with this indicator is that it takes into account only central government expenditure. To the extent that some countries may have heavier intervention in agriculture by sub-national governments, this will not be taken into account.  
  
  
  
Methodology  
  
  
  
Computation Method:  
  
  
  
  
  
  
  
Where:   
  
  
  
  
  
  
  
  
  
  
Agriculture refers to COFOG category 042 (agriculture, forestry, fishing and hunting); and  
  
  
  
  
  
  
  
  
  
  
  
Agriculture refers to the Division A of ISIC Rev 4 (agriculture, forestry, fishing and hunting), equal to Division A+B of ISIC Rev 3.2.  
  
  
  
Disaggregation:  
  
  
  
Since this indicator is based on national accounts data and total central government expenditures, it does not allow for disaggregation by demographic characteristics or geographic location.  
  
  
  
Treatment of missing values:  
  
  
  
At country level  
  
  
  
The missing values of 2018 government expenditure in agriculture were imputed from the ones of 2017 data submitted from countries.   
  
  
  
At regional and global levels  
  
  
  
Regional and global aggregates of 2018 are based on mixed data of normal data from countries for which data are available and imputed data for countries for which data are not available. For the other period from 2001 to 2017, the regional and global aggregates are based on those of countries for which data are available. This may result in users interpreting these aggregates as pertaining to all countries in the region, which is the equivalent of treating countries with missing data as if they were the same as those for which data are available.  
  
  
  
Regional aggregates:  
  
  
  
Global and regional estimates are compiled by first separately summing across countries the four individual components of the index: government expenditure on agriculture, total government expenditure, agriculture value-added, and GDP. These are added only for those countries in a region (or globally) for which all components are available, and the index then calculated for this larger region.  
  
  
  
Sources of discrepancies:  
  
  
  
Since FAO does not alter government expenditure data reported by countries, and uses the national accounts estimates published by the UN Statistics Division (where some national data may be imputed), there should be no difference between data reported by FAO and national figures.  
  
  
  
  
  
Data Sources  
  
  
  
Description:  
  
  
  
Data on government expenditures is collected from countries using an annual questionnaire administered by FAO. Since countries typically compile government expenditure data based on their financial systems, and is administrative data covering the entirely of government expenditures, particularly at the central government level, there is no sampling issue and no possibility of sampling error. For some countries that do not report such data to FAO, data may be obtained from the IMF GFS database (which includes similar data but covering more sectors, and with less disaggregation of COFOG 042) or from official national governmental websites.   
  
  
  
Data on agriculture value-added and GDP are based on the system of national accounts, which is an analytical framework that compiles national data from a mix of survey, census and administrative (e.g. tax) sources. This data is obtained from the UN Statistics Division, which provides national accounts estimates for 220 countries and territories.  
  
  
  
Collection process:  
  
  
  
Data for the denominator are annually collected from countries using the FAO questionnaire on Government Expenditure on Agriculture (GEA), developed in collaboration with the IMF. Data from countries may be supplemented, for missing countries, with data collected by the IMF, or published on official national governmental websites. The official counterpart(s) at country level are, depending on the country, from the national statistics office, the ministry of finance (or other central planning agency), or the ministry of agriculture. Validation and consultation were conducted through various FAO commissions and committees, including its two agricultural statistics commissions in Africa and the Asia and Pacific, its Committee on Agriculture and Livestock Statistics in Latin America and the Caribbean, and its Committee on Agriculture.  
  
  
  
Data Availability  
  
  
  
Description:  
  
  
  
Data are available for about 100 countries on a regular basis.   
  
  
  
Time series:  
  
  
  
From 2001 to 2018  
  
  
  
Calendar  
  
  
  
Data collection:  
  
  
  
The 2019 data collection of Government Expenditure on Agriculture will start in May 2020.. Due to time required to collect, compile and publish national data, very few countries will be able to provide 2019 reference year data for the FAO Spring 2020 data collection cycle.  
  
  
  
Data release:  
  
  
  
As this data is largely compiled annually, the next release for this indicator is planned for November 2020, covering data up to reference year 2019 (for the countries for which data collection, compilation, release is more timely).  
  
  
  
Data providers  
  
  
  
Ministry of Finance, Central Planning Agency, National Statistics Office, and/or Ministry of Agriculture  
  
  
  
Data compilers  
  
  
  
Food and Agriculture Organization of the UN (FAO)  
  
  
  
References  
  
  
  
URL:  
  
  
  
www.fao.org  
  
  
  
References:  
  
  
  
FAOSTAT domain of Government Expenditure on Agriculture http://www.fao.org/faostat/en/#data/IG ;  
  
IMF Government Finance Statistics Manual 2014   
https://www.imf.org/external/np/sta/gfsm/.

Last updated: 14 April 2020  
  
  
  
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture.  
  
Target 2.2: By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons.  
  
Indicator 2.2.3: Prevalence of anaemia in women aged 15-49 years, by pregnancy status (percentage)  
  
  
  
Institutional information  
  
  
  
Organization(s):  
  
World Health Organization (WHO)  
  
  
  
Concepts and definitions  
  
  
  
Definition:  
  
Percentage of women aged 15−49 years with a haemoglobin concentration less than 120 g/L for non-pregnant women and lactating women, and less than 110 g/L for pregnant women, adjusted for altitude and smoking.  
  
  
  
Rationale:  
  
Anaemia is highly prevalent globally, disproportionately affecting children and women of reproductive age. It negatively affects cognitive and motor development and work capacity, and among pregnant women iron deficiency anaemia is associated with adverse reproductive outcomes, including preterm delivery, low-birth-weight infants, and decreased iron stores for the baby, which may lead to impaired development. Iron deficiency is considered the most common cause of anaemia, but there are other nutritional and non-nutritional causes. Blood haemoglobin concentrations are affected by many factors, including altitude (metres above sea level), smoking, trimester of pregnancy, age and sex. Anaemia can be assessed by measuring blood haemoglobin, and when used in combination with other indicators of iron status, blood haemoglobin provides information about the severity of iron deficiency. The anaemia prevalence for the population is used to classify the public health significance of the problem.  
  
  
  
Concepts:  
  
Anaemia: condition in which the concentration of blood haemoglobin falls below established cut-off values.  
  
Iron deficiency state in which there is insufficient iron to maintain the normal physiological function of blood, brain and muscles (ICD-11, 5B5K.0 iron deficiency)  
  
Iron deficiency anaemia: (ICD-11, 3A00, iron deficiency anaemia)  
  
Blood haemoglobin concentration: concentration of haemoglobin in whole blood  
  
  
  
Comments and limitations:  
  
Despite the extensive data search, data for blood haemoglobin concentrations are still limited, compared to other nutritional indicators such as child anthropometry (1, 24); this was especially true in the high-income countries of the WHO European Region. As a result, the estimates may not capture the full variation across countries and regions, tending to “shrink” towards global means when data are sparse. Additionally, it was not possible to incorporate into the analyses some potentially important predictors of blood haemoglobin concentration, especially dietary iron and iron supplementation, because of limited data.  
  
  
  
Methodology  
  
  
  
Computation Method:  
  
The anaemia status of women is assessed using blood haemoglobin concentrations. In surveys, blood haemoglobin concentrations are typically measured using the direct cyanmethemoglobin method in a laboratory or with a portable, battery-operated, haemoglobin photometer in the field that uses the azide-methaemoglobin method.  
  
Prevalence of anaemia and/or mean haemoglobin in women of reproductive age were obtained from 303 population-representative data sources from 116 countries worldwide. Data collected from 1990 to 2016 were used. Adjustment of data on blood haemoglobin concentrations for altitude and smoking was carried out whenever possible. Biologically implausible haemoglobin values (<25 g/L or >200 g/L) were excluded. A Bayesian hierarchical mixture model was used to estimate haemoglobin distributions and systematically addressed missing data, non-linear time trends, and representativeness of data sources. Full details on statistical methods may be found here: Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995–2011: a systematic analysis of population-representative data (Stevens et al, 2013). Briefly, the model calculates estimates for each country and year, informed by data from that country and year themselves, if available, and by data from other years in the same country and in other countries with data for similar time periods, especially countries in the same region. The model borrows data, to a greater extent, when data are non-existent or weakly informative, and to a lesser degree for data-rich countries and regions. The resulting estimates are also informed by covariates that help predict blood haemoglobin concentrations (e.g. maternal education, prevalence of sickle-cell disorders, mean weight-for-age z-score for children). The uncertainty ranges (credibility intervals) reflect the major sources of uncertainty, including sampling error, non-sampling error due to issues in sample design/measurement, and uncertainty from making estimates for countries and years without data.  
  
  
  
Disaggregation:  
  
Anaemia prevalence data are generally reported disaggregated by age, sex, income, geographic region (within country) and 1st administrative level within a country. When producing estimates of anaemia for the purpose of contributing to the monitoring of SDGs, estimates are produced for women of reproductive age (15-49 years) by pregnancy status (pregnant or non-nonpregnant) for each country. Data are then aggregated by WHO or UN region and for the global level.  
  
  
  
Treatment of missing values:  
  
  
  
At country level  
  
A Bayesian hierarchical mixture model was used to estimate haemoglobin distributions and systematically addressed missing data, non-linear time trends, and representativeness of data sources. The full description of the methodology for country and region estimates can be found at Supplement to: Stevens GA, Finucane MM, De-Regil LM, et al. Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995–2011: a systematic analysis of population-representative data. Lancet Glob Health 2013; 1: e16–25. Available at https://www.thelancet.com/cms/10.1016/S2214-109X(13)70001-9/attachment/e073f9da-1330-4a1d-a1a0-67caf08c11bf/mmc1.pdf.  
  
  
  
At regional and global levels  
  
Distributions for regions were calculated as population-weighted averages of the constituent countries (see treatment of missing values at country level).  
  
  
  
Regional aggregates:  
  
Distributions for regions were calculated as population-weighted averages of the constituent countries (see methodology for deriving country-level estimates above).  
  
  
  
Sources of discrepancies:  
  
Estimates were generated based on methodology that adjusted for the main sources of discrepancies.  
  
  
  
Methods and guidance available to countries for the compilation of the data at the national level:  
  
This indicator is part of the Global Nutrition Monitoring Framework (GNMF), for which operational guidance is offered to countries – the Global nutrition monitoring framework: Operational guidance for tracking progress in meeting targets for 2025 available at https://www.who.int/nutrition/publications/operational-guidance-GNMF-indicators in the six UN official languages.  
  
  
  
WHO is also collaborating with UNICEF, the US Centers for Disease Control and Prevention and Nutrition International to update a Micronutrient Survey Manual, containing details about conducting and national nutrition survey and reporting results.  
  
   
  
Quality assurance  
  
Survey data provided in peer-reviewed publications or survey reports are screened for inclusion in the WHO Micronutrients Database. Eligibility criteria include: details of the sampling method are provided; the sample was representative of at least the 1st administrative level (e.g. state, province, canton, oblast); the sample was population-based, household-based, or facility-based (i.e., for pregnant women, newborns, and preschool and school-age children); the sample was cross-sectional or was the baseline assessment in an intervention programme; and the study used standard, validated data collection techniques and laboratory methodology. If there are particular concerns regarding the reported data, attempts are made to discuss these concerns with a country representative.  
  
  
  
  
  
Data Sources  
  
  
  
Description:  
  
The preferable source of data is population-based surveys, followed by data from surveillance systems. In some cases, anonymized individual-level data are obtained from multi-country surveys, including demographic and health surveys, multiple indicator cluster surveys, reproductive health surveys and malaria indicator surveys. However, the Micronutrients Database of the WHO Vitamin and Mineral Information System (VMNIS) (https://www.who.int/vmnis/database/en/) compiles and summarizes data on the micronutrient status of populations from various other sources, including data collected from the scientific literature and through collaborators, including WHO regional and country offices, United Nations organizations, ministries of health, research and academic institutions, and nongovernmental organizations.  
  
  
  
Collection process:  
  
A PubMed search was carried out for relevant search terms related to anaemia, haemoglobin and iron status, searching for studies published after 1 January 1990. In addition to indexed articles, many reports of national and international agencies were identified and accessed through requests to each corresponding organization. Once survey data are compiled and the Bayesian hierarchical mixture model is run to generate anaemia estimates, countries are sent a memorandum to provide a background to the estimates and explain the process. Information on the survey data used to generate the estimates for that country, estimates for the year 2015, and the resulting plots for each country are provided along with an explanation of the methodology used in generating the estimates. Countries are requested to provide feedback within six weeks.  
  
  
  
Data Availability  
  
  
  
Description:  
  
Prevalence of anaemia and/or mean haemoglobin in women of reproductive age were obtained from 303 population-representative data sources from 116 countries worldwide. Data collected from 1990 to 2016 were used.  
  
Time series:  
  
Estimates for 2000 to 2016 were derived in the latest exercise.  
  
  
  
Calendar  
  
  
  
Data collection:  
  
Data on anaemia are continuously being collected from survey report and manuscripts and entered into the WHO Micronutrients Database.   
  
Data release:  
  
 There is no fixed date in which the new round of anaemia estimates will be generated; however, estimates are generally generated every three tofive years.   
  
  
  
Data providers  
  
There are two main data sources of survey data for anaemia: 1) reports generated by countries or implementing partners and 2) published manuscripts. Occasionally, Member States, regional offices, the international community or colleagues managing other databases within WHO provide reports directly to staff responsible for maintaining the WHO Micronutrients Database. If data meet the eligibility criteria, they are entered into the database. Reports and publications are primarily requested and collected from:   
  
 Ministries of Health through WHO regional and country offices,   
  
 National research and academic institutions,  
  
 Nongovernmental organizations, and  
  
 Organizations of the United Nations system.   
  
  
  
Data compilers  
  
WHO compiles the data fed into the Micronutrients Database of the WHO Vitamin and Mineral Information System (VMNIS).   
  
  
  
References  
  
  
  
URL:   
  
https://www.who.int/nutrition/global-target-2025  
  
http://apps.who.int/iris/bitstream/handle/10665/259904/9789241513609-eng.pdf;jsessionid=4F4165EBA8F217E2F555AE98E977981D?sequence=1  
  
https://www.who.int/nutrition/publications/globaltargets2025\_policybrief\_anaemia/en/  
  
  
  
References:   
  
WHO. Comprehensive Implementation Plan on Maternal, Infant and Young Child Nutrition. Geneva: World Health Organization; 2014  
  
Every Woman Every Child. Global strategy for women's, children's and adolescents' health. New York: United Nations; 2015  
  
WHO. Global Nutrition Targets 2025: Anaemia policy brief (WHO/NMH/NHD/14.4). Geneva: World Health Organization; 2014  
  
  
  
Related indicators  
  
Goal 1. No poverty  
  
The capacity for physical work is hampered when people are anaemic. Anaemia is estimated to contribute to 17% lower productivity in heavy manual labour and 5% lower productivity in other manual labour. A modelling exercise in India estimated that a birth cohort of individuals with iron-deficiency anaemia (IDA) in 2013 will lose more than US$ 24 million over their lifetimes as a result of productivity loss due to IDA.  
  
Additionally, the mental capacity that is undeveloped when children are iron deficient affects their academic performance and future earnings potential. Consequently, childhood anaemia is associated with a 2.5% drop in wages in adulthood, affecting both productivity and economic growth.  
  
Nutrient deficiencies that can contribute to anaemia include iron, riboflavin, folic acid, zinc, vitamin B12, and vitamin A. Currently, more than 80 countries have legislation to add one or more of these nutrients to wheat flour, maize flour, and/or rice. Adding these nutrients to commonly consumed grains is one step toward improving productivity and thereby reducing poverty.  
  
Goal 3. Good health and well-being  
  
Maternal and Newborn Health  
  
Anaemia during pregnancy increases the risk of maternal and perinatal mortality. Anaemia during pregnancy also contributes to low birth-weight infants, which the World Health Organization (WHO) defines as weighing less than less than 2500 grams or 5.5 pounds. Newborns that are born small are prone to death and diseases while they are young. If they survive, they are at an increased risk for poor mental development in childhood and chronic health problems such as diabetes and heart disease later in life.  
  
  
  
Non-Communicable Diseases  
  
Anaemia is a non-communicable disease. As noted above, nutritional anaemia is caused by vitamin and mineral deficiencies.  
  
Goal 4. Quality education  
  
Poor health in childhood can lead to reductions in educational achievement. While iron deficiency limits cognitive development, children who have adequate iron have more energy to participate in classroom exercises, and they are more mentally prepared to master the material.  
  
A large body of literature documents the positive impact of iron interventions on tests of cognitive and motor development. This review found, “the available evidence satisfies all of the conditions needed to conclude that iron deficiency causes cognitive deficits and developmental delays and that these can be at least partially reversed by iron therapy, though the effect may diminish among older children.”  
  
Goal 5. Gender equality  
  
Anaemia rates in females are much higher than males. While anaemia rates decrease for males by the end of puberty, they remain high for females through reproductive years due to menstruation.  
  
Therefore, reducing anaemia contributes to boosting females’ relative academic performance and worker productivity and helps achieve gender equality.  
  
For more details, see Food Fortification Initiative - Fortify to Address Sustainable Development Goals (http://www.ffinetwork.org/why\_fortify/SDGs.html).

**Hunger**



In politics, humanitarian aid, and social science, **hunger** is a condition in which a person, for a sustained period, is unable to eat sufficient food to meet basic [nutritional](https://en.wikipedia.org/wiki/Nutrition) needs. So in the field of hunger relief, the term *hunger* is used in a sense that goes beyond the common desire for food thatall humans experience.



Throughout history, portions of the world's population have often suffered sustained periods of hunger. In many cases, this resulted from food supply disruptions caused by war, plagues, or adverse weather. In the decades following [World War II,](https://en.wikipedia.org/wiki/World_War_II) technological progress and enhanced political cooperation suggested it might be possible to substantially reduce the number of people suffering from hunger. While progress was uneven, by 2015 the threat of extreme hunger subsided for many of the world's people. According to figures published by the [FAO](https://en.wikipedia.org/wiki/FAO) in 2019 however, the number of people suffering from chronic hunger has been increasing over the last four years. This is both as a percentage of the world's population, and in absolute terms, with about 821 million afflicted with hunger in 2018.



[Martin Luther King](https://en.wikipedia.org/wiki/Martin_Luther_King) (center), one of many 20th century political figures who considered it important to fight hunger: "When I die, don't build a monument to me. Don't bestow me degrees from great universities. Just clothe the naked. Say that I tried to house the homeless. Let people say that I tried to feed the hungry."



[[1]](#page10)

While most of the world's hungry people continue to live in Asia, much of the increase in hunger since 2015 occurred in Africa and South America. The FAO's 2017 report discussed three principal reasons for the recent

increase in hunger: climate, conflict, and economic slowdowns. The 2018 report focused on [extreme weather](https://en.wikipedia.org/wiki/Extreme_weather) as a primary driver of the increase in hunger, finding rises were especially severe in countries where the agricultural systems were most sensitive to extreme variations in weather. While the FAO's 2019 report found there was also a strong correlation between increases in hunger and countries that had suffered an [economic slowdown.](https://en.wikipedia.org/wiki/Economic_slowdown)



Many thousands of organisations are engaged in the field of hunger relief; operating at local, national, regional or international levels. Some of these organisations are dedicated to hunger relief, while others may work in a number of different fields. The organisations range from multilateral institutions, to national governments, to small local initiatives such as independent soup kitchens. Many participate in umbrella networks that connect together thousands of different hunger relief organisations. At the global level, much of the world's hunger relief efforts are coordinated by the UN, and geared towards achieving the 2030 Sustainable Development Goal for "*Zero hunger*".

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**Definition and related terms**



There is only one globally recognized approach for defining and measuring hunger that is generally used by those studying or working to relieve hunger as a social problem. This is the United Nation's [FAO](https://en.wikipedia.org/wiki/FAO) measurement, which they typically refer to as undernourishment, sometimes as hunger or 'food deprivation'. For the FAO:



**Hunger** or **undernourishment** exists when "caloric intake is below the minimum dietary energy requirement(MDER). The MDER is the amount of energy needed to perform light activity and to maintain a minimum



acceptable weight for attained height." [[2]](#page10) The FAO use different MDER thresholds for different countries, due to variations in climate and cultural factors. Typically a yearly "balance sheet" approach is used, with the minimum dietary energy requirement tallied against the estimated total calories consumed over the year. The FAO definitions differentate hunger from malnutrition and food insecurity:[[3][4][5]](#page10)

[**Malnutrition**](https://en.wikipedia.org/wiki/Malnutrition) resultsfrom "deficiencies, excesses or imbalances in the consumption of macro- and/or micro-nutrients." In the FAO definition, all hungry people suffer from malnutrition, but people who are malnourished may not be hungry. They may get sufficient raw calories to avoid hunger but lack essential micronutrients, or they may even consume an excess of raw calories and hence suffer from obesity.[[5][4][3]](#page10)



[**Food insecurity**](https://en.wikipedia.org/wiki/Food_insecurity) occurswhen people are at risk, or worried about, not being able to meet their preferences forfood, including in terms of raw calories and nutritional value. In the FAO definition, all hungry people are food insecure, but not all food-insecure people are hungry (though there is a very strong overlap between hunger and [*severe food insecurity*.). The FAO have reported that food insecurity quite often results in simultaneous stunted](https://en.wikipedia.org/wiki/Stunted_growth)[growth for children, and obesity for adults.](https://en.wikipedia.org/wiki/Stunted_growth)[[5][4][3]](#page10)

**

Not all of the organizations in the hunger relief field use the FAO definition of hunger. Some use a broader definition that overlaps more fully with malnutrition. The alternative definitions do however tend to go beyond the commonly understood meaning of hunger as a painful or uncomfortable motivational condition; the desire for food is something that all humans frequently experience, even the most affluent, and is not in itself a social problem.[[6][5][4][3]](#page10)

**As a physical condition**

**

The physical sensation of hunger is related to contractions of the stomach muscles. These contractions—sometimes called hunger pangs once they become severe—are believed to be triggered by high concentrations of the [ghrelin](https://en.wikipedia.org/wiki/Ghrelin) hormone. The hormones [Peptide YY](https://en.wikipedia.org/wiki/Peptide_YY) and [Leptin](https://en.wikipedia.org/wiki/Leptin) can have an opposite effect on the appetite, causing the sensation of being full. Ghrelin can be released if



[blood sugar levels](https://en.wikipedia.org/wiki/Blood_sugar_level) get low—a condition that can result from long periods without eating. Stomach contractions from hunger can



be especially severe and painful in children and young adults.

Hunger pangs can be made worse by irregular meals. People who cannot afford to eat more than once a day sometimes refuse one-off additional meals, because if they do not eat at around the same time on the next days, they may suffer extra severe hunger pangs.[[7]](#page11) Older people may feel less violent stomach contractions when they get hungry, but still suffer the secondary effects resulting from low food intake: these include weakness, irritability and decreased concentration. Prolonged lack of adequate nutrition also causes increased susceptibility to [disease](https://en.wikipedia.org/wiki/Disease) and reduced ability for the body to self [heal.](https://en.wikipedia.org/wiki/Healing)[[8][9]](#page11)



**World statistics**



The [United nations](https://en.wikipedia.org/wiki/United_nations) publish an annual report on the state of food security and nutrition across the world. Led by the [FAO,](https://en.wikipedia.org/wiki/FAO) the 2019 report was joint authored by four other UN agencies: the [WFP,](https://en.wikipedia.org/wiki/WFP) [IFAD,](https://en.wikipedia.org/wiki/IFAD) [WHO](https://en.wikipedia.org/wiki/WHO) and [UNICEF.](https://en.wikipedia.org/wiki/UNICEF) The FAO's yearly report provides a statistical overview on the prevalence of hunger around the world, and is widely considered the main global reference for tracking hunger. No simple set of statistics can ever fully capture the multi dimensional nature of hunger however. Reasons include that the FAO's key metric for hunger, "undernourishment", is defined solely in terms of dietary energy availability – disregarding micro-nutrients such as vitamins or minerals. Second, the FAO uses the energy requirements for minimum activity levels as a benchmark; many people would not count as hungry by the FAO's measure yet still be eating too little to undertake hard manual labour, which might be the only sort of work available to them. Thirdly, the FAO statistics do not always reflect short-term undernourishment.[[4][10]](#page11)



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **2005** | **2010** | **2015** | **2016** | **2017** | **2018** |  |
|  |  |  |  |  |  |  |  |
| **Number (million) of undernourished people** | 947.2 | 822.3 | 785.4 | 796.5 | 811.7 | 821.6 |  |
| **(global)**[[10]](#page11) |  |
|  |  |  |  |  |  |  |
| **Percentage of undernourished people (global)**[[10]](#page11) | 14.5% | 11.8% | 10.6% | 10.7% | 10.8% | 10.8% |  |

An alternative measure of hunger across the world is the [Global Hunger Index](https://en.wikipedia.org/wiki/Global_Hunger_Index) (GHI). Unlike the FAO's measure, the GHI defines hunger in a way that goes beyond raw calorie intake, to include for example ingestion of micronutrients. GDI is a multidimensional statistical tool used to describe the state of countries’ hunger situation. The GHI measures progress and failures in the global fight against hunger.[[11]](#page11) The GHI is updated once a year. The data from the 2015 report showed that Hunger levels have dropped 27% since 2000. Fifty two countries remain at serious or alarming levels. In addition to the latest statistics on Hunger and Food Security, the GHI also features different special topics each year. The 2015 report include an article on conflict and food security.[[12]](#page11)



**The fight against hunger**



**Pre world war II**

Throughout history, the need to aid those suffering from hunger has been commonly, though not universally,[[13]](#page11) recognized. The philosopher [Simone Weil](https://en.wikipedia.org/wiki/Simone_Weil) wrote that feeding the hungry when you have resources to do so is the most obvious of all human [obligations.](https://en.wikipedia.org/wiki/Moral_obligation) She says that as far back as [Ancient Egypt,](https://en.wikipedia.org/wiki/Ancient_Egypt) many believed that people had to show they had helped the hungry in order to justify themselves in the afterlife. Weil writes that [Social progress](https://en.wikipedia.org/wiki/Social_progress) is commonly held to be first of all, "...a transition to a state of human society in which people will not suffer from hunger." [[14]](#page11) Social historian [Karl Polanyi](https://en.wikipedia.org/wiki/Karl_Polanyi) wrote that before markets became the world's dominant form of economic organization in the 19th century, most human societies would either starve all together or not at all, because communities would invariably share their food.[[15]](#page11)



Unemployed men outside a soup kitchen in Chicago, 1931



While some of the principles for avoiding famines had been laid out in the very first book of the Holy Bible,[[16]](#page11) they were not always understood. Historical hunger relief efforts were often largely left to religious organisations and individual kindness. Even up to early modern times, political leaders often reacted to famine with bewilderment and confusion. From the first age of globalization, which began in the 19th century, it became more common for the elite to consider problems like hunger in global terms. However, as early globalization largely coincided with the high peak of influence for [classical liberalism,](https://en.wikipedia.org/wiki/Classical_liberalism) there was relatively little call for politicians to address world hunger.[[17][18]](#page11)



In the late nineteenth and early twentieth century, the view that politicians ought not to intervene against hunger was increasingly challenged by campaigning journalists. There were also more frequent calls for large scale intervention against world hunger from academics and politicians, such as U.S. President [Woodrow Wilson.](https://en.wikipedia.org/wiki/Woodrow_Wilson) Funded both by the government and private donations, the U.S. was able to dispatch millions of tons of food aid to European countries during and in the years immediately after WWI, organised by agencies such as the [American Relief Administration.](https://en.wikipedia.org/wiki/American_Relief_Administration) Hunger as an academic and social topic came to further [prominence in the U.S. thanks to mass media coverage of the issue as a domestic problem during the Great](https://en.wikipedia.org/wiki/Great_Depression)



[Depression.](https://en.wikipedia.org/wiki/Great_Depression)[[19][20][21][22][1][23]](#page11)



**Efforts after World War II**

While there had been increasing attention to hunger relief from the late 19th century, Dr David Grigg has summarised that prior to the end of World War II, world hunger still received relatively little academic or political attention; whereas after 1945 there was an explosion of interest in the topic.[[21]](#page11)

[After World War II, a new international politico-economic order came into being, which was later described as Embedded](https://en.wikipedia.org/wiki/Embedded_liberalism) [liberalism. For at least the first decade after the war, the United States, then by far the period's most dominant national actor, was](https://en.wikipedia.org/wiki/Embedded_liberalism) strongly supportive of efforts to tackle world hunger and to promote international development. It heavily funded the United Nation's development programmes, and later the efforts of other multilateral organizations like the [International Monetary Fund](https://en.wikipedia.org/wiki/International_Monetary_Fund) (IMF) and the [World Bank](https://en.wikipedia.org/wiki/World_Bank) (WB).[[21][1][24]](#page11)



The newly established United Nations became a leading player in co-ordinating the global fight against hunger. The UN has three agencies that work to promote food security and agricultural development: the Food and Agriculture Organization (FAO), the [World Food Programme](https://en.wikipedia.org/wiki/World_Food_Programme) (WFP) and the [International Fund for Agricultural Development](https://en.wikipedia.org/wiki/International_Fund_for_Agricultural_Development) (IFAD). FAO is the world's agricultural knowledge agency, providing policy and technical assistance to developing countries to promote food security, nutrition and sustainable agricultural production, particularly in rural areas. WFP's key mission is to deliver food into the hands of the hungry poor. The agency steps in during [emergencies](https://en.wikipedia.org/wiki/Emergencies) and uses food to aid recovery after emergencies. Its longer term approaches to hunger helps the transition from recovery to development. IFAD, with its knowledge of rural poverty and exclusive focus on poor rural people, designs and implements programmes to help those people access the assets, services and opportunities they need to overcome poverty.[[21][1][24]](#page11)



Following successful post WWII reconstruction of Germany and Japan, the IMF and WB began to turn their attention to the developing world. A great many [civil society actors](https://en.wikipedia.org/wiki/NGO) were also active in trying to combat hunger, especially after the late 1970s when global media began to bring the plight of starving people in places like [Ethiopia](https://en.wikipedia.org/wiki/Ethiopia) to wider attention. Most significant of all, especially in the late 1960s and 70s, the [Green revolution](https://en.wikipedia.org/wiki/Green_revolution) helped improved agricultural technology propagate throughout the



[world.[21][1][24]](#page11)

The United States began to change its approach to the problem of world hunger from about the mid 1950s. Influential members of the administration became less enthusiastic about methods they saw as promoting an over reliance on the state, as they feared that might assist the spread of communism. By the 1980s, the previous consensus in favour of moderate government intervention had been [displaced across the western world.](https://en.wikipedia.org/wiki/Post-war_displacement_of_Keynesianism) The IMF and World Bank in particular began to promote market-based solutions. In cases where countries became dependent on the IMF, they sometimes forced national governments to prioritize debt repayments and sharply cut public services. This sometimes had a negative effect on efforts to combat hunger.[[25][26][27]](#page12)

Organizations such as [Food First](https://en.wikipedia.org/wiki/Food_First) raised the issue of [food sovereignty](https://en.wikipedia.org/wiki/Food_sovereignty) and claimed that every country on earth (with the possible minor exceptions of some city-states) has sufficient agricultural capacity to feed its own people, but that the ["free trade"](https://en.wikipedia.org/wiki/Free_trade) economic order, which from the late 1970s to about 2008 had been associated with such institutions as the IMF and World Bank, had prevented this from happening. The World Bank itself claimed it was part of the solution to hunger, asserting that the best way for countries to break the cycle of poverty and hunger was to build export-led economies that provide the financial means to buy foodstuffs on the world market. However, in the early 21st century the World Bank and IMF became less dogmatic about promoting [free market](https://en.wikipedia.org/wiki/Free_market) reforms. They increasingly returned to the view that government intervention



does have a role to play, and that it can be advisable for governments to support food security with policies favourable to domestic agriculture, even for countries that do not have a [Comparative advantage](https://en.wikipedia.org/wiki/Comparative_advantage) in that area. As of 2012, the World Bank



remains active in helping governments to intervene against hunger.[[28][21][1][24][29]](#page12)

Until at least the 1980s—and, to an extent, the 1990s—the dominant academic view concerning world hunger was that it was a problem of demand exceeding supply. Proposed solutions often focused on boosting food production, and sometimes on birth control. There were exceptions to this, even as early as the 1940s, [Lord Boyd-Orr,](https://en.wikipedia.org/wiki/John_Boyd_Orr,_1st_Baron_Boyd-Orr) the first head of the UN's FAO, had perceived hunger as largely a problem of distribution, and drew up comprehensive plans to correct this. Few agreed with him at the time, however, and he resigned after failing to secure support for his plans from the US and Great Britain. In 1998, [Amartya Sen](https://en.wikipedia.org/wiki/Amartya_Sen) won a [Nobel Prize](https://en.wikipedia.org/wiki/Nobel_Prize) in part for demonstrating that hunger in modern times is not typically the product of a lack of food. Rather, hunger usually arises from food distribution problems, or from governmental policies in the developed and developing world. It has since been broadly accepted that world hunger results from issues with the distribution as well as the production of food.[[25][26][27]](#page12) Sen's 1981 essay *Poverty and Famines: An Essay on Entitlement and Deprivation* played a prominent part in forging the new consensus.[[1][30]](#page12)



In 2007 and 2008, rapidly increasing food prices caused a [global food crisis.](https://en.wikipedia.org/wiki/2007–08_world_food_price_crisis) [Food riots](https://en.wikipedia.org/wiki/Food_riot) erupted in several dozen countries; in at least two cases, [Haiti](https://en.wikipedia.org/wiki/Haiti) and [Madagascar,](https://en.wikipedia.org/wiki/Madagascar) this led to the toppling of governments. A second *global food crisis* unfolded due to the spike in food prices of late 2010 and early 2011. Fewer food riots occurred, due in part to greater availability of food stock piles for relief. However, several analysts argue the food crisis was one of the causes of the [Arab Spring.](https://en.wikipedia.org/wiki/Arab_Spring)[[24][31][32]](#page12)



**Efforts since the global 2008 crisis**

In the early 21st century, the attention paid to the problem of hunger by the leaders of advanced nations such as those that form the [G8](https://en.wikipedia.org/wiki/G8) had somewhat subsided.[[31]](#page12) Prior to 2009, large scale efforts to fight hunger were mainly undertaken by governments of the worst affected countries, by civil society actors, and by multilateral and regional organizations. In 2009, Pope Benedict published his third encyclical, [Caritas in Veritate,](https://en.wikipedia.org/wiki/Caritas_in_Veritate) which emphasised the importance of fighting against hunger. The encyclical was intentionally published immediately before the [July 2009 G8 Summit](https://en.wikipedia.org/wiki/35th_G8_summit) to maximise its influence on that event. At the Summit, which took place at [L'Aquila](https://en.wikipedia.org/wiki/L'Aquila) in central Italy, the *L'Aquila Food Security Initiative* was launched, with a total of US$22 billion



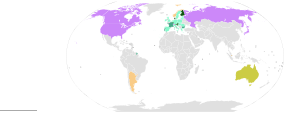
committed to combat hunger.[[33][34]](#page12)

Food prices fell sharply in 2009 and early 2010, though analysts credit this much more to farmers increasing production in response to the 2008 spike in prices, than to the fruits of enhanced government action. However, since the 2009 G8 summit, the fight against hunger became a high-profile issue among the leaders of the worlds major nations, and was a prominent part of the agenda for the [2012 G-20 summit.](https://en.wikipedia.org/wiki/2012_G-20_Mexico_summit)[[31][35][36]](#page12)



In April 2012, the [Food Assistance Convention](https://en.wikipedia.org/wiki/Food_Assistance_Convention) was signed, the world's first legally binding international agreement on food aid. The May 2012 [Copenhagen Consensus](https://en.wikipedia.org/wiki/Copenhagen_Consensus) recommended that efforts to combat hunger and malnutrition should be the first priority for politicians and private sector philanthropists looking to maximize the effectiveness of aid spending. They put this ahead of

other priorities, like the fight against [malaria](https://en.wikipedia.org/wiki/Malaria) and [AIDS.](https://en.wikipedia.org/wiki/AIDS)[[37]](#page12) Also in May 2012, U.S. President [Barack Obama](https://en.wikipedia.org/wiki/Barack_Obama) launched a "new alliance for food security and nutrition"—a broad partnership between private sector, governmental and civil society actors—that aimed to "...achieve sustained and inclusive agricultural growth and raise 50 million people out of poverty over the next 10 [years."](https://en.wikipedia.org/wiki/2012_Olympic_hunger_summit)[[25][35][38][39]](#page12) [The UK's prime minister David Cameron held a hunger](https://en.wikipedia.org/wiki/2012_Olympic_hunger_summit)





Affected areas in the western [Sahel](https://en.wikipedia.org/wiki/Sahel) belt during the [2012 drought.](https://en.wikipedia.org/wiki/2012_Sahel_drought)

or food.[[40]](#page12) Europe, with its more generous welfare system, had little awareness of domestic hunger until the food price inflation that began in late 2006, and

especially as austerity-imposed welfare cuts began to take effect in 2010. Various surveys reported that upwards of 10% of Europe's population had begun to suffer from food insecurity. Especially since 2011, there has been a substantial increase in grass roots efforts to help the hungry by means of food banks, within both the UK and continental Europe.[[7][41][42][43][44]](#page12)

By July 2012, the [2012 US drought](https://en.wikipedia.org/wiki/2012_US_drought) had already caused a rapid increase in the price of grain and soy, with a knock on effect on the price of meat. As well as affecting hungry people in the US, this caused prices to rise on the global markets; the US is the world's biggest exporter of food. This led to much talk of a possible third 21st century global food crisis. The *Financial Times* reported that the [BRICS](https://en.wikipedia.org/wiki/BRICS) may not be as badly affected as they were in the earlier crises of 2008 and 2011. However, smaller developing countries that must import a substantial portion of their food could be hard hit. The UN and [G20](https://en.wikipedia.org/wiki/G20) has begun contingency planning so as to be ready to intervene if a third global crisis breaks



out.[[28][32][45][46]](#page13) By August 2013 however, concerns had been allayed, with above average grain harvests expected from major exporters, including Brazil, Ukraine and the U.S.[[47]](#page13) 2014 also saw a good worldwide harvest, leading to speculation that grain prices could soon begin to fall.[[48]](#page13)

In an April 2013 summit held in [Dublin](https://en.wikipedia.org/wiki/Dublin) concerning Hunger, Nutrition, [Climate Justice,](https://en.wikipedia.org/wiki/Climate_Justice) and the post 2015 MDG framwework for global justice, Ireland's [President Higgins](https://en.wikipedia.org/wiki/Michael_D._Higgins) said that only 10% of deaths from hunger are due to armed conflict and natural disasters, with ongoing hunger being both the "greatest ethical failure of the current global system" and the "greatest ethical challenge facing the global community."[[49]](#page13) $4.15 billion of new commitments were made to tackle hunger at a June 2013 [Hunger Summit held in London, hosted by the governments of Britain and Brazil, together with The Children's Investment Fund](https://en.wikipedia.org/wiki/The_Children's_Investment_Fund_Foundation) [Foundation.](https://en.wikipedia.org/wiki/The_Children's_Investment_Fund_Foundation)[[50][51]](#page13)



Despite the hardship caused by the [2007–2009 financial crisis](https://en.wikipedia.org/wiki/Financial_crisis_of_2007–2008) and global increases in food prices that occurred around the same time, the UN's global statistics show close to year on year reductions in the numbers suffering from hunger around the world. By 2019 however, evidence had mounted that this progress seems to have gone into reverse over the last four years. The numbers suffering from hunger had risen both in absolute terms, and very slighly even as a percentage of the world's population.[[52][53][10]](#page11)

**Hunger relief organisations**



Many thousands of hunger relief organisations exist across the world. Some but not all are entirely dedicated to fighting hunger. They range from independent soup kitchens that serve only one locality, to global organisations. Organisations working at the global and regional level will often focus much of their efforts on helping hungry communities to better feed themselves, for example by sharing agricultural technology. With some exceptions, organisations that work just on the local level tend to focus more on providing food directly to hungry people. Many of the entities are connected by a web of national, regional and global alliances that help them share resources, knowledge, and coordinate efforts.[[54]](#page13)

**Global**

The United Nations is central to global efforts to relieve hunger, most especially through the [FAO,](https://en.wikipedia.org/wiki/FAO) and also via other agencies:



such as [WFP,](https://en.wikipedia.org/wiki/WFP) [IFAD,](https://en.wikipedia.org/wiki/IFAD) [WHO](https://en.wikipedia.org/wiki/WHO) and [UNICEF.](https://en.wikipedia.org/wiki/UNICEF) The FAO's [EndingHunger](https://en.wikipedia.org/wiki/Food_and_Agriculture_Organization_of_the_United_Nations" \l "Online_campaign_against_hunger_campaign) campaign is an online communication campaign aimed at raising awareness of the hunger problem. It has created viral videos depicting celebrities voicing their anger about the large number of hungry people in the world.



After the [Millennium Development Goals](https://en.wikipedia.org/wiki/Millennium_Development_Goals) expired in 2015, the [Sustainable Development Goals](https://en.wikipedia.org/wiki/Sustainable_Development_Goals) (SDGs) became key objectives to



shape the world's response to development challenges such as hunger. In particular Goal 2: *Zero Hunger* sets globally agreed targets to end hunger, achieve food security and improved nutrition and promote sustainable agriculture.[[55]](#page13)

Aside from the UN agencies themselves, hundreds of other organisations address the problem of hunger on the global level. These include national governments, religious groups, international charities and in some cases international corporations. Though except perhaps in the cases of charities, the priority these organisations assign to hunger relief may vary from year to year. In many cases the organisations partner with the UN agencies, though often they can pursue independent goals. For example, [as consensus began to form](https://en.wikipedia.org/wiki/Post-2015_Development_Agenda) for the SDG *zero hunger* goal to aim to end hunger by 2030, a number of organizations formed initiatives with the more ambitious target to achieve this outcome early, by 2025:



In 2013 Caritas International started a Caritas-wide initiative aimed at ending systemic hunger by 2025. The One human family, food for all campaign focuses on awareness raising, improving the impact of Caritas programs and



advocating the implementation of the right to food.[[56]](#page13)

The partnership [Compact2025 (https://web.archive.org/web/20151013222109/http://www.compact2025.org/),](https://web.archive.org/web/20151013222109/http://www.compact2025.org/) led



by [IFPRI](https://en.wikipedia.org/wiki/International_Food_Policy_Research_Institute) with the involvement of UN organisations, NGOs and private foundations[[57]](#page13) develops and disseminates evidence-based advice to politicians and other decision-makers aimed at ending hunger and undernutrition in the coming 10 years, by 2025.[[58]](#page13) It bases its claim that hunger can be ended by 2025 on a report by [Shenggen Fan](https://en.wikipedia.org/wiki/Shenggen_Fan) and [Paul Polman](https://en.wikipedia.org/wiki/Paul_Polman) that analyzed the experiences from China, Vietnam, Brazil and Thailand and concludes that



eliminating hunger and undernutrition was possible by 2025.[[59]](#page13)



In June 2015, the [European Union](https://en.wikipedia.org/wiki/European_Union) and the [Bill & Melinda Gates Foundation](https://en.wikipedia.org/wiki/Bill_%26_Melinda_Gates_Foundation) have launched a partnership to combat undernutrition especially in children. The program will initiatilly be implemented in Bangladesh, Burundi, Ethiopia, Kenya, Laos and Niger and will help these countries to improve information and analysis about nutrition



so they can develop effective national nutrition policies.[[60]](#page13)

**Sustainable Development Goals**

Goal # 2 of the UN's Sustainable Development Goals states the following objective:



SUSTAINABLE DEVELOPMENT GOAL 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture[[61]](#page13)

Various targets and indicators are associated to this objective. The first target address directly hunger and the second malnutrition. Others targets are partly instrumental to reduce hunger such as increasing agricultural productivity and incomes of small scale food producers (2.3), sustainable food production systems and resilient agricultural practices (2.4) and genetic diversity of seeds

and access to "arising benefits arising from the utilization of genetic resources and associated traditional knowledge" (2.5)United [Nations Department of Economic and Social Affaires. "Goal 2 .:. Sustainable Development Knowledge Platform" (https://sustain](https://sustainabledevelopment.un.org/sdg2) [abledevelopment.un.org/sdg2). *Sustainable Development Knowledge Platform*. United Nations. Retrieved 6 October 2018.. Other](https://sustainabledevelopment.un.org/sdg2)



targets (2.A, 2.B and 2.C) are means of implementation to facilitate 2.1-2.5 targets.[[62]](#page13)

Volunteers pass out food items from a food bank run by [Feeding America](https://en.wikipedia.org/wiki/Feeding_America)

A report by the [International Food Policy Research Institute](https://en.wikipedia.org/wiki/International_Food_Policy_Research_Institute) (IFPRI) of 2013 argued that the emphasis of the SDGs should be on eliminating hunger and under-nutrition, rather than on poverty, and that attempts should be made to do so by 2025 rather than 2030.[[59]](#page13) The argument is based on an analysis of experiences in China, Vietnam, Brazil, and Thailand and the fact that people suffering from severe hunger face extra impediments to improving their lives, whether it be by education or work. Three pathways to achieve this were identified: 1) agriculture-led; 2) social protection- and nutrition- intervention-led; or 3) a combination of both of these approaches.[[59]](#page13)



**Regional**

Much of the world's reigional alliances are located in Africa. For example, the *Alliance for Food Sovereignty in Africa* or the [Alliance for a Green Revolution in Africa.](https://en.wikipedia.org/wiki/Alliance_for_a_Green_Revolution_in_Africa)[[63][54]](#page13)



The [Food and Agriculture Organization](https://en.wikipedia.org/wiki/Food_and_Agriculture_Organization) of the UN has created a partnership that will act through the [African Union's](https://en.wikipedia.org/wiki/African_Union) CAADP framework aiming to end hunger in Africa by 2025. It includes different interventions including support for improved food production, a strengthening of social protection and integration of the right to food into national legislation.[[64]](#page13)



**National**

Examples of hunger relief organisations that operate on the national level include [The Trussell Trust](https://en.wikipedia.org/wiki/The_Trussell_Trust) in the U.K. and [Feeding America](https://en.wikipedia.org/wiki/Feeding_America) in the U.S.[[65]](#page14)



**Local**

**Food bank**

A [food bank](https://en.wikipedia.org/wiki/Food_bank) (or foodbank) is a non-profit, charitable organization that aids in the distribution of food to those who have difficulty purchasing enough to avoid hunger. Food banks tend to run on different operating models depending on where they are located. In the U.S., Australia, and to some extent in Canada,



foodbanks tend to perform a warehouse type function, storing and delivering food to front line food orgs, but not giving it directly to hungry peoples themselves. In much of Europe and elsewhere, food banks operate on the *front line* model, where they hand out parcels of uncooked food direct to the hungry, typically giving them enough for several meals which they can eat in their homes. In the U.S and Australia, establishments that hand out uncooked food to individual people are instead called *food pantries*, *food* *shelves* or *food closets'.*[[66]](#page14)

In [Less Developed Countries,](https://en.wikipedia.org/wiki/Less_Developed_Countries) there are charity-run food banks that operate on a semi-commercial system that differs from both the more common "warehouse" and "frontline" models. In some rural [LDCs](https://en.wikipedia.org/wiki/Least_developed_country) such as Malawi, food is often relatively cheap and plentiful for the first few months after the harvest, but then becomes more and more expensive. Food banks in those areas can buy large amounts of food shortly after the harvest, and then as food prices start to rise, they sell it back to local people throughout the year at well below market prices. Such food banks will sometimes also act as centres to provide small holders and subsistence farmers with various forms of support.[[67]](#page14)



**Soup kitchen**

A [soup kitchen,](https://en.wikipedia.org/wiki/Soup_kitchen) **meal** **center,** or **food kitchen** is a place where [food](https://en.wikipedia.org/wiki/Food) is offered to the hungry for free or at a below market [price.](https://en.wikipedia.org/wiki/Price) Frequently located in lower-income neighborhoods, they are often staffed by [volunteer](https://en.wikipedia.org/wiki/Volunteering) organizations, such as [church or community groups. Soup kitchens sometimes obtain food from a food](https://en.wikipedia.org/wiki/Food_bank) [bank for free or at a low price, because they are considered a](https://en.wikipedia.org/wiki/Food_bank) [charity,](https://en.wikipedia.org/wiki/Charitable_organization) [which](https://en.wikipedia.org/wiki/Food_bank) makes it easier for them to feed the many people who require their services.



A soup kitchen in [Montreal,](https://en.wikipedia.org/wiki/Montreal) [Quebec,](https://en.wikipedia.org/wiki/Quebec) [Canada](https://en.wikipedia.org/wiki/Canada) in 1931.

**Others**

Local establishments calling themselves "food banks" or "soup kitchens" are often run either by Christian churches or less frequently by secular civil society groups. Other religions carry out similar hunger relief efforts, though sometimes with slightly different methods. For example, in the Sikh tradition of [Langar,](https://en.wikipedia.org/wiki/Langar_(Sikhism))



food is served to the hungry direct from Sikh temples. There are exceptions to this, for example in the UK Sikhs run some of the food banks, as well as giving out food direct from their [Gurdwara's.](https://en.wikipedia.org/wiki/Gurdwara)[[68][69]](#page14)



**Hunger and gender**



In both developing and advanced countries, parents sometimes go without food so they can feed their children. Women, however, seem more likely to make this sacrifice than men. World Bank studies consistently find that about 60% of those who are hungry are female. The apparent explanation for this imbalance is that, compared to men, women more often forgo meals in order to feed their children. Older sources sometimes claim this phenomenon is unique to developing countries, due to greater sexual inequality. More recent findings suggested that mothers often miss meals in advanced economies too. For example, a 2012 study undertaken by [Netmums](https://en.wikipedia.org/wiki/Netmums) in the UK found that one in five mothers sometimes



misses out on food to save their children from hunger.[[28][70][71]](#page14)

In several periods and regions, gender has also been an important factor determining whether or not victims of hunger would make suitable examples for generating enthusiasm for hunger relief efforts. James Vernon, in his *Hunger: A* *Modern History*, wrote that in Britain before the 20th century, it was generallyonly women and children suffering from hunger who could arouse compassion. Men who failed to provide for themselves and their families were often regarded with contempt.[[20]](#page11)

[*Migrant Mother*](https://en.wikipedia.org/wiki/Migrant_Mother) by[Dorothea Lange](https://en.wikipedia.org/wiki/Dorothea_Lange)(1936).



This changed after [World War](https://en.wikipedia.org/wiki/World_War_I) I, where thousands of men who had proved their manliness in combat found themselves unable to secure employment. Similarly, female gender could be advantageous for those wishing to advocate for hunger relief, with Vernon [writing that being a woman helped Emily Hobhouse draw the plight of hungry people to wider attention during the Second Boer](https://en.wikipedia.org/wiki/Second_Boer_War) [War.](https://en.wikipedia.org/wiki/Second_Boer_War)[[20]](#page11)



**See also**



[Action Against Hunger](https://en.wikipedia.org/wiki/Action_Against_Hunger)



[*A Place at the Table*](https://en.wikipedia.org/wiki/A_Place_at_the_Table)



[Basic income](https://en.wikipedia.org/wiki/Basic_income)



[Category:Hunger relief organizations](https://en.wikipedia.org/wiki/Category:Hunger_relief_organizations)



[Donation](https://en.wikipedia.org/wiki/Donation)



[Economic issues](https://en.wikipedia.org/wiki/Economic_issues)



[Famine](https://en.wikipedia.org/wiki/Famine)



[Famine relief](https://en.wikipedia.org/wiki/Famine_relief)



[Famine scales](https://en.wikipedia.org/wiki/Famine_scales)



[Feeding America](https://en.wikipedia.org/wiki/Feeding_America)



[Fome Zero](https://en.wikipedia.org/wiki/Fome_Zero) (Hunger 0)



[Food Bank](https://en.wikipedia.org/wiki/Food_Bank)



[Food Donation Connection](https://en.wikipedia.org/wiki/Food_Donation_Connection)



[Food Matters](https://en.wikipedia.org/wiki/Food_Matters)



[Food production](https://en.wikipedia.org/wiki/Food_production)



[Global Hunger Index](https://en.wikipedia.org/wiki/Global_Hunger_Index)



[Homelessness](https://en.wikipedia.org/wiki/Homelessness)



[Human rights](https://en.wikipedia.org/wiki/Human_rights)



[Hunger in the United Kingdom](https://en.wikipedia.org/wiki/Hunger_in_the_United_Kingdom)



[Hunger in the United States](https://en.wikipedia.org/wiki/Hunger_in_the_United_States)



[Hunger marches](https://en.wikipedia.org/wiki/Hunger_marches)



[The Hunger Project](https://en.wikipedia.org/wiki/The_Hunger_Project)



[Income inequality](https://en.wikipedia.org/wiki/Income_inequality)



[Integrated Food Security Phase Classification](https://en.wikipedia.org/wiki/Integrated_Food_Security_Phase_Classification)



[Malnutrition](https://en.wikipedia.org/wiki/Malnutrition)



[Millennium Development Goals](https://en.wikipedia.org/wiki/Millennium_Development_Goals) (Goal 1)



[Muselmann](https://en.wikipedia.org/wiki/Muselmann)



[National Security Study Memorandum 200](https://en.wikipedia.org/wiki/National_Security_Study_Memorandum_200) (1974)



[Oxfam](https://en.wikipedia.org/wiki/Oxfam)



[Poverty trap](https://en.wikipedia.org/wiki/Poverty_trap)



[Project Open Hand](https://en.wikipedia.org/wiki/Project_Open_Hand)



[Right to food](https://en.wikipedia.org/wiki/Right_to_food)



[Social programs](https://en.wikipedia.org/wiki/Social_programs)



[Soup kitchen](https://en.wikipedia.org/wiki/Soup_kitchen)



[Starvation](https://en.wikipedia.org/wiki/Starvation)



[Starvation response](https://en.wikipedia.org/wiki/Starvation_response)



[United Nations Millennium Declaration](https://en.wikipedia.org/wiki/United_Nations_Millennium_Declaration)



[Universal Declaration on the Eradication of Hunger and Malnutrition](https://en.wikipedia.org/wiki/Universal_Declaration_on_the_Eradication_of_Hunger_and_Malnutrition) (1974)



[2007–08 world food price crisis](https://en.wikipedia.org/wiki/2007–08_world_food_price_crisis)