Economic and Social Commission for Western Asia

Food and Agriculture
Organization of the United Nations

The League Of Arab States
Arab Organization For Agricultural Development

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Manual for Monitoring Food Security in the Arab Region

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Background

Within the context of Food Security, ESCWA is implementing a project on "Promoting food and water security through cooperation and capacity development in the Arab region, funded by the Swedish International Cooperation Agency (Sida) that, among others, includes a component on enhancing capacity to assess the status of food security in the Arab region.

In this respect, a Regional Food Security Monitoring Framework for Arab countries was developed in consultation and coordination with the Arab Organization for Agricultural Development (AOAD), the Food and Agricultural Organization of the United Nations (UN-FAO), Arab countries' national focal points and other experts from the region.

The framework takes into consideration regional specificities and their alignment to the 2030 Agenda for Sustainable Development to highlight national strengths, weaknesses and potential priorities for focused interventions under the 4 dimensions of Food Security (availability, access, utilization and stability).

On 28 March 2019, the framework was adopted by the Executive Council of AOAD after being presented to its General Assembly in its 35th Session.

Introduction

The framework is built using three outcome indicators; referred to as "core indicators". Revolving around them, are 21 causal indicators, distributed among the four dimensions of Food Security (availability, access, utilization and stability) according to the scope and nature of each indicator.

This Manual provides a detailed description of each of the 24 selected indicators and method of their computation whenever applicable. Each indicator listing comprises a full name, definition or description, method of measurement if applicable, justification for selection, linkage to the SDGs, possible data source as well as the normalization process.

Additional information on each indicator's relationship and effect on food security and potential action areas, in addition to its relevance to the Arab Region are detailed in a related publication entitled "Tracking Food Security in the Arab region" (https://www.unescwa.org/sites/www.unescwa.org/files/publications/files/tracking-food-security-arab-region-english_1.pdf).

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Normalization of the Indicators

All indicators in this framework are normalized to a 0-10 scale with 0 being the worst performance and 10 being the best. The normalization is performed using the following equations:

When a high value is best (e.g., yields): (X–min) / (max–min) *10

When a low value is best (e.g., obesity): (X–max) / (min–max) *10

X= value to be normalized

For those indicators where a high value is synonymous to a worsening situation, such as the prevalence of undernourishment or stunting among children under 5 years of age old then the second equation is used (inverted) otherwise the first equation (non-inverted) is used.

Why normalize?

The normalization is required to ease the interpretation of results as all indicators use the same scale. Additionally, it unifies the layout so that all indicators use a similar scale rather than having some indicators ranging from 0 to 100%, with others ranging from 0 to 1 or 1 to 5, etc. This allows us, as well, to fit all indicators on a same chart. Hence, a score between 0 and 10 was computed based on their original numerical values.

What are examples of minimum and maximum values?

Minimum and maximum are global values meaning that they are worldwide minimum and maximum and not country or region specific. This makes the framework more stable and thus less subject to swings as conditions change at the local or regional levels.

Why those values?

The 2010 global minimums and maximums were selected for the normalization process as:

- 2010 had the most data for the most indicators for the most countries and as such could serve as a base line to be used, in this case, 2010.
- To compare the performance between 2 periods (here, 2010 vs. latest data), the same baseline had to be used, in this case, 2010.

Note that the baseline can be changed, therefore, the minimums and maximums of 2010 mentioned in this manual are only indicative and may be changed in the future to reflect the prevailing reality. If the new chosen baseline is 2015, for example, the global minimums and global maximums of 2015 would be used when normalizing both 2015 data and the latest data.

The global values were chosen instead of 0% and 100% as minimums and maximums to allow for a more realistic scale. In real life, values of 0% or 100% are seldom reached regardless of the indicator or the level of development/income of the country, e.g. no country can have 0% or 100% obesity, poverty or unemployment. Thus, using those values would imply comparing countries to perfect or imperfect case scenarios. On the other hand, using the minimum and maximum values for each of the individual countries would lead to scores, which are not comparable and potentially highly variable depending on the prevailing situation.

Thus, a low-income country could have a good performance on undernourishment if it experiences a slight improvement between the reference year and the current one, while the overall level of undernourishment would remain substantially high. Vice versa, a high-income country could have a poor performance on undernourishment if it experienced a slight increase while, overall, it has low levels of undernourishment. As a result, the middle ground has meant the use of global minimums and maximums to allow for comparability while not penalizing countries through the use of perfect or imperfect (unachievable) levels while also avoiding a high variability due to local conditions.

Notes

Core Indicators

CO1: Undernourishment (%)

Full name

Prevalence of undernourishment (PoU) (in per cent).

Definition or description

As per FAO, the prevalence of undernourishment (PoU) is an estimate of the proportion of the population whose habitual food consumption is insufficient to provide the dietary energy required to maintain a normal active and healthy life. It is expressed as a percentage.[1]

Method of measurement

Usually, data for this indicator can be obtained already computed.[2]

More details on the methodology for computing the prevalence of undernourishment are available in "Annex 2" of the "State of Food Insecurity in the World 2015" report[3] and on the Indicator's official metadata page.[4]

Justification

Undernourishment is closely linked to food availability, access and thus, to overall food security. It is linked to various illnesses, mortality and childhood metabolic imprinting leading to long term developmental challenges. Monitoring undernourishment is crucial for tracking food security performance globally and more specifically in the Arab region in the light of recent and ongoing conflicts and protracted crisis.

Link to SDGs

This indicator is linked to SDG 2:

- *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.*
- *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.*

Possible Data source

This indicator is calculated by applying the estimated prevalence of undernourishment to total population in each period and is expressed as a percentage. Related data can be found on the FAO data page on the link below: http://www.fao.org/faostat/en/?#data/FS.

Normalization

This indicator was normalized to scale from 0 to 10 as a **reversed indicator**, meaning that the lowest value represents the best-case scenario (minimum value in the normalization formula) and the highest value represents the worst-case scenario (maximum value in the normalization formula).

Currently figures of the reference year 2010 were used as global minimum and maximum values and are from FAOSTAT. They are subject to change if the reference year is changed:

Minimum: 2.5% is fixed as the best-case scenario with a score of 10 as below that value PoU is not measured.
Maximum: The global average is considered as the worst-case scenario with a score of 0. The cap for 2010 is 10.8%.

Notes

C02: Food Insecurity Experience Scale (%)

Full name

Prevalence of moderate or severe food insecurity based on the Food Insecurity Experience Scale (FIES) (in per cent).

Definition or description

People experiencing moderate food insecurity face uncertainties about their ability to obtain food and might be forced during some time periods to reduce the quality and/or quantity of the food they consume due to lack of means.

People facing severe food insecurity, on the other hand, have likely run out of food, experienced hunger and, at the most extreme, gone for days without eating, putting their health and well-being at grave risk[5].

This indicator is used to estimate the percentage of individuals in the population who have experienced food insecurity at moderate or severe levels.

The FAO provides data for "moderate or severe" and, separately, for "severe" food insecurity. First choice data use should be for "moderate or severe" food insecurity while data "severe" food insecurity would be the alternate choice if the previous is not available. In the latter case, an explanatory footnote would be added.

Method of measurement

This FAO-developed indictor is built around a questionnaire that consists of 8 questions that investigates people's experience with access to food. Further details on the method of calculation can be found on the indicator's metadata link[6].

Data can be obtained already computed.

Justification

An inability to access food results in a series of determined experiences and conditions. They range from being concerned about the ability to obtain enough food, to the need to compromise on the quality or diversity of food consumed, to being forced to reduce the intake of food or to skip meals, up to the extreme condition of not being able to access food regularly. This indicator relates to the four dimensions of food security and is crucial for tracking food security performance. In the Arab region, it helps as a quick appraisal of the food security situation in light of recent and ongoing conflicts and protracted crisis.

Link to SDGs

This indicator is linked to SDG 2, and is the SDG Indicator 2.1.2

- *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.*

- *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.*

Possible Data source

Related data can be found on FAOSTAT http://www.fao.org/faostat/en/#data/FS

Normalization

This indicator is normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (minimum value in the normalization formula) and the highest value represents the worst-case scenario (maximum value in the normalization formula). Being a newly developed indicator, figures for years prior to 2014 are not available. The highest global average for severe food insecurity was used to assign the maximum value while, FIES minimum value is capped at 2.5% while the maximum value is as the global average for 2018 (latest data) for severe food insecurity, noting that the global average for moderate or severe food insecurity could also be used.

Depending on data availability, one of these two indicators could be used, which are extracted from FAOSTAT or the latest report on the State of Food and Nutrition in the World:

Prevalence of moderate or severe food insecurity:
Minimum: 2.5% representing best case scenario with a score of 10
Maximum: 26.4% as the worst-case scenario with a score of 0

Prevalence of severe food insecurity:

Minimum: 2.5% representing best case scenario with a score of 10
Maximum: 9.2% as the worst-case scenario with a score of 0

Published results are also available in the State of Food Security and Nutrition in the World, 2019[7].

Notes

CO3: Obesity (%)

Full name

Prevalence of obesity in the adult population (18 years and older) (in per cent).

Definition or description

As per WHO, obesity is defined as abnormal or excessive fat accumulation that may impair health. BMI is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a weight in kilograms divided by the square of height in meters (kg/m^2). Obesity is defined as having a Body Mass Index (BMI) equal or greater than 30.[8]

Method of measurement

This indicator accounts for the percentage of individuals in the adult population reaching or surpassing a BMI of 30 kg/m^2.

Data can be obtained already computed.

Justification

Obesity is due to overconsumption of calories usually associated with reduced physical activities. It leads to many illnesses and non-communicable diseases and impedes economic participation and growth. Low income groups suffer from obesity due to the overconsumption of cheap, unhealthy foods, especially in the absence of healthy food alternatives. This indicator was specifically selected in this framework because obesity rates in the Arab region are escalating at alarming rates becoming the highest in the world with nearly one quarter of the population estimated as obese (ESCWA, 2017).[9] This calls for urgent action especially as food consumption patterns are still transitioning towards westernized habits.

Link to SDGs

There is no direct mention of "obesity" in the SDGs, but as it is related to food consumption quality and patterns leading to the widespread increase of noncommunicable diseases, it relates to the SDGs through SDG 3 "Good health and wellbeing":

- *Target 3.4: By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.*

Possible Data source

Related Obesity data can be found on WHO:
http://apps.who.int/gho/data/node.main.A900A?lang=en

Normalization

This indicator was normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (minimum value in the normalization formula) and the highest value represents the worst-case scenario (maximum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values. They are subject to change if the reference year is changed. Obesity is capped with a fixed minimum and the global average as the maximum value with related data available from WHO or FAOSTAT:

Minimum: 2.5% representing best-case scenario with a score of 10.
Maximum: 11.7% as the worst-case scenario with a score of 0.

Notes

Food Availability Indicators

AV1: Wheat yield (%)

Full name

Primary wheat yield as a percentage of potentially achievable yield (in per cent).

Definition or description

This indicator measures the wheat yield gap, a major limiting factor for food availability from national sources. It was developed for the specific purpose of this monitoring framework. It estimates the recorded primary cereal yield as a percentage of a country's potentially achievable yield, to assess whether countries are able to reach their production potential.

Method of measurement

This indicator is not associated with an official metadata page as it was custom developed based on suggestions from experts. It needs to be computed using data from various sources. Data on potentially achievable wheat yield is from Mueller et al, 2012, a paper in Nature.10 The actual achieved wheat yield is extracted from FAOSTAT. The computation of the percentage should use the following authors' proposed formula:

$$\frac{\text{Achieved Yield}}{\text{Potentially Achievabe Yield}} \times 100$$

Justification

Closing the wheat yield gap would contribute to higher availability of food. Reducing the yield gap will decrease food import dependency. This indicator is particularly relevant to the Arab region as wheat is a major staple food, accounting for some 37% of total food supply (Solh, 2013).11 The region is also one of the largest cereal importers in the world.

Link to SDGs

This indicator is linked to SDG 2:

- *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.*

Possible Data source

Related Potential yield data was extracted from the following link:
https://www.nature.com/articles/nature11420?platform=oscar&draft=journal.
(Note: the article requires special access, purchase or subscription).

Related Achieved yield data can be found on the following link:
http://www.fao.org/faostat/en/?#data/QC

Normalization

This indicator was normalized to scale from 0 to 10, meaning that the highest value represents the best-case scenario (maximum value in the normalization formula, meaning the country is achieving its full potential) and the lowest value represents the worst-case scenario (minimum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values using the formula above. They are subject to change if the reference year is changed:

Minimum: 28% as the worst-case scenario with a score of 0.
Maximum: 142% representing best-case scenario with a score of 10.

Notes

AV2: Agriculture Orientation Index (Index)

Full name

The Agricultural Orientation Index (AOI) for Government Expenditures (as an index).

Definition or description

As per FAO, the Agriculture Orientation Index (AOI) for Government Expenditures is estimated as the agriculture share of government expenditures divided by the agriculture value added share of GDP, where agriculture refers to crop and livestock production, forestry, fishing and hunting.[12]

Method of measurement

The measure is a currency-free index and is the ratio of the two shares mentioned above. An Agriculture Orientation Index (AOI) greater than 1 point to a higher governmental orientation towards the agriculture sector, as it receives a higher share of government spending relative to its contribution to economic value-added. An AOI of less than 1 point indicates a lower governmental orientation towards agriculture, while an AOI equal to 1 reflects neutrality in a government's orientation towards the agriculture sector.

Therefore, the best-case scenario would be when both numerator and denominator are proportionally scaled, as the closer the ratio is to 1, the more proportionate are the investments. More details are available on the indicator's metadata page.[13]

Data can be obtained already computed.

Justification

A country's food security status is affected by the government spending towards agriculture as it aims to enhance the sector's productive capacity, thus translating into an improved overall contribution of the sector to total economy. The agriculture orientation index fell from 0.42 in 2001 to 0.26 in 2017 worldwide reflecting less investments towards the agricultural sector. For the 2015-2017 period, the average AOI was highest in Western Asia & Northern Africa (0.42) and lowest in Sub-Saharan Africa (0.02).[14]

Link to SDGs

This indicator is linked to SDG 2:

- *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 countr*ies

Possible Data source

Related data can be found on FAOSTAT: http://www.fao.org/faostat/en/#data/IG.

Normalization

This indicator was normalized to scale from 0 to 10, meaning that the highest value represents the best-case scenario (maximum value in the normalization formula) and the lowest value represents the worst-case scenario (minimum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values. They are subject to change if the reference year is changed and are extracted from FAOSTAT:

Minimum: 0.02 as the worst-case scenario with a score of 0.
Maximum: 8.5 representing best-case scenario with a score of 10.

Notes

AV3: Food losses (%)

Full name

The Food Loss as a percentage of total food available (in per cent).

Definition or description

As per FAO, food loss is referred to as the amount of a commodity lost through wastage during the year at all stages between the level at which production is recorded and the household, i.e. storage and transportation. Losses occurring before and during harvest are excluded. Waste from both edible and inedible parts of the commodity occurring in the household is also excluded. Quantities lost during the transformation of primary commodities into processed products are taken into account in the assessment of respective extraction/conversion rates. Waste is often estimated as a fixed percentage of availability, the latter being defined as production plus imports plus stock withdrawals".[15]

Method of measurement

The data can be obtained from FAOSTAT's food balance sheets,[16] for each individual country for a specific year. The percentage of food lost is computed using the following authors' suggested formula:

$$\frac{\text{Losses}}{\text{(Imports+Production+Exports)}} \text{ x100}$$

where losses and available food are expressed in tons

Justification

Food losses impact food availability, access and utilization. Preventing food loss could lead to the availability of more safe and nutritious food. It is a concern for the Arab region where food loss is due to deficient practices and infrastructure in production, handling and processing including when imported despite that the region is highly dependent on food import (ESCWA, 2017).[17]

Link to SDGs

This indicator is linked to SDG 12:

- *Target 12.3: By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.*

Possible Data source

FAOSTAT's food balance sheets, for each individual country in a specific year
http://www.fao.org/faostat/en/#data/FBS

Normalization

This indicator was normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (minimum value in the normalization formula) and the highest value represents the worst-case scenario (maximum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values. They are subject to change if the reference year is changed and intermediary data is extracted from FAOSTAT food balance sheets.

Minimum: 0% representing best-case scenario with a score of 10.
Maximum: 41.3% as the worst-case scenario with a score of 0.

Notes

AV4: Average Dietary Energy Supply Adequacy (%)

Full name

Average Dietary Energy Supply Adequacy (ADESA) (in per cent).

Definition or description

As per FAO, the indicator expresses the Dietary Energy Supply (DES) as a percentage of the Average Dietary Energy Requirement (ADER).

Method of measurement

Each country's or region's average supply of calories for food consumption is normalized by the average dietary energy requirement estimated for its population to provide an index of adequacy of the food supply in terms of calories.

Data can be obtained already computed.

Justification

ADESA reflects the adequacy of the supplied dietary energy at the national level and therefore, food availability in terms of quantity. The quantity of food provided should fulfill the energy needs of the population to allow a healthy development.

Link to SDGs

This indicator is implicitly linked to SDG 2, and has a direct effect on food security as it reflects if the supplied food satisfies the population's caloric needs, more specifically:

- *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.*
- *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.*

Possible Data source

Related data can be accessed on FAOSTAT: http://www.fao.org/faostat/en/#data/FS.

Normalization

This indicator was normalized to scale from 0 to 10, meaning that the highest value represents the best-case scenario (maximum value in the normalization formula) and the lowest value represents the worst-case scenario (minimum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values. They are subject to change if the reference year is changed and were extracted from FAOSTAT.

Minimum: 81% as the worst-case scenario with a score of 0.
Maximum: 155% representing best-case scenario with a score of 10.

Notes

AV5: Import dependency (%)

Full name

Wheat Import Dependency Ratio (in per cent).

Definition

As per FAO, the cereal imports dependency ratio informs on the level of imported cereals compared to the country cereal production in the available domestic food supply of cereals.[18] Wheat is used as a proxy for cereal import and production since it is the main consumed cereal in the Arab region.

Method of measurement

The indicator is calculated using the below authors' suggested formula based on a three-year moving average, from 1990-1992 to 2009-2011, to smooth out the impact of abnormal years.

$$\frac{\text{(Import - Exports)}}{\text{(Imports+Production+Exports)}} \text{ x100}$$

Negative values indicate that the country is a net exporter of wheat.[19]

Justification

Cereals are the main source of dietary energy globally as well as in the Arab region and they constitute the bulk of the food imports. This indicator provides a measure of the dependence on cereal import. Focus is put on wheat as it is the most produced and consumed cereal in the Arab region. The greater the indicator, the higher the dependence hence the higher the vulnerability to the vagaries of global markets.

Link to SDGs

This indicator is related to SDG 2, as increased cereal availability through imports can contribute to ending hunger when local production cannot cover with local demand.

Possible Data source

Related data can be accessed on FAOSTAT: http://www.fao.org/faostat/en/#data/FS.

Normalization

This indicator was normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (used as minimum value in the normalization formula) and the highest value represents the worst-case scenario (used as a maximum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values. They are subject to change if the reference year is changed. Since Arab countries are largely importers of wheat, a cap was put on the minimum value, so it does not go below 0 (zero). Intermediary data to compute the global minimum and maximum was extracted from FAOSTAT:

Minimum: 0% representing best-case scenario with a score of 10.
Maximum: 100% as the worst-case scenario with a score of 0.

Notes

AV6: Agriculture water (%)

Full name

Share of water resources used in agriculture out of total renewable water resources (in per cent).

Definition or description

This indicator provides information about the sustainability of water use for food production. Agricultural water withdrawal is defined as[20] the Annual quantity of water withdrawn for irrigation, livestock and aquaculture purposes. It includes water from primary renewable and secondary freshwater resources, as well as water from over-abstraction of renewable groundwater or withdrawal from fossil groundwater, direct use of agricultural drainage water, direct use of (treated) wastewater and desalinated water.

Method of measurement

This indicator consists of the ratio of water withdrawn for agriculture to the total renewable water resources. The authors suggest using the following formula:

$$\frac{\text{Agricultural water withdrawal}}{\text{Total renewable water resources}} \text{ x100}$$

Total renewable water resources are defined as[21]: The sum of internal renewable water resources and external renewable water resources. It corresponds to the maximum theoretical yearly amount of water available for a country at a given moment.

Justification

Water is crucial for food production. The region is facing a growing scarcity of renewable water resources and unsustainable agricultural practices is leading to an overexploitation of its scarce freshwater resources.

Link to SDGs

This indicator was selected due to its direct and indirect relation to SDG 2, SDG 6, SDG 12 and SDG 15, as water usage is connected to agricultural practices, natural resource use, sustainable production and ecosystem health and desertification.

Possible Data Source

Related data can be found on AQUASTAT:
http://www.fao.org/nr/water/aquastat/data/query/

Normalization

This indicator was normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (minimum value in the normalization formula) and the highest value represents the worst-case scenario (maximum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values. They are subject to change if the reference year is changed. Caps were put on this indicator, so the minimum value never goes below 0% since there is always some amount of water used for agricultural purposes, while the maximum value would never go beyond 100% as using all water for agriculture purposes is unsustainable. Intermediary data is extracted from AQUASTAT:

Minimum: 0% representing best-case scenario with a score of 10.
Maximum: 100% as the worst-case scenario with a score of 0.

Notes

Food Access Indicators
AC1: Poverty (%)

Full name
Poverty headcount ratio (in per cent).

Definition or description
The poverty headcount ratio is the percentage of the population living under a determined poverty line. National estimates are based on population-weighted subgroup assessments from household surveys.[22] Poverty could be defined as a lack of adequate material possessions or income to cover needs.

Method of measurement
The World Bank has attempted to develop a common standard in measuring poverty, as cost of living across the world change. The international poverty line has to be intermittently updated using new PPP price data to reflect changes. A $3.20 a day threshold is a typical poverty line for countries classified as Lower Middle Income and it is used in lieu of the $1.9 a day proposed in the SDGs as it is more relevant to the majority of Arab countries .[23]

Data can be obtained already computed.

Justification
Poverty is a main determinant of economic access to food as it reflects a lack of means. The poverty headcount ratio is a good indicator to assess poverty levels in Arab countries as it affects the access to food and thus the status of food security.

Link to SDGs
This indicator is linked to several SDGs as follows:

SDG 1:

- *Target 1.1: By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day;*
- *Target 1.2: By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.*

SDG 8:

- *Target 8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.*

Possible Data Source

Related data can be collected from the World Bank.
https://data.worldbank.org/indicator/SI.POV.LMIC?end=2017&name_desc=false&start=2000

Normalization

This indicator was normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (minimum value in the normalization formula) and the highest value represents the worst-case scenario (maximum value in the normalization formula).

For this indicator, as the SDGs call to halve poverty by 2030, the maximum value is suggested to be half the Arab average. Currently a figure for 2010 was not available and thus the maximum was computed based on the latest year data available. They are subject to change if the reference year is changed and were obtained from the World Bank:

Minimum: 0% representing best-case scenario with a score of 10.
Maximum: 8.3% as the worst-case scenario with a score of 0.

Notes

AC2: Food consumption (%)

Full name

Share of food consumption expenditure in total household consumption expenditure (in per cent).

Definition or description

Food consumption expenditure refers to the monetary value of acquired food, purchased and non-purchased, including non-alcoholic and alcoholic beverages as well as food expenses on away from home consumption in bars, restaurants, food courts, work canteens, street vendors, etc.[24]

Method of measurement

This indicator is calculated with data from Household Consumption and Expenditure Surveys (HCES) that comprise the monetary value of household consumption disaggregated into food and non-food items. The portion of household spending on food is suggested to be computed as follows by the authors:

The monetary value of non-purchased items, comprising consumption from own production and in-kind payments and transfers, must be calculated from available price information.[25]

$$\frac{\text{Expenditure on food}}{\text{Total Expenditure}} \times 100$$

Data can be obtained already computed or alternatively sub-indicator data could be obtained from various sources and inserted into the above formula for computation.

Justification

The share of food consumption expenditure in total household consumption expenditure allows the assessment of how affordable it is for people to access food and therefore how food secure a household is. Spending money on food is a fundamental requirement for survival. The more vulnerable a household is, the larger is the share of household income spent on food.

Link to SDGs

This indicator is related to many SDGs as follows:

SDG 1:

- *Target 1.5: By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.*

SDG 2: 

- *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.*

SDG 8: 

- *Target 8.5: by 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.*

Possible Data Source

Related data is collected from FAO:
https://knoema.com/atlas/topics/Food-Security/Expenditures-Spent-on-Food/Expenditures-spent-on-food

Normalization

This indicator was normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (minimum value in the normalization formula) and the highest value represents the worst-case scenario (maximum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values. They are subject to change if the reference year is changed and were obtained from the above source:

Minimum: 0% representing best-case scenario with a score of 10.
Maximum 100% as the worst-case scenario with a score of 0.

Notes

AC3: Unemployment (%)

Full name

Unemployment rate (in per cent).

Definition or description

Unemployment rate represents the percentage of unemployed people in the labor force, which could be disaggregated by age and sex.

Method of measurement

Unemployment rate is calculated by dividing the number of unemployed people by the total number of people in the labor force. Labor force implying the total number of employed and unemployed persons within a determined age category.

Data can be obtained already computed.

Justification

The Unemployment rate is rising according to the ILO with the youth being disproportionately affected. Arab States have among the highest unemployment rates in the world, with huge gender gaps. The unemployment rate is a critical indicator as it provides the percentage of the Arab population without a steady source of income and who might have difficulty accessing food.

Link to SDGs

This indicator is related to many SDGs as follows:

SDG 1:

- *Target 1.1: By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day;*
- *Target 1.2: By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions;*
- *Target 1.5: By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.*

SDG 2:

- *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.*

SDG 8:

- *Target 8.10: Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all.*

Possible Data Source

Related data is collected from the World Bank:
https://data.worldbank.org/indicator/sl.uem.totl.zs

Normalization

This indicator was normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (minimum value in the normalization formula) and the highest value represents the worst-case scenario (maximum value in the normalization formula).

Given that extremely low or high minimums and maximums are detrimental to an economy, caps were used as follows: the minimum is set at 5% which is usually considered as full employment, while the maximum weighted Arab average of the natural unemployment rate between 1990-2017 and were obtained from the World Bank.

Minimum: 5% representing best-case scenario with a score of 10.
Maximum: 11.3% as the worst-case scenario with a score of 0.

Notes

AC4: Logistics (index)

Full name

Logistics performance index (as an index).

Definition or description

As per World Bank, Logistics Performance Index (LPI) overall score echoes insights of a country's logistics founded on efficiency of customs clearance process, quality of trade- and transport-related infrastructure, ease of arranging competitively priced shipments, quality of logistics services, ability to track and trace shipments, and frequency with which deliveries reach the consignee within the scheduled time. The index ranges from 1 to 5, with a higher score representing better performance.[26]

Method of measurement

Data from the Logistics Performance Index surveys are conducted by the World Bank in partnership with academic and international institutions, private companies and individuals engaged in international logistics. Respondents appraise eight economies on six main dimensions scaled from 1 (worst) to 5 (best). The economies are selected based on the most important export and import markets of the respondent's country. Scores for the six areas are averaged across all respondents and aggregated to a single score using principal components analysis.[27]

Justification

The LPI aims to assist countries to identify the challenges and opportunities faced in terms of their performance on logistics and supply chains, which are necessary to move the food around. It assists countries to adopt strategies to improve their performance. This indicator is related to food security as it looks at the quality of trade and transport related infrastructure, which determines access to food through port logistics, red tapes and roads infrastructure among others.

Link to SDGs

This indicator could be linked to several SDGs as follows::

SDG 1:

- *Target 1.4: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance.*

SDG 2: 

- *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;*
- *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.*

Possible data Source

Related data is collected from the World Bank:

https://data.worldbank.org/indicator/LP.LPI.OVRL.XQ?end=2016&name_desc=false&start=2010

Normalization

This indicator was normalized to scale from 0 to 10, meaning that the highest value represents the best-case scenario (maximum value in the normalization formula) and the lowest value represents the worst-case scenario (minimum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values. They are subject to change if the reference year is changed and were obtained from the World Bank:

Minimum: 1.3 as the worst-case scenario with a score of 0.
Maximum: 4.1 representing best-case scenario with a score of 10.

Notes

AC5: Inflation (%)

Full name

Inflation, consumer prices (in per cent).

Definition

Inflation is concerned with movements or changes in price levels of goods and services over a period of time within a country. It is commonly measured through the consumer price index as the percentage change of the price level of a basket of consumer goods and services commonly purchased by households over a given time period, e.g., monthly, quarterly or yearly. [28]

Method of measurement

The Laspeyres formula is used to estimate this indicator29. First, price indices are estimated by dividing current prices by those at the base period weighted by quantity. Consumer price indices are obtained through surveys and collected on a regular basis for a defined but representative basket of consumer goods and services. Second, the inflation is calculated by subtracting two CPIs to determine the change between two different time scales.

Data can be obtained already computed.

Justification

Substantial price variations may lead to shortages of goods and thus can affect people's ability to acquire the food they need.This is especially true for individuals or households spending a high share of their income on food. Excessively rising food prices may force poor households and individuals to forgo food despite that they might be feeling hungry or to opt for less nutritious cheaper foods. A decreased economic access can impact eating habits as well as frequency and stability of food supply; thus negatively affecting nutrition and food security levels.

Link to SDGs

This indicator is related to many SDGs as follows:

SDG 1:

- *Target 1.5: By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.*

SDG 2:

- *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;*
- *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.*

Possible data Source

Related data for this indicator is collected from the World Bank.
https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?end=2018&start=2010

Normalization

This indicator was normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (minimum value in the normalization formula) and the highest value represents the worst-case scenario (maximum value in the normalization formula).

A desirable inflation rate for a healthy economy is between 2-3% and as such 2% is used as a fixed minimum. Any high values of inflation are bad for the economy and since they can go indefinitely the maximum is capped at 20%, which is 3 points higher than the highest global inflation average of 17% recorded in 1974 as per the World Bank:

Minimum: 2% representing best-case scenario with a score of 10.
Maximum: 20% as the worst-case scenario with a score of 0.

Notes

Food Utilization indicators

UT1: Drinking water access (%)

Full name

Proportion of the population using at least basic drinking water services (in per cent).

Definition or description

This indicator encompasses both people using basic water services as well as those using safely managed water services. Basic drinking water services are described as drinking water from an improved source, provided collection time is not more than 30 minutes for a round trip. Improved water sources include piped water, boreholes or tube wells, protected dug wells, protected springs and packaged or delivered water.[30]

Method of measurement

Data on drinking water, sanitation and hygiene are produced by the Joint Monitoring Programme (JMP) of the World Health Organization (WHO) and United Nations Children's Fund (UNICEF) based on administrative sources, national censuses and nationally representative household surveys.[31]

Estimations begin with the identification of nationally representative data sources that contain information on the use of water and sanitation services and the availability of hand washing facilities in the home. For most countries this information is collected from households during interviews conducted by national statistical offices.[32] The aggregates are computed using a weighted population average and only if at least 65% of the data are available.

Data can be obtained already computed.

Justification

Access to clean and safely managed drinking water is a determinant of safe food production and consumption practices. As such, it plays a major role in food security as clean water prevents nutritional diseases and infections and therefore reduces the incidence of illnesses that can hinder the absorption of nutrients and debilitate the workforce particularly in rural areas. It is crucial to monitor this indicator in the Arab region, as the WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene for March 2018 showed that 51 million people in the Arab Region lacked a basic drinking water service in 2015, 73% of whom live in rural areas (WHO/UNICEF, 2018).[33]

Link to SDGs

This indicator is related to SDG 6:

- *Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all;*
- *Target 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.*

Possible data Source

Related data can be extracted from

JMP: https://washdata.org/data/household#!/

FAO: http://www.fao.org/faostat/en/?#data/FS or World Bank: https://data.worldbank.org/indicator/SH.H2O.BASW.ZS?end=2015&start=2010&view=chart
Normalization

This indicator was normalized to scale from 0 to 10, meaning that the highest value represents the best-case scenario (maximum value in the normalization formula, meaning that the whole population is using safely managed drinking water services) and the lowest value represents the worst-case scenario (minimum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values. They are subject to change if the reference year is changed and are extracted from JMP, FAOSTAT or the World Bank:

Minimum: 18.1% as the worst-case scenario with a score of 0.
Maximum: 100%representing best-case scenario with a score of 10.

Notes

UT2: Sanitation access (%)

Full name

Proportion of population using at least basic sanitation services (in per cent).

Definition or description

This indicator is defined as "The percentage of people using at least basic sanitation services", that is, improved sanitation facilities that are not shared with other households. This indicator encompasses both people using basic sanitation services as well as those using safely managed sanitation services. Improved sanitation facilities include flush/pour flush to piped sewer systems, septic tanks or pit latrines; ventilated improved pit latrines, compositing toilets or pit latrines with slabs.

Method of measurement

Data on drinking water, sanitation and hygiene are produced by the Joint Monitoring Programme of the World Health Organization (WHO) and United Nations Children's Fund (UNICEF) based on administrative sources, national censuses and nationally representative household surveys.[34]

Estimations begin with the identification of nationally representative data sources that contain information on the use of water and sanitation services and the availability of handwashing facilities in the home. For most countries this information is collected from households during interviews conducted by national statistical offices.[35]

National, regional and income group estimates are made when data are available for at least 50 percent of the population.[36]

Data can be obtained already computed.

Justification

Access to sanitation facilities prevents the spreading of diseases and the contamination of water resources. It is part of food security as it promotes healthier life and improves the assimilation of nutrients allowing for a higher productive life and reduced health costs among other, which support economic development. It is relevant to the Arab region, as the WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene for March 2018 showed that 74 million people in the Arab Region lacked a basic sanitation service in 2015, 25 million of whom practice open defecation (WHO/UNICEF, 2018).

Link to SDGs

This indicator is related to SDG 6:

- *Target 6.2 "By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations".*

Possible data Source

Related data can be extracted from

JMP: https://washdata.org/data/household#!/
FAO: http://www.fao.org/faostat/en/?#data/FS
or World Bank: https://data.worldbank.org/indicator/SH.STA.BASS.ZS?end=2015&start=2010&view=chart

Normalization

This indicator was normalized to scale from 0 to 10, meaning that the highest value represents the best-case scenario (maximum value in the normalization formula, meaning that the whole population is using safely managed sanitation services) and the lowest value represents the worst-case scenario (minimum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values. They are subject to change if the reference year is changed and are obtained from JMP, FAOSTAT or the World Bank:

Minimum: 5.7% as the worst-case scenario with a score of 0.
Maximum: 100% representing best-case scenario with a score of 10.

Notes

UT3: Child stunting (%)

Full name

Percentage of children under 5 years of age affected by stunting (in per cent).

Definition or description

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.[37]

Method of measurement

Stunting is measured as the (number of children aged 0-5 years that fall below minus two standard deviations from the median height-for-age of the WHO Child Growth Standards / total number of children aged 0-5 years that were measured) * 100.[38]

$$\frac{\text{Number of Children with height below median by 2 standard deviations}}{\text{Total number of children measured}} \times 100$$

Children's weight and height are measured using standard technology, e.g. children less than 24 months are measured lying down, while standing height is measured for children 24 months and older. The data sources include national nutrition surveys, any other nationally representative population-based surveys with nutrition modules and national surveillance systems.

Data can be obtained already computed.

Justification

Stunting is a major health issue as it is due to poor diets and affected children tend to face recurrent infections and possibly death. The percentage of children with low height-for-age result from cumulative effects of under-nutrition and infections from birth or even before. Thus, it is as well a measure of poor environmental conditions and/or long-term restriction of a child's growth potential. This indicator is relevant to the Arab region due to the protracted crises (ESCWA, 2017).[39]

Link to SDGs

This indicator is related to SDG 2:

- *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.*

Possible data Source

Related data can be extracted from:

WHO: https://www.who.int/nutgrowthdb/estimates2018/en/
FAO: http://www.fao.org/faostat/en/?#data/FS
or World Bank: https://data.worldbank.org/indicator/SH.STA.STNT.ZS?end=2017&start=2010&view=chart

Normalization

This indicator was normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (minimum value in the normalization formula) and the highest value represents the worst-case scenario (maximum value in the normalization formula).

Caps were used corresponding to a minimum of 2.5% below, which stunting is considered insignificant and a maximum set at 12.2%, which is the 2030 global target as reported in the State of Food Security and Nutrition in the World 2019:

Minimum: 2.5% representing best-case scenario with a score of 10.
Maximum: 12.2% as the worst-case scenario with a score of 0.
Maximum: 12.2% as the worst-case scenario with a score of 0. (SOFI 2019, page 29)

Notes

UT4: Child wasting (%)

Full name

Percentage of children under 5 years of age affected by wasting (in per cent).

Definition or description

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.[40]

Method of measurement

Wasting is measured the number of children aged 0-5 years that fall below minus two standard deviations from the median weight-for-height of the WHO Child Growth Standards / total number of children aged 0-5 years that were measured) * 100.

$$\frac{\text{Number of Children with weight-for-height below median by 2 standard deviations}}{\text{Total number of children measured}} \times 100$$

Children's weight and height are measured using standard techniques, e.g. children less than 24 months are measured lying down, while standing height is measured for children 24 months and older. The data sources include national nutrition surveys, any other nationally representative population-based surveys with nutrition modules and national surveillance systems.

Data can be obtained already computed.

Justification

Wasting is a major health issue due to the risk of morbidity. Affected children are more subject to diseases that could devolve into death when the weight loss is too much body height. The frequency of illnesses further affects their nutritional status, which locks them into a vicious cycle (UNICEF, childinfo.org).[41] This indicator is of particular relevance to the Arab region in light of the protracted crises.

Link to SDGs

This indicator is related to SDG 2:

- *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.*

Possible data Source

Related data can be extracted from:

WHO: https://www.who.int/nutgrowthdb/estimates2018/en/
FAO: http://www.fao.org/faostat/en/?#data/FS
or World Bank: https://data.worldbank.org/indicator/SH.STA.WAST.ZS?end=2017&start=2010&view=chart

Normalization

This indicator was normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (minimum value in the normalization formula) and the highest value represents the worst-case scenario (maximum value in the normalization formula).

Caps were used corresponding to a global minimum of 0% and a global maximum of 3% corresponding to the 2030 global target reported in the State of Food Security and Nutrition in the World 2019:

Minimum: 0% representing best-case scenario with a score of 10.
Maximum: 3% as the worst-case scenario with a score of 0.

Notes

UT5: Women anaemia (%)

Full name

Prevalence of anaemia among women of reproductive age (15-49 years) (in per cent).

Definition or description

Prevalence of anemia among women of reproductive age refers to the combined prevalence of both non-pregnant with haemoglobin levels below 12 g/dL and pregnant women with haemoglobin levels below 11 g/dL.[42]

Method of measurement

It consists of the weighted average of both non-pregnant women with haemoglobin levels below 12 g/dL and pregnant women with haemoglobin levels below 11 g/dL.

Data can be obtained already computed.

Justification

Anaemia is a serious public health issue, given its impact on psychological and physical development, behavior and work performance. It is the most common nutritional disorder in the world (Verster and van der Pols, 1995).43This is a gender specific indicator as it reflects women's health and access to nutritious food and is crucial to their reproductive capacities. Increased prevalence of anaemia among women of reproductive age indicates inadequate intake of micronutrients, hence, anaemia is representative of the food security situation.

Link to SDGs

This indicator is related to SDG 2 and SDG 3 as micronutrient deficiencies occur from poor food diversity resulting in poor health and pregnancy status.

Possible data Source

Related data can be extracted from

FAO: http://www.fao.org/faostat/en/?#data/FS
or World Bank: https://data.worldbank.org/indicator/SH.ANM.ALLW.ZS?end=2016&start=2010

Normalization

This indicator was normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (minimum value in the normalization formula) and the highest value represents the worst-case scenario (maximum value in the normalization formula).

Caps were used corresponding to a global minimum of 2.5% below which is considered insignificant and the global maximum of 15.2% corresponding to the 2030 global target as reported in the State of Food Security and Nutrition in the World 2019:

Minimum: 2.5% representing best-case scenario with a score of 10.
Maximum: 15.2% as the worst-case scenario with a score of 0.

Notes

Stability indicators

ST1: Climate change (index)

Full name

Climate change vulnerability index (as an index).

Definition or description

The climate change vulnerability index attempts to assess the vulnerability of a country against the effects of climate change as proxied through three major impacts: weather related disasters; sea level rise and loss of agriculture productivity. It reflects the relative standing of countries.

Method of measurement

This indicator was selected among others, to monitor the stability of food security in the Arab region as climate change can have major impact on agriculture productivity, thus implying its food availability, but can as well impact the stability of food supply within and between Arab countries.

Data can be obtained already computed.

Justification

This indicator was selected as climate change can have major impact on food security, by affecting agriculture production and productivity, thus affecting food availability, but it could affect also the food supply system within and between countries.

Link to SDGs

This indicator is related to many SDGs as follows:

SDG 12: 

- *Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources.*

SDG 13: 

- *Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.*

SDG 15: 

- *Target 15.3: By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.*

Possible data Source

Related data is available on http://projects.hcss.nl/monitor/70/.

Normalization

This indicator was normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (minimum value in the normalization formula) and the highest value represents the worst-case scenario (maximum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values. They can be subject to change if the reference year is changed and were extracted from the above-provided source:

Minimum: 0 representing best-case scenario with a score of 10.
Maximum: 0.5 as the worst-case scenario with a score of 0.

Notes

ST2: Price anomalies (index)

Full name

Food price anomalies (as an index).

Definition or description

The indicator for food price anomalies measures the number of "Price Anomalies" that happen on a given food commodity price series over a certain period of time.44

Method of measurement

The indicator of food price anomalies IFPA is calculated using weighted means of quarterly and annual compound growth rates and weighted standard deviations of the quarterly and annual compound growth rates.

Data can be obtained already computed.

Justification

Food price anomalies allows the evaluation of changes in prices over a determined period, month or year, while taking into account prevailing seasonality in food markets and inflation so as to detect abnormal price changes over the selected period. As such, it ensures the proper functioning of the food market, as well as facilitating access to information on markets, including food reserves that could help limit extreme food price volatility that could lead to a heightened state of food insecurity.

Link to SDGs

This indicator is related to SDG 2:

- *Target 2.c: To 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.*

Possible Data Source

Related data for this indicator is collected from FAO or UNSTAT:
https://unstats.un.org/sdgs/indicators/database/?indicator=2.c.1.

Normalization

This indicator was normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (minimum value in the normalization formula) and the highest value represents the worst-case scenario (maximum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values. They are subject to change if the reference year is changed and were extracted from either FAOSTAT or UNSTAT:

Minimum: -1.7 representing best-case scenario with a score of 10.
Maximum: 1.9 as the worst-case scenario with a score of 0.

Notes

ST3: Political stability (ranking)

Full name

Political stability and absence of violence (as a ranking).

Definition or description

Political stability and absence of violence provide insights on the likelihood that the social life will be destabilized, or the government overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.[45]

Method of measurement

The perceptions of the likelihood of political instability and/or violence is measured by Worldwide Governance Indicators by looking at a list of individual variables from different data source such as armed conflict, violent demonstrations, social unrest and international tensions etc. A ranking of countries and then made based on the likelihood of increased violence.

Data can be obtained already computed.

Justification

A high level of political instability and violence indicates the likelihood of further unrests and a lack of a conducive environment for economic growth and development. In countries affected, there is usually a high level of food insecurity and in the Arab region countries experiencing famine and severe food insecurity are also affected by war and conflicts.

Link to SDGs

This indicator can be linked to various SDGs such as:

SDG 1:

- *Target 1.5: By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.*

SDG 2:

- *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.*

Possible Data Source

Related data on this indicator is collected from the World Bank:
https://databank.worldbank.org/source/worldwide-governance-indicators

Normalization

This indicator was normalized to scale from 0 to 10, meaning that the highest value represents the best-case scenario (used as maximum value in the normalization formula, meaning the higher the political stability and absence of violence the better the situation is) and the lowest value represents the worst-case scenario (minimum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values. They are subject to change if the reference year is changed and were extracted from the World Bank:

Minimum: 0% as the worst-case scenario with a score of 0.
Maximum: 100 %representing best-case scenario with a score of 10.

Notes

ST4: Production variability (1,000$/capita)

Full name

Per capita food production variability (in thousand dollars per capita).

Definition or description

This indicator, as per FAO, corresponds to the variability of the "food net per capita production value in thousands of constant 2004-2006 international $". This indicator compares the variations of the per capita food production across countries and time.

Method of measurement

As mentioned by the FAO, missing values in the food net per capita production value are interpolated using a linear trend. The series is then detrended by fitting a cubic spline by ordinary least squares to the series. The difference between the cubic fit and the actual values are then calculated. Lastly, the volatility for a specific year is defined as the standard deviation of these differences over the previous five years. The aggregates are computed applying the same methodology to the aggregates of the per capita food production variable.

Data can be obtained already computed.

Justification

The indicator helps identify the vagaries prevailing in local food markets. As such, it is an important aspect of food security as with high levels of food production and productivity variability there is a higher likelihood that the population will have difficulty accessing affordable food sourced locally.

Link to SDGs

This indicator is related to SDG 2:

- *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;*
- *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;*

- *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.*

Possible Data Source

Related data for this indicator was collected from FAOSTAT:
http://www.fao.org/faostat/en/#data/FS
http://www.fao.org/economic/ess/ess-fs/ess-fadata/en/#.XbskEOhKiHs

Normalization

This indicator was normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (used as minimum value in the normalization formula) and the highest value represents the worst-case scenario (used as a maximum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values. They are subject to change if the reference year is changed and were extracted from FAOSTAT:

Minimum: 0.5 representing best-case scenario with a score of 10.
Maximum: 80.1 as the worst-case scenario with a score of 0.

Notes

ST5: Supply variability (kcal/capita/day)

Full name

Per capita food supply variability (in kilocalories per capita per day).

Definition

This indicator, as per FAO, corresponds to the variability of the "food supply in kcal/capita/day". This indicator uses data on dietary energy supply from the Food Balance Sheet (FBS) to estimate annual fluctuations in the per capita food supply (kcal), measured as the standard deviation over the previous five years per capita food supply. Variability in food supply is a result of instability in supply, trade, consumption and storage, in addition to changes in government policies such as trade restrictions, taxes and subsidies, stockholding and public distribution.[46]

Method of measurement

As mentioned by FAO, missing values in the dietary energy supply are interpolated using a linear trend. The series is then detrended by fitting a cubic spline by ordinary least squares to the series. The difference between the cubic fit and the actual values are then calculated. Lastly, the volatility for a specific year is defined as the standard deviation of these differences over the previous five years. The aggregates are computed applying the same methodology to the aggregates of the food supply variable.

Data can be obtained already computed.

Justification

This indicator assesses the variability prevailing in the food supply system, which affects the ability of people, particularly the most vulnerable, to access enough food. Assessing food supply variability allows a better understanding of the cycles prevailing in the food system, which usually correlates with price volatility and allows policy makers to adopt measures to enhance resilience notably against price shocks. This indicator will be a measure of how stable and reliable the food supply is within the country including its evolution overtime.

Link to SDGs

This indicator is related to SDG 2:

- *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;*

- *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;*
- *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;*
- *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;*

Possible Data Source

Related data for this indicator was collected from FAOSTAT:

http://www.fao.org/faostat/en/#data/FS
http://www.fao.org/economic/ess/ess-fs/ess-fadata/en/#.XbskEOhKiHs

Normalization

This indicator was normalized to scale from 0 to 10 as a reversed indicator, meaning that the lowest value represents the best-case scenario (used as minimum value in the normalization formula) and the highest value represents the worst-case scenario (used as a maximum value in the normalization formula).

Currently figures of the reference year 2010 were used to assign the global minimum and maximum values. They are subject to change if the reference year is changed and were extracted from FAOSTAT:

Minimum: 4 representing best-case scenario with a score of 10.
Maximum: 120 as the worst-case scenario with a score of 0.

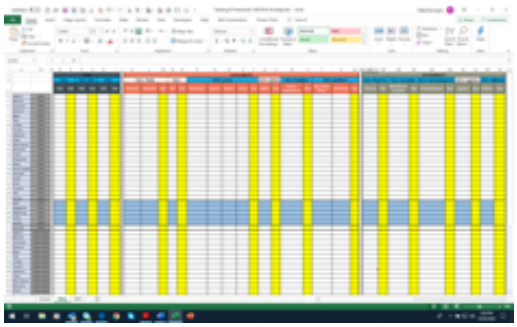
Notes

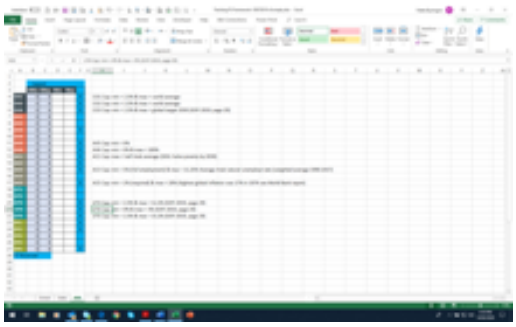
Using the framework's Excel file: Steps

1. Ensure to use one of the latest versions of Excel (2010 or above)

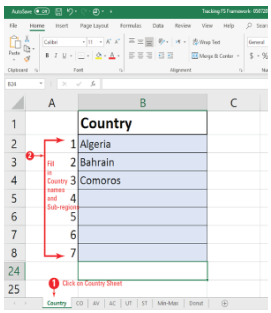
2. Input the data

Note: Some versions might use a single data sheet (newer version) rather than multiple data sheets (CO. AV. AC, etc.) for the earlier versions. Examples for both are provided below.



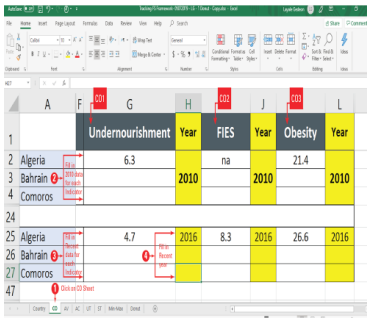


Input data into the "Data" and "MM" sheets only. Data should be input into the white cells (no colors). Names of countries and regions could also be changed. Note that the cells under region colored in light blue on the "Data" sheet are automatically generated as averages. However, please consult before updating these.



1. Click on the Country sheet
2. Fill in the Country names and/or Sub-regions

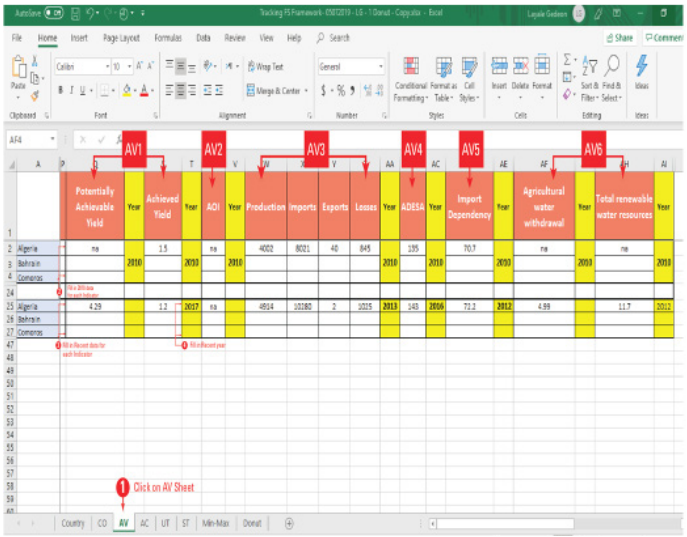
1. اضغط على ورقة "Country"
2. إملأ اسم الدولة و/أو المناطق الفرعية



1. Click on the CO sheet
2. Fill in the 2010 values for CO1,CO2&CO3 (2010 base year)
3. Fill in recent values for each indicator
4. fill in the year of the recent value

1. اضغط على ورقة "CO"
2. إملأ الأرقام والسنة التابعة لكل مؤشر

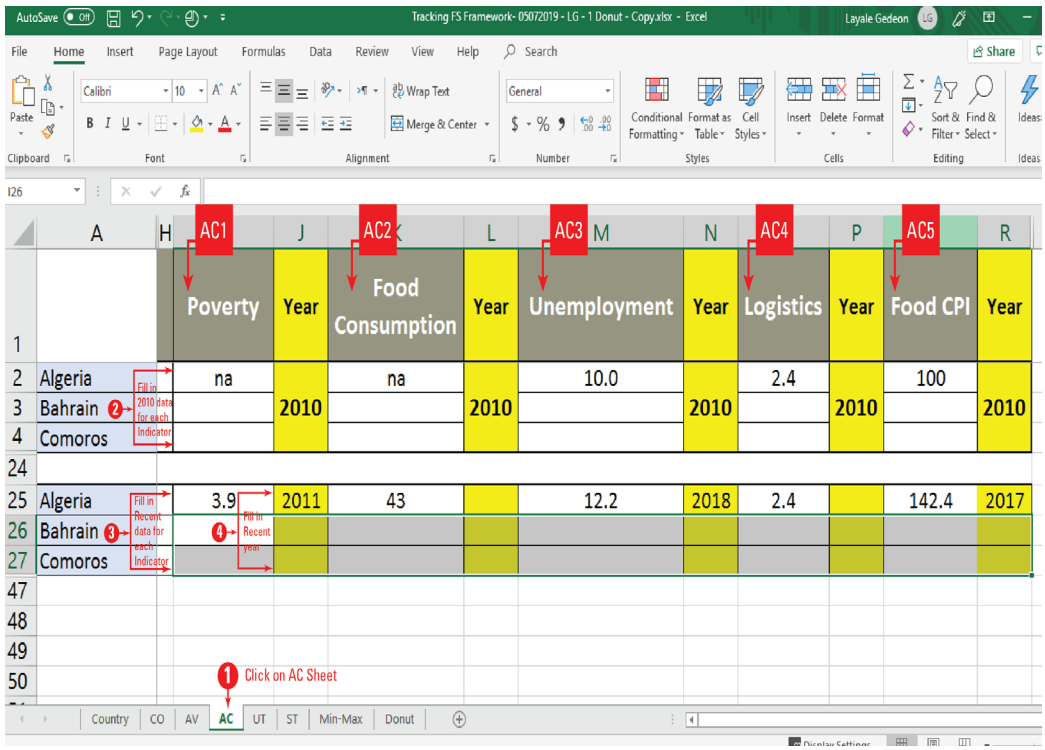
Make sure when no data is available to write: na (insmall letters)

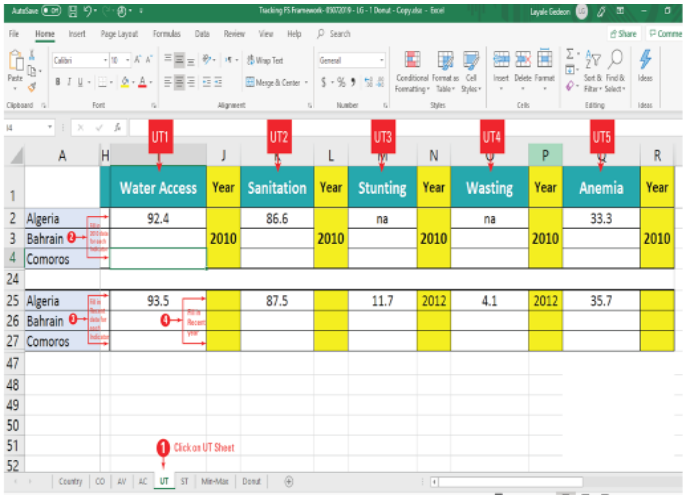


1. Click on the AV sheet
2. Fill in the 2010 values for all indicators (2010 base year)
3. Fill in recent values for each indicator
4. fill in the year of the recent value

1. اضغط على ورقة "AV"
2. إملأ الأرقام والسنة التابعة لكل مؤشر

Make sure when no data is available to write: na (insmall letters)

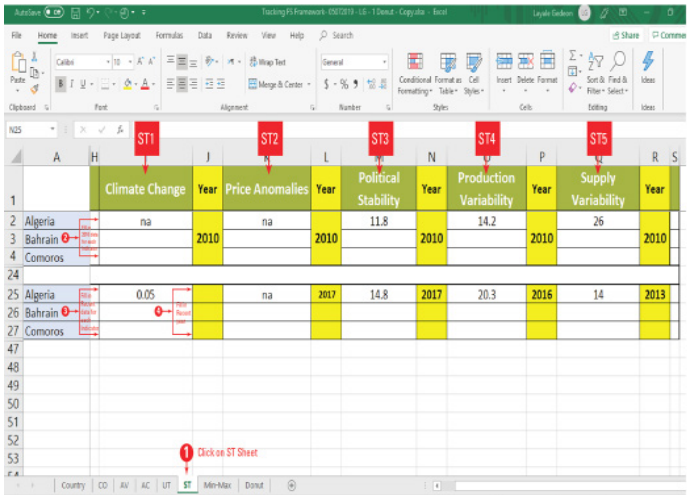




1. Click on the UT sheet
2. Fill in the 2010 values for all indicators
(2010 base year)
3. Fill in recent values for each indicator
4. fill in the year of the recent value

1. اضغط على ورقة "UT"
2. إملأ الأرقام والسنة التابعة لكل مؤشر

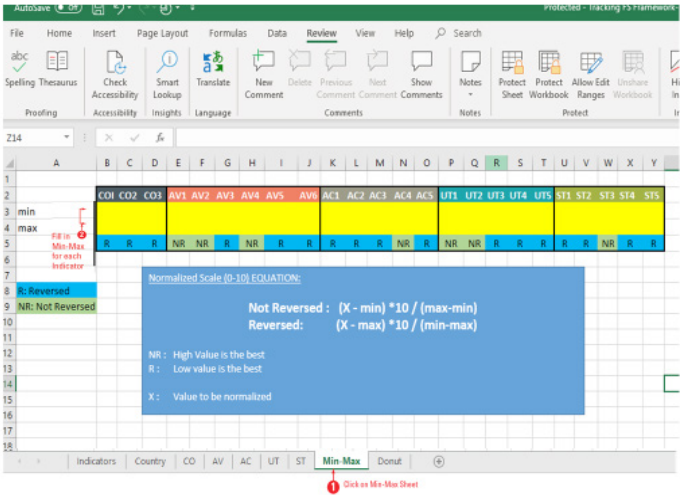
Make sure when no data is available to write:
na (insmall letters)



1. Click on the ST sheet
2. Fill in the 2010 values for all indicators
(2010 base year)
3. Fill in recent values for each indicator
4. fill in the year of the recent value

1. اضغط على ورقة "ST"
2. إملأ الأرقام والسنة التابعة لكل مؤشر

Make sure when no data is available to write:
na (insmall letters)



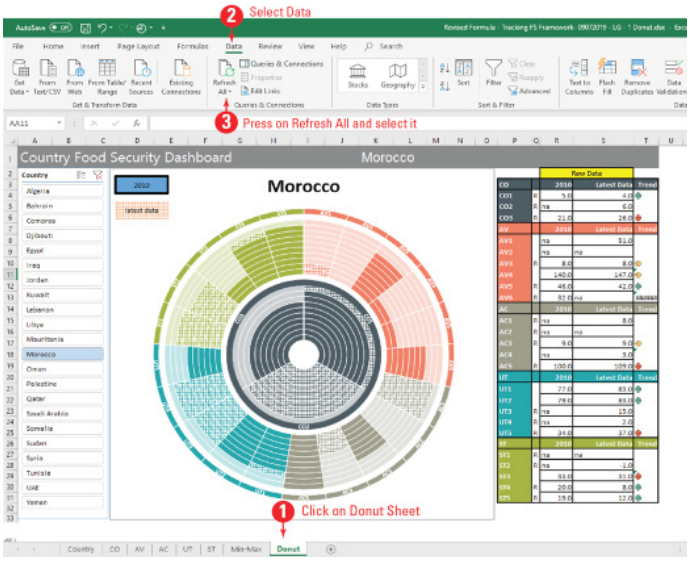
1. Click on the Min-Max sheet
2. Fill in the minimum and maximum values for all indicators year 2010 (selected base year)

1. اضغط على ورقة "Mln-Max"
2. إملأ الحد الزدنى والحد الزقصى لكل المؤشرات التابعة لسنة 2010

3. Generate the doughnut and table

Once the data is refreshed by selecting the "Data" tab and choosing "Refresh All" the doughnuts are automatically generated on the "Donut" sheet. By toggling with the Slicer, the user can select which country to display.

Single Sheet File:



1. Click on the Conut sheet
2. Select Data
3. Click ono Refresh All and Select it

1. اضغط على ورقة "Donut"
2. اضغط على بيانات
3. اضغط على تحديث الكل

With this file, the user is given the option to highlight performance using selected icons (sunny, cloudy or stormy day respectively for good (score 8 and above), moderate (score below 8 to 5) and poor performance (below 5). However, these are moved around manually.

Endnotes

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9. ESCWA (2017). Arab Horizon 2030: Prospects for enhancing food security in the Arab region. United Nations, New York
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23. https://data.worldbank.org/indicator/SI.POV.LMIC?end=2013&locations=1W&start=1981&view=chart
24. www.fao.org/fileadmin/templates/ess/documents/food.../ShareOfFood_en.xls
25. https://inddex.nutrition.tufts.edu/data4diets/indicator/household-food-expenditure-share
26. https://www.indexmundi.com/facts/indicators/LP.LPI.OVRL.XQ
27. https://datacatalog.worldbank.org/logistics-performance-index-ability-track-and-trace-consignments-1low-5high
28. https://databank.worldbank.org/reports.aspx?source=2&type=metadata&series=FP.CPI.TOTL.ZG.
29. https://www.stat.go.jp/english/data/cpi/1587.html
30. http://data.worldbank.org/indicator/SH.H2O.BASW.ZS.
31. https://databank.worldbank.org/reports.aspx?source=2&type=metadata&series=SH.H2O.BASW.ZS
32. https://washdata.org/monitoring/methods
33. https://www.unescwa.org/sites/www.unescwa.org/files/events/files/jmp_arab_region_snapshot_20march2018_0.pdf
34. https://data.worldbank.org/indicator/SH.STA.BASS.ZS
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