Food and Agriculture Organization of the United Nations

IFAD International Fund for Agricultural Development

unicef

WFP World Food Programme

World Health Organization

2024

SUPPLEMENTARY MATERIAL

THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD

FINANCING TO END HUNGER, FOOD INSECURITY AND MALNUTRITION IN ALL ITS FORMS

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The main report *The State of Food Security and Nutrition in the World 2024* is available at: https://doi.org/10.4060/cd1254en

SUPPLEMENTARY MATERIAL TO CHAPTER 2

S2.1 Methodology for estimating the prevalence of undernourishment for 2020 to 2023

As is always the case in this report, the prevalence of undernourishment (PoU) and the number of undernourished people (NoU) referring to the most recent years are nowcasted due to lack of direct information on the most recent values of each of the elements that contribute to their computation; in other words, they are predictions of the very recent past.

As already noted in the last two years' editions of this report, 2020, 2021 and – to a lesser extent – 2022 were unique in many respects due to the COVID-19 pandemic and its lingering effects. This demanded special considerations when nowcasting the values of the PoU, especially with respect to estimating the likely change in the coefficient of variation (CV), considering the very special conditions under which food systems operated during the pandemic.

The strategy used to project values of the CV|y from 2019 to 2022 was based on assumptions regarding the way in which inequality in access to food contributes to rates of undernourishment, as fully described in last year's edition of the report. This was not changed this year; however, as the world slowly returned to more normal conditions, the operation of household surveys was resumed in many countries. As a result, microdata from household surveys conducted after 2020 in nine countries became available to the Food and Agriculture Organization of the United Nations (FAO), which allowed for a reassessment of the values of the CV that had previously been modelled. Moreover, to nowcast the CV|y in 2023, the way in which inequality in access to food may have contributed to the levels of food consumption and undernourishment was reconsidered to reflect the gradual reversion towards normal estimation procedures.

One consequence of this is that the extent of uncertainty surrounding the estimates of PoU and NoU in 2021 and 2022 decreased, and the one remaining around the estimates for 2023 is considerably smaller compared to the years immediately following the COVID-19 pandemic.

Table S2.1 presents the lower and upper bounds of the PoU in 2022 and 2023 at the global, regional and subregional levels.

S2.2 Methodology for projections of prevalence of undernourishment to 2030

To project PoU values to 2030, the three fundamental variables that enter in the PoU formula (dietary energy consumption [DEC], CV and minimum dietary energy requirement [MDER]) are projected separately, based on different inputs, depending on the scenario considered.

The main source of information is the output of the MIRAGRODEP recursive, dynamic computable general equilibrium model, which provides series of projected values, at the country level, for:

- real per capita gross domestic product (GDP) (GDP_Vol_pc);
- income Gini coefficient (gini_income);
- an index of real food prices (Prices_Real_Food);
- extreme poverty headcount rate (that is, the percentage of the population with real daily income below USD 2.15 (x215_ALL); and
- daily per capita dietary energy supply (DES_Kcal).

The MIRAGRODEP model was calibrated to the pre-pandemic situation of the world economy in 2019 and was used to generate projections of macroeconomic fundamentals into 2020–2030 under two scenarios: i) "before COVID-19", which aims to capture the implications for food availability and access (and therefore the PoU) of the world economic prospects as seen before the eruption of the pandemic by the International Monetary Fund (IMF) *World Economic Outlook* published in October 2019; and ii) "current prospects", which is based on the latest World Economic Outlook published in April 2024.[1] A more detailed description of the MIRAGRODEP model, as well as the assumptions used to build the various scenarios, can be found in Laborde and Torero (2023).[2]

TABLE S2.1 RANGES OF PREVALENCE OF UNDERNOURISHMENT AND NUMBER OF UNDERNOURISHED NOWCASTED IN 2022 AND 2023

	2022				2023			
	PoU		NoU		PoU		NoU	
	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound
	(%)		(millions)		(%)		(millions)	
WORLD	**8.7**	**9.6**	**694.7**	**763.4**	**8.9**	**9.4**	**713.3**	**757.2**
AFRICA	**19.3**	**21.6**	**274.8**	**307.7**	**19.7**	**21.2**	**287.7**	**309.7**
Northern Africa	7.1	8.9	18.4	23.0	7.4	8.6	19.6	22.7
Sub-Saharan Africa	22.0	24.4	256.4	287.4	22.4	24.0	268.1	287.0
Eastern Africa	27.8	30.3	131.3	143.3	26.9	29.0	130.7	140.5
Middle Africa	27.6	31.3	54.1	61.3	30.5	31.3	61.7	63.2
Southern Africa	9.4	10.1	6.4	6.9	9.4	9.7	6.5	6.7
Western Africa	15.1	17.0	24.7	73.1	15.7	17.4	69.2	76.6
ASIA	**7.9**	**8.4**	**372.3**	**395.7**	**8.0**	**8.3**	**380.4**	**393.3**
Central Asia	2.8	3.5	2.2	2.7	2.7	3.0	2.1	2.4
Eastern Asia	<2.5	<2.5	n.r.	n.r.	<2.5	<2.5	n.r.	n.r.
South-eastern Asia	5.8	6.5	39.7	44.1	6.1	6.3	41.6	43.6
Southern Asia	13.7	14.3	275.3	287.3	13.8	14.1	279.5	285.8
Western Asia	11.5	13.2	33.8	38.7	11.7	12.9	35.0	38.3
LATIN AMERICA AND THE CARIBBEAN	**5.9**	**7.5**	**38.7**	**49.7**	**5.4**	**6.6**	**36.1**	**43.7**
Caribbean	17.3	19.0	7.7	8.4	18.2	18.9	8.1	8.4
Latin America	5.0	6.7	31.1	41.3	4.5	5.7	28.0	35.3
Central America	5.5	6.1	9.8	10.9	5.3	5.9	9.6	10.7
South America	4.9	7.0	21.3	30.4	4.2	5.6	18.4	24.6
OCEANIA	**6.9**	**7.4**	**7.1**	**3.4**	**7.3**	**7.6**	**3.3**	**3.4**
NORTHERN AMERICA AND EUROPE	**<2.5**	**<2.5**	**n.r.**	**n.r.**	**<2.5**	**<2.5**	**n.r.**	**n.r.**

NOTES: PoU = prevalence of undernourished; NoU = number of undernourished; n.r. = not reported, as the prevalence is less than 2.5 percent. For NoU, regional totals may differ from the sum of subregions, due to rounding and non-reported values. For country compositions of each regional/subregional aggregate, see Notes on geographic regions in statistical tables at the end of the main report.
SOURCE: Authors' (FAO) own elaboration.

In addition, we use the median variant projections of total population (both sexes), its composition by gender and age, and the crude birth rate as provided by the 2022 revision of the United Nations Department of Economic and Social Affairs *World Population Prospects*.[3]

Projections of dietary energy consumption

To project the series of *DEC* we use the following formula:

$$DEC_t = DES_T \times \frac{\widehat{DES\_Kcal_t}}{\widehat{DES\_Kcal_T}} \times (1 - WASTE_t), \forall t > T$$

where T = 2019 for "before COVID-19", and T = 2023 for "current prospects".

In other words, we take the model-projected series of DES_Kcal and adjust its level so that the value for year T matches the actual value. (This is necessary as the MIRAGRODEP model has been calibrated to an older Food Balance Sheet [FBS] series.)

Projections of the minimum dietary energy requirement

To project the MDER, we simply compute it based on the data on the composition of the population

by sex and age as projected by the 2022 *World Population Prospects*[4] (medium variant).

Projections of the coefficient of variation

As explained in the methodological note on the PoU in **Annex 1B** of the main report, the total CV is computed as $CV = \sqrt{(CV|y)^2 + (CV|r)^2}$, where the two components refer to variability in the per capita habitual dietary energy consumption due to differences across households in terms of income level and variability across individuals based on differences in sex, age, body mass and physical activity level. The projected values for CV in 2025 and 2030 are obtained by applying the formula above to the $CV|r$ and $CV|y$ projected separately. Projected $CV|r$ is computed based on the projected population structures by sex and age as provided by the *World Population Prospects* (similarly to what we do for the MDER), while the projected $CV|y$ is computed as a linear combination of relevant projected macroeconomic and demographic variables as follows:

$$\widehat{CV|y}_t = \alpha + \beta_1 GDP\_vol\_pc_t + \beta_2\, gini\_income_t + \beta_3\, x215\_ALL_t + \beta_4\, Prices\_Real\_Food_t + \beta_5\, cbr_t + \beta_6\, pop_t$$

Table S2.2 reports the estimated regression coefficients.

The series of $CV|y$ values predicted by the formula separately for each country for the years $T + 1$ to 2030 is then calibrated to the value for year T, similarly to what is done for the *DES*:

$$CV|y_t = CV|y_T \times \left(\frac{\widehat{CV|y_t}}{\widehat{CV|y_T}}\right), \forall t > T$$

where T = 2019 for "before COVID-19", and T = 2022 for "current prospects".

S2.3 Methodology for the analysis of food insecurity by degree of urbanization and by gender

The prevalence of food insecurity can be disaggregated by respondent/household characteristics when the data are collected directly from individual respondents in nationally representative samples. In **Chapter 2** of the main report, food insecurity estimates are presented disaggregated by sex of the respondent (adult men or women) and by Degree of Urbanization (DEGURBA) (i.e. urban, peri-urban or rural residency).

The methodology to disaggregate the indicator by any individual or household characteristic is as follows:

TABLE S2.2 ESTIMATED COEFFICIENTS FROM A REGRESSION OF HISTORICAL CV|Y VALUES ON A SET OF COVARIATES, 2000–2018

Regressors	Variable used to project	Regression model coefficients (standard error in parentheses)
Real GDP per capita	GDP_vol_pc	–0.2572 (0.0994)
Income Gini coefficient	gini_income	0.3286 (0.1210)
Poverty headcount	X215_ALL	0.0904 (0.1205)
Real food CPI	Prices_Real_Food	0.0786 (0.0700)
Crude birth rate	cbr	0.5634 (0.1552)
Total population	pop	–0.2557 (0.0539)
Constant		–0.0102 (0.0997)
N		75
r^2		0.5845
r^2_between		0.5877

NOTE: CPI = consumer price index; CV = coefficient of variation; GDP = gross domestic product.
SOURCE: Authors' (FAO) own elaboration.

- The cross-country comparable probability of food insecurity for each respondent is computed at two levels of severity: moderate or severe, and severe only. The probabilities are aggregated for each category of the characteristic of interest, by computing the weighted average (using sampling weights) across all respondents in that category, obtaining the prevalence of food insecurity within that group (e.g. among female respondents).
- The prevalence of food insecurity in a given category is weighted by the corresponding population (e.g. the number of female adults in the country) to obtain the subregional/regional/global estimate (e.g. the prevalence of food insecurity in the female adult population in Northern Africa), if reliable population data are available and if there is sufficient geographical coverage (at least 50 percent) in terms of percentage of the population.

The computation of the prevalence of food insecurity by sex is possible because data are collected from individual respondents (adults aged 15 years or older) by FAO via data collection service providers (see **Annex 1B** of the main report). For countries for which national government survey data are used to calculate the prevalence estimates of food insecurity (see **Annex 1B** of the main report), it is generally not possible to disaggregate the indicator by sex, as data are collected at the household level. Thus, in such cases, the same relative difference by sex estimated based on data collected by FAO is applied to the prevalence of food insecurity in the total population based on national data. This is an approximation, as the difference in the FAO data applies to adult respondents, and not to the whole population. However, the benefit is that the statistics by sex are consistent in terms of levels and trends with those of the overall population.

The disaggregation by DEGURBA is possible because Gallup© began to georeference each interview in countries collected using face-to-face mode in 2021. Since 2022, countries covered by telephone interviews were also georeferenced, providing enough geographical representation to produce subregional, regional and global food insecurity estimates by DEGURBA.

Within each country, it is possible to link each georeferenced observation to the DEGURBA dataset, defining whether the observation (respondent) is located in a city, town or rural area, based on population density and size, according to internationally comparable criteria developed by the Statistical Office of the European Union (EUROSTAT), the International Labour Organization (ILO), FAO, the Organisation for Economic Co-operation and Development (OECD), the United Nations Human Settlements Programme (UN-Habitat) and the World Bank and approved at the 51st session of the United Nations Statistical Commission in March 2020.[5] The prevalence of food insecurity is computed for each category of urbanization and then aggregated at the subregional, regional and global level using the 2020 updated DEGURBA population distribution published by EUROSTAT.[6] For countries where official food insecurity statistics are informed by national data, the same approximation method described for the disaggregation by sex is applied.

As no Food Insecurity Experience Scale (FIES) data were collected by FAO in China in 2022 and 2023, and the data collected in 2021 were not georeferenced, the estimates of food insecurity by DEGURBA in China were approximated as follows: the prevalence of food insecurity for 2021 was disaggregated by area of residence as defined in the Gallup© World Poll (GWP), where respondents report if they live in: a rural area or on a farm; a small town or village; or a large city or the suburb of a large city. Then, these categories were mapped to DEGURBA by considering people living in a rural area or on a farm as part of the "rural" population, those living in a small town or village as part of the "peri-urban" population, and those living in a large city or the suburb of a large city as "urban" residents. This mapping was justified with the rationale that DEGURBA classifies areas with increasing urbanization based on population density and size. To ensure that no significant bias was induced by this approach, the same mapping was validated as accurate for other Asian countries where data were collected in 2022.

S2.4 Methodology for the analysis in Box 3 of the main report: Is food insecurity associated with the properties of a healthy diet? Preliminary analysis from 28 countries

The objective of the analysis presented in Box 3 of the main report was to examine the association between food insecurity severity and selected properties of a healthy diet, using food insecurity and dietary data collected from the same respondents in 28 countries between 2021 and 2022.

Datasets

The food insecurity data was collected using the FIES survey module (individual-referenced module with a one-year reference period). Food security data have been collected annually by FAO using the FIES survey module since 2014 through the GWP. The dietary data were collected using the Diet Quality Questionnaire (DQQ), developed by the Global Diet Quality Project, a collaborative effort of Gallup©, Harvard University and the Global Alliance for Improved Nutrition.[7] The DQQ gathers data on intake of 29 food groups using a sentinel foods list. Beginning in 2021, the DQQ has been included in the GWP in a growing number of countries.

Only countries and data collection rounds in which both types of data were collected from the same respondents aged 15 years and over were considered for the analysis. Datasets from 28 countries were used, including 16 countries in Africa, seven in Asia, three in Latin America, and two in Northern America and Europe. Of these, 20 are low- or lower-middle-income countries and eight are upper-middle-income or high-income countries, as based on the World Bank country income classification for fiscal year 2024.

The data considered in these analyses were collected in the GWP in 19 countries in 2021 and nine countries in 2022. In 2021, the countries were Benin, Bolivia (Plurinational State of), Burkina Faso, Cameroon, Ecuador, Egypt, Gabon, Ghana, Kenya, Mozambique, Nigeria, Senegal, Sierra Leone, South Africa, Türkiye, Uganda, the United Republic of Tanzania, the United States of America and Viet Nam. In 2022, they were Afghanistan, Albania, Armenia, Honduras, Kyrgyzstan, Malawi, Palestine, Tunisia and Uzbekistan.

Definition of variables

For food insecurity, a trichotomous variable was created using the respondent-level estimated probabilities of food insecurity, based on the FIES global reference scale. Respondents were classified as:

- **food secure or mildly food insecure** if the probability of moderate or severe food insecurity was less than 0.5;
- **moderately food insecure** if the probability of moderate or severe food insecurity was equal to or greater than 0.5 and the probability of severe food insecurity was less than 0.5;
- **severely food insecure** if the probability of severe food insecurity was equal to or greater than 0.5.

The following metrics for the properties of a healthy diet, derived from the DQQ, were considered:

- Minimum Dietary Diversity for Women (MDD-W), computed only for women 15 to 49 years of age: equal to one if the woman had consumed foods from at least 5 out of 10 listed food groups[a] (indicating a minimally acceptable level of dietary diversity) during the 24 hours preceding the interview, and zero otherwise.
- Zero vegetable or fruit (ZVF), computed for all respondents: equal to one if the respondent had not consumed any fruits or vegetables during the 24 hours preceding the interview, and zero otherwise.
- Animal-source food (ASF), computed for all respondents: equal to one if the respondent had consumed at least one animal-source food during the 24 hours preceding the interview, and zero otherwise.
- NCD-Protect score, computed for all respondents: ranging from 0 to 9, based on intake of foods from nine food groups[b] composed of foods containing dietary factors that are protective against non-communicable diseases (NCDs).

a The food groups are: grains, white roots and tubers, and plantains; pulses (beans, peas and lentils); nuts and seeds; dairy; meat, poultry and fish; eggs; dark green leafy vegetables; other vitamin A-rich fruits and vegetables; other vegetables; other fruits (one point per food group).

b The food groups are: whole grains; pulses; nuts and seeds; vitamin A-rich orange vegetables; dark green leafy vegetables; other vegetables; vitamin A-rich fruits; citrus fruits; and other fruits (one point per food group).

A higher score indicates inclusion of more health-promoting foods in the diet.

- NCD-Risk score, computed for all respondents: ranging from 0 to 9 based on intake of foods from eight food groups[c] containing dietary components that should be limited or avoided as per global dietary recommendations. A higher score reflects higher consumption of foods and drinks to avoid or limit.

Analysis

To study the association between food insecurity and properties of a healthy diet, all the data were pooled, and two distinct analyses were conducted:

- Associations between food insecurity severity and adherence to properties of a healthy diet were studied by computing each of the following according to three categories of food insecurity (food secure/mildly food insecure; moderately food insecure; severely food insecure):
  - the weighted proportion of women aged 15 to 49 years achieving MDD-W;
  - the weighted proportion of all respondents consuming ZVF;
  - the weighted proportion of all respondents who consumed any ASF;
  - the weighted average of NCD-Protect score;
  - the weighted average of NCD-Risk score.

- Regression models, to account for potential confounding effects:
  - Separate logit regression models were estimated using MDD-W, ZVF, ASF (all binary indicators) as dependent variables and food insecurity status as the independent variable, along with income quintiles, education, sex, country and urban/rural residence of the respondent considered as potential confounding variables.
  - Separate ordered logit regression models were estimated using NCD-Risk and NCD-Protect (considered as ordinal nominal variables) as dependent variables, and the same set of independent and potential confounding variables described in the point above.

c The food groups are: soft drinks; baked/grain-based sweets; other sweets; processed meats (2 points); unprocessed red meats; deep fried food; fast food and instant noodles; and packed highly processed salty snacks (one point per food group except for processed meats).

S2.5 Methodology for updating the estimates of the cost of a healthy diet

The International Comparison Program (ICP) coordinated by the World Bank is currently the only source of retail food price data for internationally standardized items, with new data only available once every three to four cyears. In previous editions of this report, the reference ICP data series was the one published in 2020, reflecting 2017 prices.[8] This year, the cost of a healthy diet (CoHD) indicator is based on the last ICP release of 2024, which reports on 2021 prices.[85]

The latest ICP 2024 round is chosen as the reference to update the cost this year because it includes the most recent food prices, reflecting food price patterns in post-COVID-19 pandemic years. Furthermore, the list of food items in the ICP 2024 wave is more comprehensive compared to the previous wave, as it collects prices for additional food items, including green leafy vegetables, which are a relatively cheap and nutritionally rich options for vegetables, especially in poorer countries.

Switching from the 2020 to the 2024 ICP data release to compute the CoHD may therefore also affect the composition of the reference Healthy Diet Basket (HDB) based on the new price information. For each country, the new composition of the HDB may therefore differ from the one previously used, since the list of items for which prices are collected in the two waves may differ and the prices reported for each item may also differ. Although the energy and nutritional contents of the HDB remain unchanged, the least-cost locally available foods that are selected among those that belong to a given food group may differ due to the expanded coverage of the ICP 2024 round, or because the least expensive items have changed. For this reason, readers should avoid directly comparing the series published this year with those in previous editions of the report.

In terms of how the series is constructed, the CoHD for 2021 is directly computed using ICP data, while it needs to be estimated for the years 2017, 2018, 2019, 2020 and 2022, when direct information on food items' prices is not available. Estimated costs are obtained by inflating or

deflating the 2021 prices using the consumer price index (CPI) for food and beverages.[9]

Specifically, to estimate the CoHD in year t, expressed in purchasing power parity units ($c(PPP)_t$), the 2021 CoHD expressed in the local currency unit ($c(LCU)_{2021}$) is first multiplied by the ratio between the food CPI in year t and that in 2021 (we denote this as $FCPI\ ratio^t_{2021}$), and finally divided by purchasing power parity conversion factors in year t (PPP_t):

$$c\ (PPP)_t = \frac{c(LCU)_{2021} \times FCPI\ ratio^t_{2021}}{PPP_t}$$

where t = 2017, 2018, 2019, 2020, 2022 and:

$$FCPI\ ratio^t_{2021}) = \left(\frac{FCPI_t}{FCPI_{2021}}\right)$$

Due to data limitations, the CoHD is updated using the aggregate CPI for food and beverages in the years when ICP food price data are unavailable. However, the food CPIs reflect average price changes for a basket of various food items defined in each country which may not accurately represent the price changes of foods in the HDB. In fact, by definition, the HDB is designed to include the cheapest nutritious foods that compose a healthy diet. This means that using the aggregate food CPI may lead to an overestimation of the CoHD. Further research is being conducted to construct a price index that reflects well the HDB composition.

S2.6 Methodology for estimating the unaffordabilty of a healthy diet

Conceptually, affordability is the condition by which households or individuals control sufficient resources to be able to procure the foods necessary to sustain consumption of a healthy diet. To operationalize this concept, the percentages and number of people in a population unable to afford a healthy diet are estimated by contrasting the distribution of incomes in the population with a fixed, normative cost threshold representing the amount of money needed to acquire the lowest cost combination of the locally available foods that are needed to compose a healthy diet, as well as all other non-food goods and services that are essential to conduct a dignified life.

In principle, as prevailing prices for both food and non-food goods and services vary by location, the ideal unit of analysis is the largest possible (usually subnational) area where the cost thresholds can be deemed equal for all the residing population.

Formally, the prevalence of unaffordability in an area s (PUA_s) can be estimated as follows,

Equation 1:

$$PUA_s = \int_{-\infty}^{r_s=c_s+n_s} f^s(x)dx$$

where r_s represents the fixed normative cost threshold, composed of the sum of the cost of a healthy diet (c_s) and the cost of non-food essential needs (n_s), and where $f^s(x)$ is the distribution of incomes among residents of the area considered. Then, the number of people unable to afford a healthy diet is simply computed as the product between the PUA_s and the population size N_s:

$$NUA_s = PUA_s \times N_s$$

Then, national estimates of NUA can be obtained by summing NUA_s over all relevant areas s, and PUA as the ratio between NUA and the national population size:

$$NUA = \sum_s NUA_s$$

$$PUA = \frac{NUA}{\sum_s N_s}$$

In practice, often the assessment can only be done for the entire national population or at the level of subnational geographic areas (such as urban vs rural, or administrative area units) that are larger than the ideal. This is because either the income distributions or the average costs – or both – are only available at that level. In such cases, one may still conduct the assessment using the formula in Equation 1, with reference to the *national* income distribution, $f(x)$, and the *national average* threshold $\bar{r}$, as follows:

Equation 2:

$$PUA = \int_{-\infty}^{\bar{r}} f(x)\,dx$$

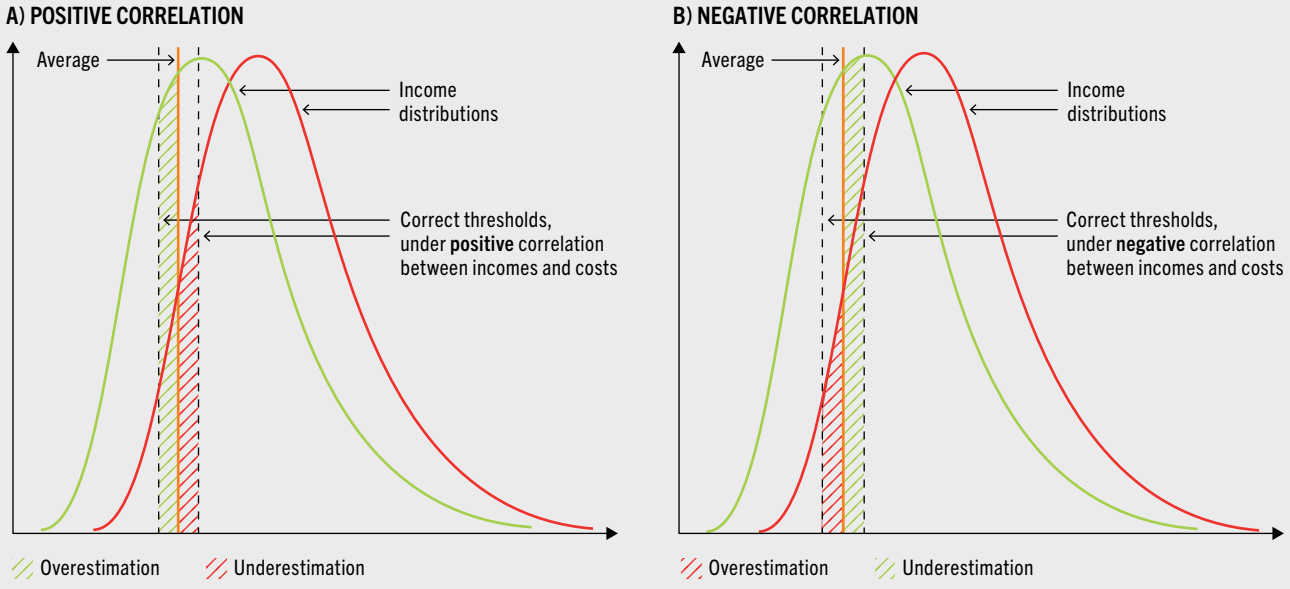
recognizing that the formula in Equation 2 will yield an unbiased estimate of the true PUA only if the distribution of subnational area level values of r is statistically independent of the distribution of incomes across the same subnational areas. »

BOX S2.1 WHY USING THE NATIONAL AVERAGE COST OF A HEALTHY DIET AND OF ESSENTIAL NEEDS MAY YIELD BIASED ESTIMATES OF THE PREVALENCE OF UNAFFORDABILITY

If there is a systematic relation between income levels and the sum of the cost of a healthy diet plus the cost of non-food essential needs, using the average $\bar{r}$ as a threshold (as in Equation 2), will over- or underestimate the true prevalence of unaffordability (PUA), depending on whether the relation is positive or negative and whether the average falls above or below the modal income. This is because, when a correlation exists between incomes and costs across the different locations in a country, use of the average threshold instead of the appropriate differing thresholds will induce misclassifications in each of the areas that will not cancel out in the aggregate. The reason is quite simple: in these models, where the issue boils down to evaluating areas under a probability density function, the probability of misclassifying units at the two opposite sides of the threshold is not equal, except in the (very special) case that the threshold happens to fall in a region where the probability density function is flat. When the true thresholds are located in areas of the distributions where the income probability density functions are increasing, using the average as a threshold will lead to an overestimation of the PUA, if average incomes and food and essential needs costs are positively correlated, and to an underestimation in the (less likely) opposite case.

To illustrate, Figure A shows income distributions for two hypothetical subnational geographic regions in a country, one where incomes are systematically higher and the other where they are systematically lower. The figure shows why errors in estimating the PUA, using an average as a threshold, do not cancel out if the correct values to use as thresholds are correlated with incomes.

FIGURE A OVERESTIMATION AND UNDERESTIMATION OF THE PREVALENCE OF UNAFFORDABILITY WHEN USING THE AVERAGE AS A THRESHOLD IF INCOMES ARE CORRELATED WITH COSTS



NOTE: The green line refers to the income distribution in a poorer geographical subregion and the red line refers to the income distribution in a comparatively richer subregion.
SOURCE: Authors' (FAO) own elaboration.

» In all other cases, the threshold as used in Equation 2 will generate a bias (see Box S2.1). Given that the existence and the sign of the spatial correlation between incomes and the appropriate cost thresholds are empirical questions, research is being conducted on a large number of datasets from recent surveys to determine the best approach to adjust the threshold and correct for the potential bias that is affecting the current estimates.

In this edition of the report, estimates of the *PUA* are computed using Equation 2, inferring income distributions from querying the World Bank Poverty and Inequality Platform, which provides an estimate of the percentage of the population with income below any specified threshold. For each year, the threshold provided is generated as the sum of the country-specific $CoHD_t^c$ and of an estimate of the amount of money (n_t^g) needed for essential non-food goods and services:

$$\bar{r}_t^c = CoHD_t^c + n_t^g$$

where the superscript c indicates the country and g the country income group.

The latter is estimated based on the values of the poverty lines used by the World Bank to compute estimates of extreme poverty, assuming a certain share of income spent on food that differs by country income group. Four different values of n are used depending on the country's latest classification as low, lower-middle, upper-middle or high income by the World Bank, as per Table S2.3.

S2.7 Methodology for projecting global nutrition indicator estimates to 2030

Methodology for stunting, anaemia, low birthweight, overweight, exclusive breastfeeding and wasting

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) use the following approach to project estimates beyond the latest year of available data. This methodology is based on applying the average annual rate of reduction (AARR) from the baseline year to the latest year with available data. For these indicators, the baseline year is 2012 in accordance with the baselines set forth in World Health Assembly (WHA) Resolution 65.6 – Comprehensive implementation plan for maternal, infant and young child nutrition.[10] For stunting, overweight, exclusive breastfeeding and wasting, the latest year is 2022. Anaemia and low birthweight have the latest years of 2019 and 2020, respectively.

Calculating the average annual rate of reduction

The AARR is calculated using a linear regression analysis. The dependent variables are the natural log transformations of all data points from the baseline to the latest year. The independent variables are all the years of available data. The coefficient of this linear regression (β) can be translated into the average annual rate of reduction by using the formula:

Equation 1: $$AARR = 1 - e^{\beta}$$

TABLE S2.3 CALCULATION OF THE COMPONENT OF THE COST THRESHOLD THAT CORRESPONDS TO ESSENTIAL NON-FOOD GOODS AND SERVICES

	International poverty line (a)	Non-food expenditure share (b)	Cost of basic non-food (a) × (b)
	(2017 PPP dollars per person per day)		
Low-income countries	2.15	0.37	0.80
Lower-middle-income countries	3.65	0.44	1.61
Upper-middle-income countries	6.85	0.54	3.70
High-income countries	24.36	0.54	13.20

NOTE: PPP = purchasing power parity.
SOURCE: Bai, Y., Herforth, A., Cafiero, C., Conti, V., Rissanen, M.O., Masters, W.A. & Rosero Moncayo, J. (forthcoming). *Methods for monitoring the affordability of a healthy diet*. FAO Statistics Division Working Paper. Rome, FAO.

Projecting estimates to 2030 based on average annual rate of reduction

The following formula is used when projecting estimates forwards beyond their latest estimate based on the AARR. The projected prevalence for year t_n, baseline year is t_0:

Equation 2:

$$Prevalence_{t_n} = Prevalence_{t_0} \times \left(1 - \frac{AARR}{100}\right)^{t_n - t_0}$$

Methodology for adult obesity

The WHO uses the following approach when projecting estimates for adult obesity beyond the latest year of available data. The methodology is based on applying the average change in probit-transformed prevalence from the baseline year to the latest year with available data. For adult obesity, the baseline is 2010, in accordance with the baselines set forth in WHA Resolution 66.10 – Follow-up to the Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases[11] and the Global Action Plan for the Prevention and Control of Non-Communicable Diseases.[12, 13] Estimates are based on the outputs of the Bayesian model, which WHO uses to estimate prevalence of adult obesity for each year, country, age and sex. First, the age-standardized prevalence of obesity is computed for ages 18 years and over for each year, each sex and both sexes, and for each country, for every Bayesian model iteration. Then following regression is fit to the estimates for 2010–2022 separately for each country-sex-iteration unit:

Equation 3: $\text{probit}(prev) = \alpha + \beta \times \text{year}$

The probit transformation is the inverse cumulative standard normal distribution function.

Projecting estimates to 2030

The following formula is used to project estimates forwards beyond their latest estimate for each year t_n, country, sex and iteration. The projected prevalence for year t_n, latest year (2022) is t_0:

Equation 4:

$$Prevalence_{t_n} = Normal\ Cumulative\ Density\ Function\left((\beta \times (t_n - t_0)) + probit(Prevalence_{t_0})\right)$$

Projected values for each year, country and sex are computed as the average of all iterations.

S2.8 Methodology for assessing country-level progress towards the global nutrition targets

Universe of countries

The analysis of countries' progress towards achieving the 2030 target(s) is based on the 195 countries that are common to the universe of countries for the indicators that are modelled (i.e. stunting, anaemia, low birthweight, overweight, adult obesity) and the reporting universe for the indicators that are based on primary data (i.e. exclusive breastfeeding, wasting).[14] This is done to ensure a consistent comparison across all indicators. The countries and areas in the analyses are: Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bhutan, Bolivia (Plurinational State of), Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Burundi, Cabo Verde, Cambodia, Cameroon, Canada, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo, Cook Islands, Costa Rica, Côte d'Ivoire, Croatia, Cuba, Cyprus, Czechia, Democratic People's Republic of Korea, Democratic Republic of the Congo, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Eswatini, Ethiopia, Fiji, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, Iceland, India, Indonesia, Iran (Islamic Republic of), Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Lao People's Democratic Republic, Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, Luxembourg, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia (Federated States of), Monaco, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nauru, Nepal, Netherlands (Kingdom of the), New Zealand, Nicaragua, Niger, Nigeria, Niue, North Macedonia, Norway, Oman, Pakistan,

TABLE S2.4 2030 GLOBAL MATERNAL, INFANT AND YOUNG CHILDREN NUTRITION TARGETS

Indicator	Target
Stunting	50% reduction in the number of children under 5 who are stunted
Anaemia	50% reduction in anaemia in women of reproductive age
Low birthweight	30% reduction in low birthweight
Overweight	Reduce and maintain childhood overweight to less than 3%
Exclusive breastfeeding	Increase the rate of exclusive breastfeeding in the first 6 months up to at least 70%
Wasting	Reduce and maintain childhood wasting to less than 3%
Adult obesity	Halt the rise of obesity

SOURCE: Authors' (WHO, UNICEF) own elaboration.

Palau, Palestine, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Republic of Korea, Republic of Moldova, Romania, Russian Federation, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, South Sudan, Spain, Sri Lanka, Sudan, Suriname, Sweden, Switzerland, Syrian Arab Republic, Tajikistan, Thailand, Timor-Leste, Togo, Tonga, Trinidad and Tobago, Tunisia, Türkiye, Turkmenistan, Tuvalu, Uganda, Ukraine, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, United Republic of Tanzania, United States of America, Uruguay, Uzbekistan, Vanuatu, Venezuela (Bolivarian Republic of), Viet Nam, Yemen, Zambia and Zimbabwe.

Targets

The targets for the various indicators are presented in Table S2.4.

Calculating the average annual rate of reduction

The progress assessments for all indicators except adult obesity are based on average annual rates of reduction. These rates of reduction are calculated using a linear regression analysis. The dependent variables are the natural log transformations of all data points. The independent variables are all the years for the data points. The coefficient of this linear regression (β) can be translated into the average annual rate of reduction by using the formula:

Equation 5: $AARR = 1 - e^{\beta}$

Establishing baselines

Stunting, anaemia, low birthweight and overweight are model based and as a result, there is a consistent country-level time series. For these indicators, the baseline is 2012.

Exclusive breastfeeding and wasting are based on primary data, which are predominantly nationally representative surveys. The timing of these surveys is not consistent across countries.

As such, the baseline is defined as follows:

1. If the country has data between 2005 and 2012 → Select the latest data point in this year range.
2. If the country only has data from 2013 onwards → Select the earliest data point in this year range.

Calculating the current average annual rate of reduction

The current AARR is calculated using all the data points from the baseline to the latest year of available data. For the indicators based on primary data, there must be at least two data points with one of the data points after the baseline period of 2005–2012.

Calculating the required average annual rate of reduction

The required AARR is the AARR required to reach the target in 2030. This is calculated using two data points: the baseline data point and the target prevalence:

TABLE S2.5 ON-TRACK PREVALENCE LEVELS FOR SIX GLOBAL MATERNAL, INFANT AND YOUNG CHILDREN INDICATORS

Indicator	On-track prevalence level	Statistic used to assess prevalence level
Childhood stunting	3% or below	Lower limit
Anaemia in women of reproductive age	5% or below	Point estimate
Low birthweight	5% or below	Point estimate
Childhood overweight	3% or below	Point estimate
Exclusive breastfeeding in the first 6 months	70% or above	Point estimate
Childhood wasting	3% or below	Point estimate

SOURCE: Authors' (WHO, UNICEF) own elaboration.

TABLE S2.6 RULES FOR ASSESSING PROGRESS TOWARDS THE SEVEN GLOBAL NUTRITION TARGETS

	Progress assessments		
Indicator	**On track**	**Off track**	**Assessment not possible**
Stunting	Lower limit of latest prevalence below 3% OR Current AARR ≥ required AARR	Current AARR < required AARR	Country did not have input data to contribute to the modelling exercise. Country did not have input data after 1999.
Anaemia	Current AARR ≥ required AARR (3.78% per year)	Current AARR < required AARR (3.78% per year)	Country did not have input data to contribute to the modelling exercise.
Low birthweight	Point estimate of latest prevalence below 5% OR Current AARR ≥ required AARR (1.96% per year)	Current AARR < required AARR (1.96% per year)	Country did not have input data to contribute to the modelling exercise.
Exclusive breastfeeding*	Point estimate of latest prevalence (2013 onwards) below 30% OR Current AARR ≥ required AARR	Current AARR < required AARR	Country does not have at least 2 data points with one of the data points after the baseline period of 2005–2012.
Overweight	Point estimate of latest prevalence below 3% OR Current AARR ≥ required AARR	Current AARR < required AARR	Country did not have input data to contribute to the modelling exercise. Country did not have input data after 1999.
Wasting	Point estimate of latest prevalence (2013 onwards) below 3% OR Current AARR ≥ required AARR	Current AARR < required AARR	Country does not have an estimate.
Adult obesity	Posterior probability of a decreasing trend > 0.5	Posterior probability of a decreasing trend ≤ 0.5	n.a.

NOTES: n.a. = not available; AARR = average annual rate of reduction. * Progress assessments for exclusive breastfeeding are based on non-exclusive breastfeeding (100-exclusive breastfeeding).
SOURCE: Authors' (WHO, UNICEF) own elaboration.

Equation 6:

$$Required\ AARR\ = 100\ \times (1 - e^{a})$$

where:

$$a\ = \frac{\ln(2030\ Target\ Prevalence) - \ln(Baseline\ Prevalence)}{2030 - Baseline\ Year}$$

On-track prevalence level

The prevalence thresholds presented in Table S2.5 are used to determine if a country is on track to achieve the target regardless of the current AARR and the required AARR. For all indicators except for stunting, this assessment is based on

only the point estimate. Assessments for stunting based on prevalence level are based on the lower confidence interval limit.

Calculating the posterior probability of a true increase

Progress assessments for adult obesity are based on posterior probability that the prevalence of obesity is truly flat or decreasing. Posterior probabilities are a measure of certainty. They indicate – based on available data and assumptions – our estimated probability of a certain outcome being true (e.g. prevalence was flat or decreasing from 2010 to 2022). The regression analysis described in Equation 3 is used to compute these posterior probabilities. We report the posterior probability that an estimated change in obesity prevalence represents a truly decreasing trend as the percentage of Bayesian iterations for which β is less than or equal to 0. Countries are assessed as being on track if the posterior probability of a flat or decreasing trend is greater than 0.5, and otherwise are considered to be off track.

The rules for assessing progress towards the seven global nutrition targets are summarized in Table S2.6.

Population weights

For the estimates of percentage of total population living in countries that are on track, off track and no assessment, the analysis is based on the same population weights used to generate regional and global aggregates as defined in **Annex 1B** of the main report. These are as follows:

1. Stunting, overweight, wasting: children under five years of age (sum of children aged 0 through 4)
2. Anaemia: females aged 15–49 (sum of females aged 15 through 49)
3. Low birthweight: live births
4. Exclusive breastfeeding: children aged 0–6 months (half of children aged 0)
5. Adult obesity: adults aged 18–100+ (sum of adults aged 18 through 100+)

For consistent comparisons, the constant year of 2023 is used for all indicators. ■

SUPPLEMENTARY MATERIAL TO CHAPTER 3

S3.1 Comparison of definitions of financing for food security and nutrition: official development assistance

As highlighted in **Section 3.1** of the main report, the current state of financing for food security and nutrition is hard to measure as there is neither a unified definition of what constitutes financing for food security and nutrition, nor a common approach to measuring what comprises it, no matter whether the financing stream is public or private, domestic or foreign. This is easiest to illustrate in studies that estimate levels of official development assistance (ODA) financing, where perhaps the greatest efforts to define financing for food security and nutrition have been made. Yet here, different groups still use varying measures to identify ODA financing relevant to food security and nutrition. Table S3.1 provides a comparison of the various definitions of financing for food security and nutrition from the studies presented in Figure 14 of the main report, whereby the blue-coloured boxes indicate which ODA OECD Development Assistance Committee (DAC) codes are included in their measures. While there are some convergences on the DAC coding applied, there are significant differences, resulting in a wide variation of estimates of levels of ODA financing for food security and nutrition (see Figure 14 of the main report).

For example, to track commitments made under the L'Aquila Food Security Initiative – a pledge to spend USD 20 billion over three years following the 2009 food price crisis – donors recorded spending under the agriculture, forestry and fisheries purpose codes, adding agro-industries, nutrition and development food aid/food security assistance. They also added purpose codes related to transport, storage, safety nets, rural development, and "other".[15–17] However, each of the G7 donor countries individually decided which purpose codes and what volume of investments are related to food security, with limited guidance or methodology.[18]

Alternatively, to measure the resources relevant to the G7 Elmau commitment to "lift 500 million people in developing countries out of hunger and malnutrition by 2030",[19] there are three indicators. The first tracks the "percentage of G7 member programmes on agriculture and rural development that include objectives and expected results to increase the incomes of smallholder farmers";[20] the definition considers the number of projects recorded under the codes for agriculture, forestry and fishing, adding agro-industries and rural development.[21] The second measures direct assistance to agriculture, fishing, food security and nutrition defined by the OECD DAC codes for agriculture (311), fishing (313), agro-industries (32161), development food assistance (520), emergency food assistance (72040) and basic nutrition (12240). The third – "other assistance with explicit objectives to improve people's food security and/or nutrition"[20] – captures the broadened scope of resources that affect food security and nutrition, using a keyword search in a series of codes.[d, 22]

d The following purpose codes are included: 112, 12220, 12261, 12281, 13020, 140, 16010, 16050, 16062, 210, 23210, 23310, 24030, 24040, 25010, 312, 32165, 32267, 41010, 41030, 43030, 43040, 73010 and 74010. Keywords <Hunger-sensitive> listed as the following: food security, food insecurity, hunger, access to food, food availability, food utilization, food stability, food price, hunger gap, lean season, food self-sufficiency, food poverty, food trade, dietary diversity, food policy, right to food, food sovereignty, food fortification, food systems, food stocks, biofortification, food preferences, food preparation, feeding practices, food storage, food safety, wild foods, food reserves, food consumption, net consumer household. Keywords <Nutrition sensitive> listed as the following: aflatoxin, biofortification, breastfeeding, cash transfer, child feeding, CMAM (community management of acute malnutrition), deworming, diarrheal disease, diet, dietary diversification, direct feeding, enteropathy, feeding, feeding programme, feeding programme food intake, food intake, food security, food subsidy, food voucher, fortification, GAM (global acute malnutrition), garden, gastrointestinal illness, global nutrition coordination, growth monitoring, growth monitoring and promotion. »

TABLE S3.1 COMPARISON OF DEFINITIONS OF FINANCING FOR FOOD SECURITY AND NUTRITION: OFFICIAL DEVELOPMENT ASSISTANCE ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT DEVELOPMENT ASSISTANCE COMMITTEE CODES

		FOOD SECURITY			FOOD SECURITY AND NUTRITION					*THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024*	
Creditor Reporting System (CRS) code	CRS label	L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
11110	Education policy and administrative management										22% + keywords
11120	Education facilities and training										22% + keywords
11130	Teacher training										22% + keywords
11182	Educational research										22% + keywords
11220	Primary education				+ keywords						22% + keywords
11230	Basic life skills for youth and adults				+ keywords						22% + keywords
11231	Basic life skills for youth										22% + keywords
11232	Primary education equivalent for adults										22% + keywords
11240	Early childhood education				+ keywords						22% + keywords
11250	School feeding				+ keywords					+ keywords	
11260	Lower secondary education										22% + keywords
11320	Upper secondary education (modified and includes data from 11322)										22% + keywords
11330	Vocational training										22% + keywords
11420	Higher education										22% + keywords

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					*THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024*	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
11430	Advanced technical and managerial training										22% + keywords
12110	Health policy and administrative management									22% + keywords	
12181	Medical education/ training									22% + keywords	
12182	Medical research									22% + keywords	
12191	Medical services									22% + keywords	
12220	Basic health care				+ keywords					22% + keywords	
12230	Basic health infrastructure									22% + keywords	
12240	Basic nutrition			10%						+ keywords	
12250	Infectious disease control									22% + keywords	
12261	Health education				+ keywords					22% + keywords	
12262	Malaria control									22% + keywords	
12263	Tuberculosis control									22% + keywords	
12264	COVID-19 control									22% + keywords	
12281	Health personnel development				+ keywords					22% + keywords	
12310	NCDs control, general									22% + keywords	
12320	Tobacco use control									22% + keywords	

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
12330	Control of harmful use of alcohol and drugs									22% + keywords	
12340	Promotion of mental health and well-being									22% + keywords	
12350	Other prevention and treatment of NCDs									22% + keywords	
12382	Research for prevention and control of NCDs									22% + keywords	
13010	Population policy and administrative management										22% + keywords
13020	Reproductive health care				+ keywords						22% + keywords
13030	Family planning										22% + keywords
13040	STD control including HIV/AIDS										22% + keywords
13081	Personnel development for population and reproductive health										22% + keywords
14010	Water sector policy and administrative management				+ keywords					22% + keywords	
14015	Water resources conservation (including data collection)				+ keywords					+ keywords	
14020	Water supply and sanitation – large systems				+ keywords					+ keywords	

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
14021	Water supply – large systems				+ keywords					22% + keywords	
14022	Sanitation – large systems				+ keywords					+ keywords	
14030	Basic drinking water supply and basic sanitation				+ keywords					+ keywords	
14031	Basic drinking water supply				+ keywords					+ keywords	
14032	Basic sanitation				+ keywords					+ keywords	
14040	River basins' development				+ keywords					22% + keywords	
14050	Waste management/ disposal				+ keywords					+ keywords	
14081	Education and training in water supply and sanitation				+ keywords					+ keywords	
15110	Public sector policy and administrative management										
15111	Public finance management (PFM)										
15112	Decentralisation and support to subnational government										
15113	Anti-corruption organisations and institutions										
15114	Domestic revenue mobilisation										22% + keywords
15125	Public procurement										

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
15130	Legal and judicial development										
15142	Macroeconomic policy										
15150	Democratic participation and civil society			10%							22% + keywords
15151	Elections										
15152	Legislatures and political parties										
15153	Media and free flow of information										
15160	Human rights										22% + keywords
15170	Women's rights organisations and movements, and government institutions			10%							22% + keywords
15180	Ending violence against women and girls										22% + keywords
15210	Security system management and reform										22% + keywords
15220	Civilian peace-building, conflict prevention and resolution										22% + keywords
15230	Participation in international peacekeeping operations										22% + keywords
15240	Reintegration and SALW control										22% + keywords

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
15250	Removal of land mines and explosive remnants of war										22% + keywords
15261	Child soldiers (prevention and demobilisation)										22% + keywords
15190	Facilitation of orderly, safe, regular and responsible migration and mobility										22% + keywords
16010	Social protection				+ keywords						
16020	Employment creation										22% + keywords
16030	Housing policy and administrative management										22% + keywords
16040	Low-cost housing										22% + keywords
16050	Multi-sector aid for basic social services				+ keywords					+ keywords	
16061	Culture and recreation										22% + keywords
16062	Statistical capacity building				+ keywords						
16063	Narcotics control										
16064	Social mitigation of HIV/AIDS			10%							
16070	Labour rights										22% + keywords
16080	Social dialogue										22% + keywords

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
21010	Transport policy and administrative management				+ keywords					22% + keywords	
21020	Road transport			10%	+ keywords					22% + keywords	
21030	Rail transport				+ keywords					22% + keywords	
21040	Water transport				+ keywords					22% + keywords	
21050	Air transport				+ keywords						
21061	Storage				+ keywords					+ keywords	
21081	Education and training in transport and storage				+ keywords					+ keywords	
22010	Communications policy and administrative management										
22020	Telecommunications									22% + keywords	
22030	Radio/television/ print media										
22040	Information and communication technology (ICT)									22% + keywords	
23110	Energy policy and administrative management									22% + keywords	
23181	Energy education/ training									22% + keywords	
23182	Energy research									22% + keywords	

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
23183	Energy conservation and demand-side efficiency									22% + keywords	
23210	Energy generation, renewable sources – multiple technologies				+ keywords						22% + keywords
23220	Hydro-electric power plants										22% + keywords
23230	Solar energy for centralised grids										22% + keywords
23231	Solar energy for isolated grids and standalone systems										22% + keywords
23232	Solar energy – thermal applications										22% + keywords
23240	Wind energy										22% + keywords
23250	Marine energy										22% + keywords
23260	Geothermal energy										22% + keywords
23270	Biofuel-fired power plants										22% + keywords
23310	Energy generation, non-renewable sources, unspecified				+ keywords					22% + keywords	
23320	Coal-fired electric power plants									22% + keywords	
23330	Oil-fired electric power plants									22% + keywords	
23340	Natural gas-fired electric power plants									22% + keywords	

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
23350	Fossil fuel electric power plants with carbon capture and storage (CCS)									22% + keywords	
23360	Non-renewable waste-fired electric power plants									22% + keywords	
23410	Hybrid energy electric power plants										22% + keywords
23510	Nuclear energy electric power plants and nuclear safety										22% + keywords
23610	Heat plants									22% + keywords	
23620	District heating and cooling										
23630	Electric power transmission and distribution (centralised grids)									22% + keywords	
23631	Electric power transmission and distribution (isolated mini-grids)									22% + keywords	
23640	Retail gas distribution									22% + keywords	
23641	Retail distribution of liquid or solid fossil fuels									22% + keywords	
23642	Electric mobility infrastructures									22% + keywords	
24010	Financial policy and administrative management			10%						22% + keywords	
24020	Monetary institutions										

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
24030	Formal sector financial intermediaries			10%	+ keywords						
24040	Informal/semi-formal financial intermediaries			10%	+ keywords						
24050	Remittance facilitation, promotion and optimisation										22% + keywords
24081	Education/training in banking and financial services										22% + keywords
25010	Business Policy and Administration			10%	+ keywords						22% + keywords
25020	Privatisation										
25030	Business development services										22% + keywords
25040	Responsible business conduct										22% + keywords
31110	Agricultural policy and administrative management									+ keywords	
31120	Agricultural development									+ keywords	
31130	Agricultural land resources									+ keywords	
31140	Agricultural water resources									+ keywords	
31150	Agricultural inputs									+ keywords	
31161	Food crop production									+ keywords	

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
31162	Industrial crops/ export crops										22% + keywords
31163	Livestock									+ keywords	
31164	Agrarian reform										22% + keywords
31165	Agricultural alternative development									+ keywords	
31166	Agricultural extension									+ keywords	
31181	Agricultural education/training									+ keywords	
31182	Agricultural research									+ keywords	
31191	Agricultural services									+ keywords	
31192	Plant and post-harvest protection and pest control									+ keywords	
31193	Agricultural financial services									+ keywords	
31194	Agricultural co-operatives									+ keywords	
31195	Livestock/ veterinary services									+ keywords	
31210	Forestry policy and administrative management				+ keywords					+ keywords	
31220	Forestry development				+ keywords					+ keywords	
31261	Fuelwood/charcoal				+ keywords						22% + keywords

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
31281	Forestry education/ training				+ keywords						22% + keywords
31282	Forestry research				+ keywords						22% + keywords
31291	Forestry services				+ keywords						22% + keywords
31310	Fishing policy and administrative management									+ keywords	
31320	Fishery development									+ keywords	
31381	Fishery education/ training									+ keywords	
31382	Fishery research									+ keywords	
31391	Fishery services									+ keywords	
32110	Industrial policy and administrative management										22% + keywords
32120	Industrial development										22% + keywords
32130	Small and medium-sized enterprises (SME) development			10%							22% + keywords
32140	Cottage industries and handicraft			10%							22% + keywords
32161	Agro-industries			10%						+ keywords	
32162	Forest industries			10%							22% + keywords
32163	Textiles, leather and substitutes			10%							22% + keywords
32164	Chemicals										22% + keywords

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
32165	Fertilizer plants				+ keywords					+ keywords	
32166	Cement/lime/ plaster										22% + keywords
32167	Energy manufacturing (fossil fuels)										22% + keywords
32168	Pharmaceutical production									22% + keywords	
32169	Basic metal industries										22% + keywords
32170	Non-ferrous metal industries										22% + keywords
32171	Engineering										22% + keywords
32172	Transport equipment industry										
32173	Modern biofuels manufacturing										
32174	Clean cooking appliances and manufacturing									+ keywords	
32182	Technological research and development										22% + keywords
32210	Mineral/mining policy and administrative management										
32220	Mineral prospection and exploration										
32261	Coal									22% + keywords	
32262	Oil and gas (upstream)										

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
32263	Ferrous metals										
32264	Nonferrous metals										
32265	Precious metals/ materials										
32266	Industrial minerals										
32267	Fertilizer minerals				+ keywords					+ keywords	
32268	Offshore minerals										
33110	Trade policy and administrative management			10%							22% + keywords
33120	Trade facilitation			10%							22% + keywords
33130	Regional trade agreements (RTAs)										22% + keywords
33140	Multilateral trade negotiations										22% + keywords
33150	Trade-related adjustment										22% + keywords
33181	Trade education/ training										22% + keywords
41010	Environmental policy and administrative management				+ keywords						22% + keywords
41020	Biosphere protection										22% + keywords
41030	Bio-diversity				+ keywords						22% + keywords
41040	Site preservation										22% + keywords
41081	Environmental education/training										22% + keywords

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
41082	Environmental research										22% + keywords
43010	Multisector aid										
43030	Urban development and management				+ keywords						22% + keywords
43040	Rural development				+ keywords					+ keywords	
43050	Non-agricultural alternative development			10%						22% + keywords	
43060	Disaster risk reduction										22% + keywords
43071	Food security policy and administrative management				+ keywords					+ keywords	
43072	Household food security programmes				+ keywords					+ keywords	
43073	Food safety and quality				+ keywords					+ keywords	
43081	Multi-sector education/training										22% + keywords
43082	Research/scientific institutions										
51010	General budget support-related aid			10%							
52010	Food assistance									+ keywords	
53030	Import support (capital goods)										
53040	Import support (commodities)									22% + keywords	
60010	Action relating to debt										
60020	Debt forgiveness										22% + keywords

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
60030	Relief of multilateral debt										22% + keywords
60040	Rescheduling and refinancing										22% + keywords
60061	Debt for development swap										22% + keywords
60062	Other debt swap										22% + keywords
60063	Debt buy-back										22% + keywords
72010	Material relief assistance and services			10%							22% + keywords
72040	Emergency food assistance									+ keywords	
72050	Relief co-ordination and support services										22% + keywords
73010	Immediate post-emergency reconstruction and rehabilitation			10%	+ keywords						22% + keywords
74010	Disaster prevention and preparedness (included in G7 documentation but no longer exists; split into 74020 multi-hazard preparedness and 43060 disaster risk reduction for reporting on 2018 flows)				+ keywords						
74020	Multi-hazard response preparedness										22% + keywords

TABLE S3.1 (Continued)

Creditor Reporting System (CRS) code	CRS label	FOOD SECURITY			FOOD SECURITY AND NUTRITION					*THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD 2024*	
		L'Aquila Food Security Initiative	Ceres2030	Overseas Development Institute	G7 (Elmau + keywords)	Duke University	Seek development	ZEF and FAO	European Commission	Core definition	Extended definition
91010	Administrative costs (non-sector allocable) of donors										
93010	Refugees/asylum seekers in donor countries (non-sector allocable)										22% + keywords
99810	Sectors not specified										

NOTES: ZEF = Center for Development Research of the University of Bonn; NCD = non-communicable disease; STD = sexually transmitted disease; SALW = small arms and light weapons.
The table includes all Organisation for Economic Co-operation and Development Development Assistance Committee (OECD DAC) purpose codes. Blue-filled cells indicate that 100 percent of the resources recorded under the associated OECD DAC code are included in the financing for food security and nutrition definition. Where "10%" or "22%" appears in a blue-filled cell, this indicates the percentage of the resources recorded under the associated OECD DAC code which are included in the official development assistance definition and indicate the percentage of these resources that contribute to food security and nutrition. Keyword(s) indicates that a keyword search was also conducted at a lower level to the purpose code (e.g. project descriptions).
SOURCES: Comparison of previous studies is adapted from FEber Rose, M., Laborde, D., Lefebvre, L., Olivetti, E. & Smaller, C. 2024. *Towards a common definition of aid for food security and nutrition.* Rome, FAO and Geneva, Switzerland, Shamba Centre for Food & Climate; AFSI (L'Aquila Food Security Initiative). 2012a. *Tracking the L'Aquila Food Security Initiative pledge and related funding*. L'Aquila, Italy. https://2009-2017.state.gov/documents/organization/202955.pdf; AFSI. 2012b. *L'Aquila Food Security Initiative (AFSI) 2012 Report.* L'Aquila, Italy. https://2009-2017.state.gov/documents/organization/202922.pdf; Laborde, D., Murphy, S., Parent, M., Porciello, J. & Smaller, C. 2020. *Ceres2030: Sustainable solutions to end hunger - Summary report.* Cornell University, IFPRI and IISD. https://ceres2030.iisd.org/wp-content/uploads/2021/03/ceres2030_en-summary-report.pdf; ODI (Overseas Development Institute). 2012. *Measuring aid to agriculture and food security.* Briefing Paper 72. London. https://cdn.odi.org/media/documents/7588.pdf; G7 France. 2019. *Biarritz Progress Report – G7 Development and Development-Related Commitments.* Biarritz, France, Ministry for Europe and Foreign Affairs. https://www.diplomatie.gouv.fr/IMG/pdf/rapport-g7-v8_cle852e6f-1.pdf; Yaagoub, Z. & Jaeger, K. 2021. *Hunger in times of crisis: Trends in donor financing for food and nutrition security.* Seek Development; Bharali, I., Zoubek, S., McDade, K.K., Martinez, S., Brizzi, A., Yamey, G., Brownell, K. & Schäferhoff, M. 2020. *The financing landscape for agricultural development: An assessment of external financing flows to low- and middle-income countries and of the global aid architecture.* Durham, USA, Duke World Food Policy Center, Duke Center for Policy Impact in Global Health and Open Consultants. https://wfpc.sanford.duke.edu/wp-content/uploads/sites/15/2022/05/AgDevFinancing-WFPC-Dec2020.pdf; ZEF (Center for Development Research of the University of Bonn) & FAO. 2020. *Investment costs and policy action opportunities for reaching a world without hunger (SDG2).* Rome and Bonn. https://doi.org/10.4060/cb1497en

» The most expansive definition of ODA is that adopted by the European Commission to track expenditure on commitments related to food security and nutrition. This definition of ODA to food security and nutrition counts ODA recorded under 75 Creditor Reporting System (CRS) purpose codes, ranging from vocational training and education to reproductive health care, human rights, and democratic participation and civil society. The breadth of the codes included is designed to capture any expenditure and action undertaken by European Union Member States that may contribute towards food security and nutrition and sustainable agriculture.[23]

In the last two columns of this table, the definition of food security and nutrition presented in this report is provided for comparison; however, please note that in the application of this new definition in the ODA estimates presented in **Section 4.1** of the main report, the methodology does not apply only CRS purpose codes, but a combination of purpose codes with other recovery keywords (indicated by "keyword" in Table S3.1). The only other study which took a similar approach is the G7 study, though this was applied in a more limited way. Therefore, the comparison of this report's new definition of financing for food security and nutrition in the last two columns of Table S3.1 is not strictly comparable to the other studies presented in Table S3.1.[e]

Challenges: specific and supportive contributions to food security and nutrition

It is important to distinguish between specific and supportive financing for food security and nutrition. There are important financial allocations that contribute to food security and nutrition without supporting only food security and nutrition outcomes. For example, a road construction project will have positive benefits for food security and nutrition; however, the financial resources involved will also have broader development benefits, such as enhancing the availability of imported commodities or tourism. Thus, not all the resources would entirely contribute to only food security and nutrition outcomes. This concept of a supportive impact on food security and nutrition is particularly important for the extended definition, as not all the financing for interventions to address the major drivers will have direct impacts on just food security and nutrition.

The methodology used to estimate the volume of public external resources for food security and nutrition must therefore distinguish between specific and supportive financing for food security and nutrition to enable a better and more accurate estimate of the entirety of financing relevant to food security and nutrition. A percentage or weight can be applied to different financing components included in the core and extended definitions of financing for food security and nutrition to distinguish between specific and supportive contributions. Under this approach, keywords directly relevant to food security and nutrition are weighted at 100 percent, that is 100 percent of the resources identified as related to these keywords will be included in the estimate of food and security and nutrition financing, whereas other keywords, which relate to resources more indirectly contributing to food security and nutrition, would be allocated a lower percentage.

However, there is little precedent on which to calculate an appropriate percentage to capture the indirect financing of resources. There have been two prior attempts in efforts to estimate external public resources for food security and nutrition. Under the L'Aquila Food Security Initiative, G7 donors were able to add ODA recorded under non-specified purpose codes providing their main purpose was to improve food security.[15–17] Each G7 country individually decided which purpose codes and what volume of investments were related to food security, with limited guidance or methodology, leaving significant subjectivity in the definition and final volumes of ODA and limiting what can be learned from this approach.[18]

In its definition of ODA for agriculture and rural development and food security, the Overseas Development Institute calculated a relevant share of some OECD DAC purpose codes to include the definition. For example, the share of agricultural value added in developing countries' GDP was

e For the full list of keywords applied in definitions in this report see **Section S3.2**, Table S3.3, and for the methodology for the ODA analysis see Supplementary material to Chapter 4.

calculated to be 10 percent; therefore, 10 percent of ODA for financial services, business support services and general budget support was included in the measure.

To estimate an appropriate weighting for each financing flow, certain assumptions must be made. The first is whether the financing for each category, as a general rule, will have a direct or indirect impact on food security. In this regard, each category of financing was either specific to or supportive of food security and nutrition (see **Section S3.2**). The resources under categories such as food aid or food safety and storage were deemed to be specific to food security and nutrition, while the resources under the affordability of and access to health services or water and sanitation were deemed to be supportive of food security and nutrition. That is, not all the resources related to these categories would entirely contribute to food security and nutrition outcomes.

Identifying appropriate weights for each category requires assumptions about relative contributions of financial allocations to food security and/or nutrition. All aspects of financing for food security and nutrition have varying levels of impact, and establishing an appropriate weighting requires a generalization of impact and an estimation of what the impact is. Different approaches and weights will be relevant to different funding sectors, each requiring that assumptions be made about relative contributions.

For specific financing categories, it was decided to accept the commonly applied assumption of 100 percent weight, meaning that the full financial resources contribute to food security and/or nutrition. This is a common assumption in most existing studies (for example, see Figure 14 of the main report and Table S3.1); however, even this requires strong assumptions. For example, certain aspects of domestic production related to agriculture are included as specific contributions to food security and nutrition and are therefore included at 100 percent. However, it is a strong assumption, albeit a common one, that all spending on agriculture will have a direct impact on food security. Investment in a tea plantation in Kenya, which would be classified under domestic production, may have negative specific impacts on food security and nutrition if, for example, resources are used to relocate displaced smallholder farmers in the area or to hold consultations with local communities about the planned development, with limited impact on food security and nutrition. Therefore, even the contribution of specific financing to food security and nutrition needs qualifying.

For supportive financing, the weightings should arguably be more nuanced, with different weightings applied to different sectors and purposes, depending on their relative contribution to food security and nutrition outcomes. Yet, this is even more complicated, as all aspects of finance that indirectly support food security and nutrition have varying levels of impact, and establishing an appropriate weighting requires a generalization of the impact and an estimation of what the impact is. Different approaches and weightings will be relevant to different financing sectors. For example, an appropriate contribution of social protection to food security and nutrition could be estimated using household food expenditure as a percentage of GDP in developing countries. For women's empowerment, youth inclusion, equitable access to productive resources and assets, access to essential services, and fiscal reform to improve income distribution, a more appropriate proxy might be a measurement constructed from the percentage of people employed in agriculture and the contribution of agriculture to GDP. For energy, the relative use of energy in the agriculture and food sector could be used. However, more research is needed to establish more nuanced and sector-specific weights.

Introducing several sector-related weights without sufficient evidence of impact research and testing is risky, as it can destabilize the results, creating more biases and errors. Furthermore, data gaps and data limitations in current financing flow databases prevent a full application of the definition (see **Section 4.1** of the main report), which can further compound the biases and errors introduced by the addition of more nuanced weights. For example, this report considered applying a unique weight for the supportive elements

of health services and environmental health (see **Section S3.2**). The rationale was to apply a weight estimate based on the percentage of total current health expenditure that was spent on "nutrition deficiencies" defined by the System of Health Accounts[24] and estimated by the World Bank based on the available data between 2017 and 2019 in the WHO Global Health Expenditure Database.[f] However, this estimate covers expenditure on both specific and supportive elements under health services and environmental health, as well as practices (see **Section S3.2**). Thus, applying this nuanced weight would introduce further errors due to its mismatch with the definition level of aggregation, as well as the financing flow data disaggregation limitations.

For the reasons cited above, as a best option at this time, this report applies a single weight of 22 percent applied to all supportive elements (see Table S3.1 and **Section S3.2**) to reflect the impact of supportive expenditures on food security and nutrition as closely as possible. The weight, 22 percent, was calculated based on household spending on food as a percentage of GDP in low-income countries (LICs), lower-middle-income countries (LMICs) and upper-middle-income countries (UMICs). The source for share of food consumption in household consumption in LICs, LMICs and UMICs is FAOSTAT,[26] while for household consumption as a percentage of GDP in LMICs it is the World Bank.[27] Further research and testing is needed to identify the contribution of financial allocations to improved food security and nutrition (beyond the agriculture sector), as well as advancements in financial data and data mining methodologies to achieve higher resolution of financing flows contributing to improved food security and ending all forms of malnutrition.

f An unpublished estimate by the World Bank based on the available data between 2017 and 2019 in the WHO Global Health Expenditure Database.[25]

S3.2 A new definition of financing for food security and nutrition: mapping classification, keywords, weights and decision rules

Table S3.2 provides the four classification levels in tabular form, based on the conceptual framing of the new definition of financing for food security and nutrition presented in **Section 3.1** of the main report (see Figure 15 of the main report). This four-level classification makes up the foundational classification structure.

Table S3.3 is the elaboration of the four-level classification with keywords identified to clarify financing flows linked to each classification level. Keywords are defined based on food security and nutrition expenditures and intervention areas for each level of classification defined at level 3 or level 4 (column 5). Keywords in bold are the purpose code description names of ODA/other official flows (OOF) CRS codes; these are added to ensure coherence in applying sector and subsector purposes across different financial databases.

The table also distinguishes financial allocations between those that are "specific" and "supportive" (column 6). "Specific" refers to financing that contributes wholly (100 percent) to food security and nutrition. "Supportive" refers to financing that only partially contributes to food security and nutrition; therefore, a weight is applied to account for the percentage allocation that contributes to food security and nutrition. The weight rule applied is 22 percent. See **Section S3.1** for a full discussion of the definition of "specific" and "supportive" and the estimation of supportive weights. »

TABLE S3.2 NEW FINANCING FOR FOOD SECURITY AND NUTRITION DEFINITION: FOUR-LEVEL MAPPING CLASSIFICATION

Level 1	Level 2	Level 3	Level 4
Core and extended definitions	▸ **Food consumption** and **health status** ▸ **Major drivers** (conflict, climate variability and extremes, economic slowdowns and downturns) **and underlying structural factors** (lack of access to and unaffordability of nutritious foods, unhealthy food environments, and high and persistent inequality)	▸ **Food security dimensions** (food availability, access, utilization, and stability) ▸ **Nutrition determinants** (practices, and health services and environmental health) ▸ **Six transformation pathways** (related to the major drivers and underlying structural factors)	**Intervention areas related to level 3 definitions**
Core definition (financing to address the main determinants of food security and nutrition)	**Food consumption**	**Food availability**	Domestic production
			Import capacity
			Food stocks
			Food aid
		Food access	Poverty
			Affordability
			Markets
			Inequality
		Food utilization	Food preferences
			Food storage and safety
			Water access
		Food stability	Food stability
	Health status	**Practices**	Food preparation and handling
			Infant and young feeding practices
			Health-seeking behaviour
			Intra-household resource allocation
			Care for girls and women
		Health services and environmental health	Immunization
			Water and sanitation
			Availability and affordability of and access to health services
Extended definition (financing to address the major drivers and structural underlying factors)	**Conflict**	**Pathway 1: Integrating humanitarian, development and peacebuilding policies in conflict-affected areas**	Conflict-sensitive policies
			Livelihood support
			Nutrition-sensitive social protection
			Community-based approaches
			Resilience-building programmes

TABLE S3.2 (Continued)

Level 1	Level 2	Level 3	Level 4
	Climate variability and extremes	**Pathway 2: Scaling up climate resilience across agrifood systems**	Climate risk monitoring
			Early warning systems
			Climate risk insurance
			Climate-smart agriculture
			Landscape restoration
			Sustainable water management
	Economic slowdowns and downturns	**Pathway 3: Strengthening economic resilience of the most vulnerable to economic adversity**	Social protection
			Cash/In-kind transfers
			Employment creation
			Strengthening market linkages
	Lack of access to and unaffordability of nutritious foods and unhealthy food environments	**Pathway 4: Intervening along the agrifood supply chains to lower the cost of nutritious foods**	Nutrition-sensitive agricultural production and productivity
			Nutrition-sensitive value chains
			Reduce nutritious food loss and waste
			Nutrition-sensitive food handling and processing
			Urban and peri-urban agriculture
			Food fortification
			Subsidization of nutritious foods
		Pathway 5: Shifting food environments towards healthier dietary patterns with positive impact on human health	Healthy public food procurement
			Nutrition-oriented trade standards
			Food labelling
			Food reformulation
			Regulation of food marketing
	High and persistent inequality	**Pathway 6: Tackling structural inequalities, ensuring interventions are pro-poor and inclusive**	Women's empowerment
			Youth inclusion
			Equitable access to productive resources and assets
			Access to essential services
			Fiscal reform to improve income distribution

NOTE: Four-level classification based on the new definition of financing for food security and nutrition presented in this report, see Figure 15, Figure 16, Figure 19 and Box 7 of the main report.
SOURCE: Authors' (FAO) own elaboration.

TABLE S3.3 NEW DEFINITION OF FINANCING FOR FOOD SECURITY AND NUTRITION: MAPPING OF KEYWORDS TO FOUR-LEVEL CLASSIFICATION AND IDENTIFICATION OF SPECIFIC AND SUPPORTIVE INDICATORS, AND CORRESPONDING WEIGHTS

Position in the definition diagram				Search keywords	Specific or supportive	Search keywords: comments	Weighting to apply to supportive expenditure
Core or extended (level 1)	Main determinant or major driver (level 2)	Elements of determinants or pathway (level 3)	Subdeterminant or intervention description (level 4)				
CORE DEFINITION							
Core	**Food consumption**						
		Food availability					
			Domestic production	Access to credit, **agricultural cooperatives, agricultural development, agricultural education/training, agricultural extension**, agricultural income increase, **agricultural inputs**, agricultural land development, **agricultural land resources, agricultural policy and administrative management**, agricultural modernization, **agricultural research, agricultural services, agricultural water resources**, agriculture family, agriculture mechanical equipment, agriculture support programme, **agro-industries**, bio fortified food, biofortification, biofortified crops, boost production, commercial farming, community agriculture, competitive local food production system, development of irrigation, ensure local production, facilitating agricultural reform, family farm, family farming, family producer, farm development, farm income, **fertilizer minerals, fertilizer plants, fishery development, fishery education/training, fishery research, fishing policy and administrative management, food crop production**, improve agriculture irrigation, improve the competitiveness of agriculture, improved food production, increase food production, increase local food production, increasing agricultural production, irrigation, land governance, land reclamation, loans to entrepreneurs in the agricultural sector, **livestock, livestock/veterinary services**, mountain breeder, out grower schemes, **plant protection and pest control**, precision agriculture, precision farming, small breeder, small farmer, small producer, small scale farmer, small scale producer, smallholder, smallholder farmer, smallholder producer, smart agriculture, smart farming, strengthen local production, teach farmers, vertical agriculture, vertical farming, pastoralist.	Specific		
				Coal, coal-fired electric power plants, electric mobility infrastructures, electric power transmission and distribution (centralised grids), electric power transmission and distribution (isolated mini-grids), energy generation non-renewable sources, energy conservation and demand-side efficiency, energy education/training, energy generation renewable sources- multiple technologies, energy generation non-renewable sources unspecified, energy policy and administrative management, energy research, fossil fuel electric power plants with carbon capture and storage, heat plants, natural gas-fired electric power plants, non-renewable waste-fired electric power plants, oil-fired electric power plants, renewable energy, **retail distribution of liquid or solid fossil fuels, retail gas distribution**, rural electric, rural infrastructure, sustainable energy, **fuelwood/charcoal**.	Supportive	Place here energy.	22%

TABLE S3.3 (Continued)

Position in the definition diagram				Search keywords	Specific or supportive	Search keywords: comments	Weighting to apply to supportive expenditure
Core or extended (level 1)	Main determinant or major driver (level 2)	Elements of determinants or pathway (level 3)	Subdeterminant or intervention description (level 4)				
CORE DEFINITION							
			Food aid	**Food assistance**, food aid, humanitarian food assistance, distribution of food, famine relief, food aid package, emergency food assistance, food donations, food stamps, food distribution, **emergency food assistance**.	Specific		
			Food stocks	Food reserve, stock of food, food reserves, strategic grain reserve, food silo.	Specific	Place here only national food reserves.	
			Import capacity	**Import support (commodities)**, trade agreements, trade arrangements, trade barriers, trade practices, trade restrictions, trade standard, trading partners, foreign exchange reserves, port infrastructure.	Supportive		22%
		Food access					
			Poverty	Poverty reduction, **rural development**, improve livelihoods, food poverty, food-specific social protection, school children, school environment, **school feeding**, school lunch, school meal, school-based feeding programmes.	Specific	See Table S3.4, Mapping decision rules.	
			Affordability	Economic access to food, affordability of food, affordable food, transparent price, food price reduction, food price support, food subsidies, food price support. **Food security policy and administrative management, household food security programmes**.	Specific		
			Markets	Agricultural market standards, commercialization of food, food distribution centre, effective food distribution network, favourable agri-business, food fairs in cities, food supply chains, food value chains, food processing, food wholesale, food retail, food trade, food deserts, food swamps, food marketing, improve linkage between food supply and consumer, improve local food processing, food and agriculture market infrastructure, food and agricultural processing facilities, reduce intermediation in food market, short food value chain, strengthen local food supply chain, strengthen local supply chain, strengthening of local food supply chain, support to agricultural value chain, valuation of agricultural products, value-added food processing, value of horticultural outputs, food market functionality, food price volatility, food price anomalies, physical access to food, **agriculture alternative development, agricultural financial services, fishery services**.	Specific		
				Financial policy and administrative development, access road, building required infrastructure, create infrastructure, development of infrastructure, electricity distribution, electrification, ensure the construction and rehabilitation of communication route,	Supportive		22%

TABLE S3.3 (Continued)

Position in the definition diagram				Search keywords	Specific or supportive	Search keywords: comments	Weighting to apply to supportive expenditure
Core or extended (level 1)	Main determinant or major driver (level 2)	Elements of determinants or pathway (level 3)	Subdeterminant or intervention description (level 4)				
CORE DEFINITION							
				improve infrastructure, improve secondary and tertiary access road, improving infrastructure, **information and communication technology**, infrastructure along the food value chain, infrastructure development, infrastructure improvement, infrastructure innovation, infrastructure projects, infrastructure resilient, investment in infrastructure, logistic and infrastructure, provision of infrastructure, railway, **rail transport**, rehabilitate the road network, **road transport**, road infrastructure, rural road, **telecommunications**, transport facility, **water transport, transport policy and administrative management**.			
			Inequality			Place any content under Pathway 6. See Table S3.4, Mapping decision rules.	
		Food utilization					
			Food preference	Nutritional counselling, nutritional education, recommended dietary intake, dietary guideline.	Specific	See Table S3.4, Mapping decision rules.	
			Food storage and safety	**Storage**, crop loss, **education and training in transport and storage**, food is never waste, food loss, food safe, food safety, **food safety and quality**, food storage facility, food wastage, food waste, food loss and waste, losses and waste, reduced food waste, reducing food wastage, reducing food waste, safe food, post-harvest, postharvest, post-harvest, post-harvest loss, post-harvesting, **storage**, food storage infrastructure, crop and food storage loss, strengthen the construction of grain storage, crop waste and loss, food waste disposal, food waste management, food waste production, food waste recovery program, food waste reduction, wasteful food consumption, food contamination, safe food handling and preparation, food safety hazard, food safety risk, food safety management system, food safety standards, food safety regulations, food distribution system, national food control systems.	Specific		
			Water access	**Basic drinking water**, potable water, drinking water supply.	Specific	See Table S3.4, Mapping decision rules.	

TABLE S3.3 (Continued)

Position in the definition diagram				Search keywords	Specific or supportive	Search keywords: comments	Weighting to apply to supportive expenditure
Core or extended (level 1)	Main determinant or major driver (level 2)	Elements of determinants or pathway (level 3)	Subdeterminant or intervention description (level 4)				
CORE DEFINITION							
		Food stability					
			Food stability			Major drivers of instability in the three dimensions of food security are identified and addressed in Pathways 1, 2 and 3.	
	Health status						
		Practices					
			Food preparation and handling			Place any content here on food preparation and handling.	
			Infant and young feeding practices	Balanced energy-protein supplementation, calcium supplementation, child mortality, complementary foods, food and condiment fortification, food fortification, food supplement, fortification of food, fortified food, fortified nutrient, human milk, immediate initiation of breastfeeding, infant and young child nutrition counselling, infant and young child feeding education, iron and folic acid fortification, iron and folic acid supplementation, lactating women, lipid-based nutrition supplements, micronutrient deficiency, micronutrient fortification, micronutrient supplementation, maternal and child health, national breastfeeding promotion campaigns, exclusive breastfeeding promotion, nutrition assistance, nutrient fortification, nutrition awareness, nutrition education, nutrition fortification, nutrition information, **basic nutrition**, nutrition label, nutrition literacy, nutritional information, oral rehydration solution, pro-breastfeeding social policies, prophylactic zinc supplementation, pregnant women, public provision of complementary foods stunting, staple food fortification, supplementary feeding, supplementary food, under-five mortality rate, vitamin A supplementation.	Specific		
			Health-seeking behaviour			Place any content here on health-seeking behaviour.	
			Intra-household resource allocation			Place any content here on intra-household resource allocation.	

TABLE S3.3 (Continued)

Position in the definition diagram				Search keywords	Specific or supportive	Search keywords: comments	Weighting to apply to supportive expenditure
Core or extended (level 1)	Main determinant or major driver (level 2)	Elements of determinants or pathway (level 3)	Subdeterminant or intervention description (level 4)				
CORE DEFINITION							
			Care for girls and women			Place any content here on care for girls and women.	
		Health services and environmental health					
			Availability and affordability of and access to health services	**Basic health care, basic health infrastructure**, health services, **health education, health personnel development, health policy and administrative management**, universal health coverage, health services, **infectious disease control, medical education/training, medical research, medical services, multisector aid for basic social services, NCDs control, other prevention and treatment of NCDs, promotion of mental health and well-being, research for prevention and control of NCDs, social mitigation of HIV/AIDS, tobacco use control, control of harmful use of alcohol, pharmaceutical production**.	Supportive		22%
				Treatment of severe acute malnutrition, delayed umbilical cord clamping.	Specific		
			Immunization	**COVID-19 control, malaria control**, intermittent preventative treatment of malaria, **tuberculosis control**, long-lasting insecticide-treated bed nets.	Supportive		22%
			Water and sanitation	Safe water, clean water, distribution of fresh water, **basic drinking water supply and basic sanitation, basic sanitation, education and training in water supply and sanitation**, hygiene assistance, sanitation, **sanitation – large systems**, sewage, **waste management/disposal**, wastewater, **water resources conservation (including data collection)**, water sanitation, **water supply and sanitation – large systems**.	Specific	Include here all WASH except drinking/cooking water quantity (but including quality) and irrigation water. See Table S3.4, Mapping decision rules.	
				Water sector policy and administrative management, water security, **water supply – large systems, river basin development**.	Supportive		22%

TABLE S3.3 (Continued)

Position in the definition diagram				Search keywords	Specific or supportive	Search keywords: comments	Weighting to apply to supportive expenditure
Core or extended (level 1)	Main determinant or major driver (level 2)	Elements of determinants or pathway (level 3)	Subdeterminant or intervention description (level 4)				
EXTENDED DEFINITION							
	Conflict						
		Pathway 1. Integrating humanitarian development and peacebuilding policies in conflict-affected areas	Conflict-sensitive policies Livelihood support Nutrition-sensitive social protection Community-based approaches Resilience-building programmes	In conflict, post-conflict, protracted crisis settings specifically: peacebuilding efforts linked to livelihood support, nutrition-sensitive social protection and food production and supply programs, maintaining key functions of food supply chains, community-based approaches in post-conflict policies, nutrition-sensitive transfer, nutrition-sensitive food assistance.	Specific	Restrict these keywords to conflict, post-conflict and protracted crisis situations only.	
				Armed conflict, armed violence, asylum seekers, **child soldiers (prevention and demobilisation), civilian peace-building, conflict prevention and resolution**, post-conflict recovery, community-based approach in conflict, post-conflict settings, protracted crisis settings, conflict, conflict mitigation, conflict prevention, conflict prone region, conflict reconciliation, conflict reduction, conflict resilience, conflict sensitive, conflict transformation, contributions to sustaining peace, investing in peace, food crisis in conflict, post-conflict and protracted crisis settings, food supply crisis in conflict, post-conflict and protracted crisis settings, genocide, **material relief assistance and services, participation in international peacekeeping operations, refugees/asylum seekers in donor countries (non-sector allocable), reintegration and SALW control, relief co-ordination and support services, removal of land mines and explosive remnants of war, security system management and reform, facilitation of orderly, safe, regular and responsible migration and mobility, immediate post-emergency reconstruction and rehabilitation** in post-conflict, and protracted crisis settings.	Supportive	Restrict these keywords to conflict, post-conflict, and protracted crisis situations.	22%
	Climate variability and extremes						
		Pathway 2. Scaling up climate resilience across agrifood systems	Climate risk monitoring Early warning system Climate risk insurance Climate-smart agriculture Landscape restoration Sustainable water management	Agricultural insurance, agri-insurance, climate risk monitoring, early warning systems, farm insurance, agriculture-based climate insurance, agricultural insurance scheme, index-based climate insurance, weather-index insurance, drought-index insurance, parametric agricultural insurance, climate-smart agriculture, climate adaptation in agriculture, climate food program, agroecology.	Specific		

TABLE S3.3 (Continued)

Position in the definition diagram				Search keywords	Specific or supportive	Search keywords: comments	Weighting to apply to supportive expenditure
Core or extended (level 1)	Main determinant or major driver (level 2)	Elements of determinants or pathway (level 3)	Subdeterminant or intervention description (level 4)				
EXTENDED DEFINITION							
				Biodiversity, biosphere protection, carbon footprint, carbon neutral, carbon sequestration, changing climate, changing environmental condition, climate resilience, climate action, climate adaptation, climate change, climate goals, climate impact, climate information, climate insurance, climate monitoring, climate phenomena, climate resilience, climate resilient, climate risk, climate service, climate variability, **disaster risk reduction**, disaster risk management, disaster risk reduction, **environmental education/training, environmental policy and administrative management, environmental research, forestry development, forestry education/training, forestry policy and administrative management, forestry research, forestry services, forestry development**, landscape restoration, manage natural resources, management of water, **multi-hazard response preparedness**, natural disaster, natural resources management, protection of agricultural land, restore land, **site preservation**, soil erosion prevention, **energy generation renewable energy**, hydro plants, hydro energy, **hydro-electric power plants, solar energy for centralised grids, solar energy for isolated grids and standalone systems, solar energy – thermal applications, wind energy, marine energy, geothermal energy, biofuel-fired power plants, hybrid energy electric power plants, nuclear energy electric power plants and nuclear safety**.	Supportive		22%
	Economic slowdowns and downturns						
		Pathway 3. Strengthening economic resilience of the most vulnerable to economic adversity	Social protection Cash/in-kind transfers Employment creation Strengthening market linkages	Additional income, agro-tourism, **basic metal industries, non-ferrous metal industries**, building capacity of local community, **business development services, business policy and administration**, cash transfers, cash-for-work, **cement/lime/plaster, chemicals**, commercialization network, competitive value chain, **cottage industries and handicraft**, create job, create sustainable job, developing market, diversification of income source, economic empowerment, economic resilience, economic shock, employment, **employment creation**, employment have been generated, employment opportunity, **energy manufacturing (fossil fuels), engineering**, enhanced economic activities, facilitate processing, energy manufacturing (fossil fuels), engineering, income-generating, increase employability, **forest industries**, increased employment, **industrial crops/export crops industrial development, industrial policy and administrative management**, job creation, market-linked innovation, **multilateral trade negotiations, non-agricultural alternative development, regional trade agreements (RTAs), remittance facilitation, promotion and optimization, responsible business conduct**, self-employment, **small and medium-sized enterprises (SME) development**, social assistance, social safety net, in-kind transfer, sources of income, strengthen workplace skills,	Supportive		22%

TABLE S3.3 (Continued)

Position in the definition diagram				Search keywords	Specific or supportive	Search keywords: comments	Weighting to apply to supportive expenditure
Core or extended (level 1)	Main determinant or major driver (level 2)	Elements of determinants or pathway (level 3)	Subdeterminant or intervention description (level 4)				
EXTENDED DEFINITION							
				strengthening market linkages, support for socially vulnerable group, systemic competitiveness, **technological research and development, textiles, leather and substitutes, trade education/training, trade facilitation, trade policy and administrative management, trade-related adjustment, transport equipment industry**, value addition facility, value chain development, value chain more resilient, raise producer income, public food procurement.			
	Lack of access to and unaffordability of nutritious foods and unhealthy food environments						
		Pathway 4. Intervening along the agrifood supply chains to lower the cost of nutritious foods	Nutrition-sensitive agricultural production and productivity Nutrition-sensitive value chains Reduction of food loss and waste Nutrition-sensitive food handling and processing Urban and peri-urban agriculture Food fortification Subsidization of nutritious foods	Affordability of healthy diets, affordability of a healthy diet, affordable nutritious foods, lower nutritious food prices, lower cost of nutritious foods, fair nutritious food price, nutrient dense food, nutrient rich food, nutrient-dense food, nutrient-rich food, nutritive food, vegetable production, fruit production, legume production, pulse production, vegetable farm, fruits and vegetables, perishable foods, nutritious foods, increase nutritious foods availability, improved cold chains, efficient cold-chains, cold chain infrastructure, developing the cold chain.	Specific	See Table S3.4, Mapping decision rules.	
		Pathway 5. Shifting food environments towards healthier dietary patterns with positive impact on human health	Healthy public food procurement Nutrition-oriented trade standards Food labelling Food reformulation Regulation of food marketing	Breast milk substitutes, consume sustainably, consumer protection, diet quality, dietary guideline, dietary guideline, dietary recommendation, food label, food labelling, food reformulation, food reformulations, from farm to school, front-of-package label, front-of-package labelling , healthy public food procurement, highly processed food, nutritional labelling, healthy public food procurement, shifting to nutritious diet, ultra-processed food, unhealthy diet, unhealthy food, nutrition-oriented trade standards, protect children from harmful food marketing, regulated food marketing, food standards, reduce food salt/sodium, reduce food fat content, reduce food sugar content, eliminate industrial trans-fat, nutritious dietary patterns, healthy diet patterns, dietary diversification, dietary diversity, dietary pattern, dietary structure, diverse diet, diversified diet, food diet, healthy diets, nutritious foods, healthier diet, healthy and sustainable, healthy consumption, nutritional counselling, nutritional education, recommended dietary intake, subsidies on nutritious foods, subsidies for healthy options.	Specific	See Table S3.4, Mapping decision rules.	

TABLE S3.3 (Continued)

Position in the definition diagram				Search keywords	Specific or supportive	Search keywords: comments	Weighting to apply to supportive expenditure
Core or extended (level 1)	Main determinant or major driver (level 2)	Elements of determinants or pathway (level 3)	Subdeterminant or intervention description (level 4)				
EXTENDED DEFINITION							
	High and persistent inequality						
		Pathway 6. Tackling structural inequalities ensuring interventions are pro-poor and inclusive	Women's empowerment	Access to agricultural land, **agrarian reform**, land reform, land tenure security, right to land, women empowerment, inclusive growth, equitable access.	Specific		
			Youth inclusion				
			Equitable access to productive resources and assets	**Early childhood education, education facilities and training, education policy and administrative management, higher education, lower secondary education, primary education, primary education equivalent for adults, teacher training**, equitable access to education, minimum income.	Supportive		
			Access to essential services	Access to assets, access to productive resources, **advanced technical and managerial training, basic life skills for youth and adults, basic life skills for youth**, community-driven development, community empowerment, control of economic resources, cooperative development, co-operative development, **culture and recreation**, decent employment, decent job, decent work, disadvantaged young people, disadvantaged youth, **domestic revenue mobilisation, education/training in banking and financial services, educational research, ending violence against women and girls**, equitable access, essential services, families empower and support, **family planning**, female, female farmer, female worker, gender, girl, higher income, **housing policy and administrative management**, inclusive labour markets, income distribution, income redistribution, labour law, labour rights, labour law, labour legislation, **labour rights**, labour standards, **low-cost housing**, mother, **multisector education/training, personnel development for population and reproductive health, population policy and administrative management**, pro-poor, **reproductive health care**, reproductive rights, rural livelihood, rural poverty, safe motherhood, **social dialogue**, status of agricultural workers, **STD control including HIV/AIDS**, structural inequality, underprivileged young people, **upper secondary education (modified and includes data from 11322), urban development and management**, urban inequality, **vocational training**, vulnerable community, vulnerable group, wage rate, minimum wage, woman, women, women empowerment, women rights, women's rights, **women's rights organisations and movements, and government institutions**, working condition, young people, young person, youth, youth inclusion, financial inclusion, **human rights, democratic participation and civil society, debt forgiveness, relief of multilateral debt, rescheduling and refinancing, debt for development swaps, other debt swaps, debt buy-back**.	Supportive	See Table S3.4, Mapping decision rules.	22%
			Fiscal reform to improve income distribution				

NOTE: NCD = non-communicable disease; SALW = small arms and light weapons; STD = sexually transmitted disease; WASH = water, sanitation and hygiene.
SOURCE: Authors' (FAO) own elaboration.

TABLE S3.4 NEW DEFINITION OF FINANCING FOR FOOD SECURITY AND NUTRITION: MAPPING DECISION RULES

A. Guidance in the application of the new financing for food security and nutrition definition

- To avoid overlaps and double-counting of financial allocations when applying the four-level mapping classification of the new definition of financing for food security and nutrition, a set of decision rules on some specific elements is required.

B. Mapping decision rules

Decision rules

1. Issues of overlaps between the "food utilization" dimension of food security and the "practices" and "health services and environmental health" elements of health status (see Chapter 3, Figure 15 of the main report)

- "Food utilization" is one of the core pillars of food security and usually refers to factors of food preferences, preparation, storage and access to an adequate quantity and quality of water, and caring practices.
- When analysing food security and nutrition, which requires a combined conceptual and analytical framework, there is an apparent or potential overlap with food preparation, caring and feeding practices, and water – between the "food utilization" dimension of food security and the nutrition-defined determinants of health status, "practices" and "health services and environmental health".
- ***The State of Food Security and Nutrition in the World* decision rule** for avoiding potential overlaps is to adopt and slightly adapt the definition and allocation, similarly but not the same, as applied in the Integrated Food Security Phase Classification (IPC) Integrated Food Security and Nutrition Conceptual Framework[28] and its application.
- **Specifically, to avoid overlaps in food preparation and caring practices:**
  - "Food utilization" only refers to food preferences, food storage and safety, and water access.
  - "Practices" in health status include food preparation and handling, infant and young feeding practices, health-seeking behaviour, intra-household resource allocation, and care for girls and women.
- **Specifically, to avoid overlaps in water access and, water and sanitation:**
  - Water, sanitation and hygiene (WASH) interventions are in the health status determinant "health services and environmental health." This determinant relates to individual consumption and quality of water (water safety).
  - Food Security level interventions include sufficient quantities of water related to irrigation for crops and water for livestock (food production), access to sufficient quantities of water to drink (food access), and water for food preparation (food utilization).

2. Issues of overlaps within Food access related to affordability, income and poverty

- For "affordability" (level 4 of food access), the keywords related to the income side of affordability are not included, only general keywords on food affordability and food price. Income-related keywords are included in "poverty" (level 4 of food access).
- "Poverty" (level 4 of food access) does not include income distribution and inequality. These are instead allocated to **Pathway 6** in the extended definition, while anything having to do with income inequality goes in the extended definition, to avoid overlaps.

3. Issue of where to include healthy diets – in core and extended or both

Healthy diets

- The availability and affordability of and access to healthy diets was introduced as an underlying structural factor of food insecurity and malnutrition in *The State of Food Security and Nutrition in the World 2020*,[29] and since 2020, *The State of Food Security and Nutrition in the World* reports have strongly advocated policy, actions and investments in healthy diets in all reports[30–32] as necessary to meet Sustainable Development Goal Targets 2.1 and 2.2.
- Two of the pathways are dedicated to improving access to and affordability of healthy diets (**Pathway 4**) and shifting food environments towards healthier dietary patterns (**Pathway 5**).
- ***The State of Food Security and Nutrition in the World* decision rule:**
  - Defined only within the extended definition, and not in the core definition.
  - **Pathway 4 consists entirely of allocations related to reducing the cost of nutritious foods and improving the affordability of healthy diets.** It includes interventions, along agrifood supply chains, from production, distribution and processing, to markets, **with a specific focus on nutritious foods**. Nutritious foods include vegetables and fruits, which are the largest cost component of a healthy diet and are insufficiently available in almost every region in the world to meet a Healthy Diet Basket.
  - **Pathway 5 consists entirely of allocations related to promoting healthy food environments**. It includes promoting changes in food consumption behaviour towards healthy dietary patterns, through measures such as healthy public food procurement, nutrition-oriented trade standards, food labelling and reformulation, and regulation of food marketing.

4. Issue of social protection

Decision rule:

- **Food-specific social protection** is allocated to the **core definition**, whether food aid under food availability (e.g. food assistance), affordability (specific case of food subsidies, which are oriented to lower food prices) or poverty under food access (e.g. school feeding).
- **Non-food social protection** is allocated to **Pathway 3** (e.g. cash transfers).

SOURCE: Authors' (FAO) own elaboration.

S3.3 Countries affected by major drivers: list of countries, methodology and data sources

The analysis of "countries affected by major drivers" (i.e. conflict, climate extremes and economic downturns) applies a risk–hazard–vulnerability–capacity analytical framework:

Risk of food insecurity = (hazard (H), vulnerability (V)/capacity (C)/resilience (R))

The hazard is defined as the occurrence of the driver (e.g. a climate extreme), and vulnerability is defined as a country's vulnerability (to food insecurity) as a result of exposure to the driver event. The variables used to detect the occurrence of the hazard and identify the degree of vulnerability are specifically identified and analysed for each individual driver based on the nature of the driver, the conceptual understanding of the determinants of food security, and evidenced analysis of the impact of the driver on these determinants.

TABLE S3.5 COUNTRIES AFFECTED BY COMBINATION OF MAJOR DRIVERS: METHODOLOGIES AND DATA SOURCES

The State of Food Security and Nutrition in the World 2021	*The State of Food Security and Nutrition in the World 2024*
Time frame – exposure to drivers	
Conflict 2000–2019, with four 5-year windows: 1. 2000–2004 2. 2005–2009 3. 2010–2014 4. 2015–2019 Climate extremes 2000–2020, with three 5-year windows and one 6-year window: 1. 2000–2004 2. 2005–2009 3. 2010–2014 4. 2015–2020 Economic downturns 2011–2021 Inequality 2001–2018, two 5-year windows, one 6-year window and one 2-year window: 1. 2001–2005 2. 2006–2010 3. 2011–2016 4. 2017–2018	2003–2022, with four 5-year windows: 1. 2003–2007 2. 2008–2012 3. 2013–2017 4. 2018–2022
Time frame – countries affected by drivers	
2010–2019	2013–2022
Country coverage – countries affected by drivers	
The analysis in **Chapter 3** of the main report is focused on 133 low- and middle-income countries and territories for which relevant information on the key drivers of food insecurity is available. Following the latest World Bank classification of income, of the 133 countries, 29 are low income, 50 are lower-middle income and 54 are upper-middle income. Of the 133 countries, 110 low- and middle-income countries have information on the PoU for years 2010–2019.	The analysis in **Chapter 3** of the main report is focused on low- and middle-income countries and territories for which relevant information on the key drivers of food insecurity and the PoU is available. Following the World Bank classification of income for 2022 of the 135 countries, 26 are low income, 54 are lower-middle income and 55 are upper-middle income. Of the 135 countries, 119 low- and middle-income countries have information on the PoU and will be used for the analysis in **Chapter 3** of the main report.
Countries affected by conflict	
Definition	
Refers to low- and middle-income countries and territories affected by conflict for at least one subperiod of 5 consecutive years and having suffered 500 or more battle deaths during that subperiod. The time frame spans from 2000 to 2019, with four periods of 5 years: 2000–2004; 2005–2009; 2010–2014; 2015–2019. Based on *The State of Food Security and Nutrition in the World 2021*[31] Table A4.1, of the 110 low- and middle-income countries with PoU data available, there are 32 low- and middle-income countries that meet these criteria.	Refers to low- and middle-income countries and territories affected by conflict for at least one subperiod of 5 consecutive years and having suffered 500 or more battle deaths during that subperiod. The time frame spans from 2013 to 2022, with two periods of 5 years: 2013–2017; 2018–2022. Only countries with PoU data available are considered. Of the 119 low- and middle-income countries with PoU data available, 35 are affected by conflict.

TABLE S3.5 (Continued)

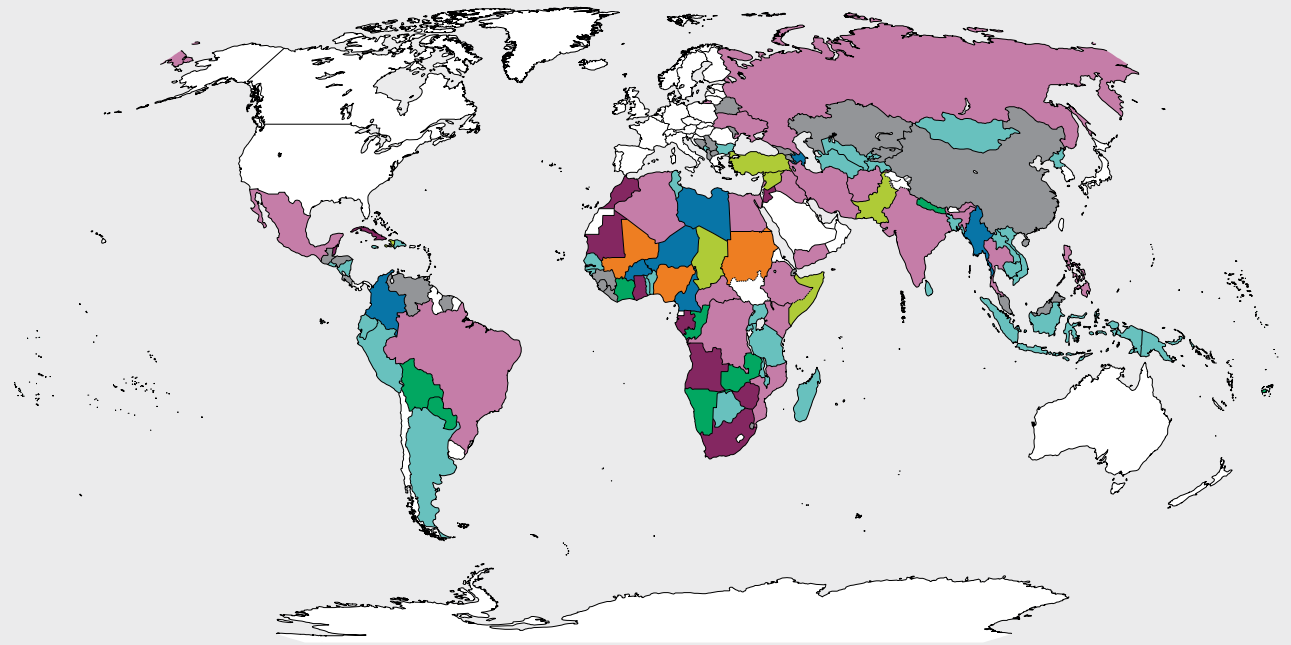
The State of Food Security and Nutrition in the World 2021	*The State of Food Security and Nutrition in the World 2024*
Data sources	
Uppsala University. 2021. *UCDP: Uppsala Conflict Data Program*. [Accessed on 26 May 2021]. https://ucdp.uu.se	Uppsala Conflict Data Program (UCDP) georeferenced event dataset version 23.1[33, 34] and UCDP battle-related deaths dataset version 22.1.[35]
Countries affected by climate extremes	
Definition	
Refers to low- and middle-income countries that experience a combination of **high exposure** to climate extremes (i.e. drought, flood, heat spell, storm) and **vulnerability** to climate factors. **High exposure** is defined as the situation when a country experiences three or four different typologies of climate extremes during the two subperiods of 2010–2014 or 2015–2019 or, alternatively, when extremes occur for at least 7 years in 2010–2019. ▸ **Exposure to heat spells** is defined as the percentage of days when the daily temperature that is higher than the 90th percentile (TX90p) exceeds the long-term mean percentage average (1981–2017) plus one annual standard deviation in a given year/country. ▸ **Exposure to flood** is defined as when rainfall over agricultural cropping areas in a given country/year is greater than two standard deviations above the long-term rainfall average (1981–2017) in the country. ▸ **Exposure to storm** is defined as when in a given country/year storms have occured. ▸ **Exposure to drought** is defined in two different ways: i) based on precipitation for years 1996–2005, and ii) based on the Anomaly hot Spots of Agriculture Production (ASAP) frequency of drought conditions for years 2006–2016. Exposure to drought is defined as when: i) rainfall in a given country/year over agricultural cropping areas is lower than one standard deviation with respect to the long-term rainfall average, or when ii) the ASAP system indicates drought conditions occurring for more than 15 percent of the growing season of croplands or rangelands in a given country/year. Although ASAP is considered to provide a more accurate measure of drought, it has only been available since 2006. Several robustness checks were performed and confirm the validity of using both ASAP and precipitation for the earlier period to identify exposure to drought. Climate-related **vulnerability** is identified when at least one of the following conditions occurs: ▸ a country shows a high and statistically significant association between cereal production or imports and at least one climate factor (temperature, precipitation and vegetation growth) during the years 2001–2020; ▸ a country is highly dependent on agriculture, measured by 60 percent or more people employed in the agriculture sector in 2019; ▸ a country shows an increasing PoU change point in correspondence with a year ranked among the first four with the most severe frequencies of drought conditions for each country. The rank is based on a 3-year average ASAP warning. Change points in the PoU time series are identified by applying the multiple structural changes model proposed by Bai and Perron (1998).[36] A minimum break interval of 2 years was imposed in the identification of the optimal segmentation. Countries with a PoU estimate missing for more than 9 years and countries with PoU estimates lower than 2 percent are excluded from the change point analysis.	Refers to low- and middle-income countries that experience a combination of **high exposure** to climate extremes (i.e. drought, flood, heat spell, storm) and **vulnerability** to climate factors. **High exposure** is defined as when a country experiences three or four different typologies of climate extremes during the two subperiods of 2013–2017 or 2018–2022 or, alternatively, when extremes occur for at least 7 years in 2013–2022. ▸ **Exposure to heat spells** is defined as the percentage of days when the daily temperature that is higher than the 90th percentile (TX90p) exceeds the long-term mean percentage average (1981–2017) plus one annual standard deviation in a given year/country. ▸ **Exposure to flood** is defined as when rainfall over agricultural cropping areas in a given country/year is greater than two standard deviations above the long-term rainfall average (1981–2017) in the country. ▸ **Exposure to storm** is defined as when in a given country/year storms have produced at least one of the following effects: i) the deaths of ten or more people; ii) 100 or more people affected/ injured/homeless; iii) declaration by the country of a state of emergency or an appeal for international assistance. ▸ **Exposure to drought** is defined when the Anomaly hot Spots of Agriculture Production (ASAP) system indicates drought conditions occurring for more than 15 percent of the growing season of croplands or rangelands in a given country/year. Climate-related **vulnerability** is identified as when at least one of the following conditions occurs: ▸ a country shows a statistically significant association between cereal production or imports and at least one climate factor (temperature, precipitation, ASAP index or Agricultural Stress Index System [ASIS]) during the years 2003–2022. For this aim, production and import data are detrended using Loess. The alpha parameter controlling the strength of the smoothing was determined by visual inspection of all production and import temporal trajectories and finally set to 1.0. The correlation of detrended time series with ASAP and ASIS environmental data was assessed using Spearman's rank correlation coefficient. The significance of the correlation was assessed using a significance level of 10 percent; ▸ a country is highly dependent on agriculture, measured by 60 percent or more people employed in the agriculture sector in 2022; ▸ a country shows an increasing PoU change point in correspondence with a year ranked among the first four with the most severe frequencies of drought conditions for each country and the value of ASAP warning in that year is above nine. The rank is based on yearly ASAP warnings. Change points in the PoU time series are identified by applying the multiple structural changes model proposed by Bai and Perron (1998).[36] A minimum break interval of 3 years is imposed in the identification of the optimal segmentation. Countries with PoU estimate missing for more than 9 years are excluded from the change point analysis.

TABLE S3.5 (Continued)

The State of Food Security and Nutrition in the World 2021	*The State of Food Security and Nutrition in the World 2024*
Based on *The State of Food Security and Nutrition in the World 2021*[31] Table A4.1, of the 110 low- and middle-income countries, there are 66 low- and middle-income countries that meet these criteria.	Of the 119 low- and middle-income countries with PoU data available, 68 countries are affected by climate extremes.
Data sources	
Drought information is based on the Anomaly hot Spots of Agriculture Production (ASAP). Flood information is based on the Climate Hazards Group Infrared Precipitation with Stations (CHIRPS). Heat spell information is based on the European Centre for Medium-Range Weather Forecasts (ECMWF ERA5). Storm information is based on the Centre for Research on the Epidemiology of Disasters (EM-DAT). Data on cereal production and imports are from FAO Global Information and Early Warning System on Food and Agriculture (GIEWS) Cereal Balance Sheets. Data on people employed in agriculture are from World Bank World Development Indicators.[37]	Drought information is based on the Anomaly hot Spots of Agriculture Production (ASAP). Flood information is based on the Climate Hazards Group Infrared Precipitation with Stations (CHIRPS). Heat spell information is based on the European Centre for Medium-Range Weather Forecasts (ECMWF ERA5). Storm information is based on the Centre for Research on the Epidemiology of Disasters (EM-DAT). Data on cereal production and imports are from FAOSTAT. Data on people employed in agriculture are from World Bank World Development Indicators.[37]
Countries affected by economic downturns	
Definition	
Refers to low- and middle-income countries that experience an economic downturn in 1 of the 2 years before the occurrence of an increasing PoU change point, and during the period 2010–2018. Specifically, a PoU change point characterized by an increasing tendency between *t–2* and *t+2* is identified at time *t*, and it should occur in correspondence with an economic downturn reported at time *t*, or at time *t–1*. Based on *The State of Food Security and Nutrition in the World 2021*[31] Table A4.1, of the 110 low- and middle-income countries, there are 24 low- and middle-income countries that meet these criteria.	Refers to low- and middle-income countries that experience an economic downturn in 1 of the 2 years before the occurrence of an increasing PoU change point, and during the period 2013–2022. Specifically, a PoU change point, identified at time *t*, should occur in correspondence with an economic downturn reported at time *t*, or at time *t–1*. Change points in the PoU time series are identified by applying the multiple structural changes model proposed by Bai and Perron (1998).[36] A minimum break interval of 3 years is imposed in the identification of the optimal segmentation. Countries with a PoU estimate missing for more than 9 years are excluded from the change point analysis. Of the 119 low- and middle-income countries with PoU data available, 30 countries are affected by economic downturns.
Data sources	
International Monetary Fund *World Economic Outlook* time series (April 2021) on per capita annual GDP.	GDP per capita growth (annual %) from World Bank World Development Indicators.[37]
Countries with high income inequality	
Definition	
Refers to low- and middle-income countries that report a Gini index that is higher than the median value of the income inequality distribution, given information available during years 2010–2018. Of the 110 low- and middle-income countries, there are 46 low- and middle-income countries that meet these criteria.	Refers to low- and middle-income countries that report a Gini index that is higher than the median value of the income inequality distribution, given information available during years 2013–2022. Of the 119 low- and middle-income countries with PoU data available, 60 countries are affected by high income inequality.
Data sources	
Gini index from World Development Indicators of the World Bank.[37]	Gini index from World Development Indicators of the World Bank.[37]

NOTES: PoU = prevalence of undernourishment; GDP = gross domestic product. Primary data sources are provided in the table. For full elaboration of the methodologies, see FAO *et al.* (2021).[31] For full bibliographic references relative to numbered endnotes, see the Notes in the end matter.
SOURCES: FAO, IFAD, UNICEF, WFP & WHO. 2017. *The State of Food Security and Nutrition in the World 2017. Building resilience for peace and food security.* Rome, FAO. https://openknowledge.fao.org/handle/20.500.14283/i7695en; FAO, IFAD, UNICEF, WFP & WHO. 2018. *The State of Food Security and Nutrition in the World 2018. Building climate resilience for food security and nutrition.* Rome, FAO. https://openknowledge.fao.org/handle/20.500.14283/i9553en; FAO, IFAD, UNICEF, WFP & WHO. 2019. *The State of Food Security and Nutrition in the World 2019. Safeguarding against economic slowdowns and downturns*. Rome, FAO. https://doi.org/10.4060/CA5162EN; FAO, IFAD, UNICEF, WFP & WHO. 2021. *The State of Food Security and Nutrition in the World 2021. Transforming food systems for food security, improved nutrition and affordable healthy diets for all.* Rome, FAO. https://doi.org/10.4060/cb4474en

FIGURE S3.1 COUNTRIES BY COMBINATION OF MAJOR DRIVERS OF FOOD INSECURITY AND MALNUTRITION, 2013–2022



NOTES: The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO), the International Fund for Agricultural Development (IFAD), the United Nations Children's Fund (UNICEF), the World Food Programme (WFP) and the World Health Organization (WHO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries. Dashed lines on maps represent approximate border lines for which there may not yet be full agreement. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. Final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined. See Table S3.5 for definitions and methodology of countries affected by multiple drivers. See data sources for drivers in Table S3.5.
SOURCE: Authors' (FAO) own elaboration.

https://doi.org/10.4060/cd1254en-figS3-1

» Update of countries affected by major drivers

This report provides an update of countries affected by combinations of major drivers that were provided in *The State of Food Security and Nutrition in the World 2021*[31] report. Figure S3.1 shows the global map of the updated analysis for low- and middle-income countries, and Table S3.6 provides a full list of the countries by combination of drivers. »

TABLE S3.6 LIST OF COUNTRIES BY COMBINATION OF MAJOR DRIVERS, 2013–2022

A. Countries affected by no driver (N=31)	B. Countries affected by conflict (N=7)	C. Countries affected by climate extremes (N=32)	D. Countries affected by economic downturns (N=10)
Low income	**Low income**	**Low income**	**Lower-middle income**
Liberia	Burkina Faso*	Democratic People's Republic of Korea	Bolivia (Plurinational State of)*
Sierra Leone	Niger*	Guinea-Bissau	Comoros*
Lower-middle income	**Lower-middle income**	Madagascar	Congo
Cabo Verde*	Cameroon*	Malawi*	Côte d'Ivoire*
Djibouti*	Myanmar	Rwanda*	Kiribati
Eswatini*	**Upper-middle income**	Togo*	Nepal
Guinea	Azerbaijan	Uganda*	Zambia*
Honduras*	Colombia*	**Lower-middle income**	**Upper-middle income**
Kyrgyzstan	Libya	Bangladesh	Fiji
Samoa*		Benin*	Namibia*
Sao Tome and Principe*		Cambodia	Paraguay*
Solomon Islands		Lao People's Democratic Republic*	
Timor-Leste		Mongolia	
Vanuatu		Nicaragua*	
Upper-middle income		Papua New Guinea	
Albania		Senegal*	
Armenia		Sri Lanka*	
Belarus		Tajikistan	
Bosnia and Herzegovina		Tunisia	
China*		United Republic of Tanzania*	
Costa Rica*		Uzbekistan	
Dominica		Viet Nam*	
Georgia		**Upper-middle income**	
Guatemala*		Argentina*	
Kazakhstan		Botswana*	
Malaysia*		Bulgaria*	
Mauritius*		Dominican Republic*	
North Macedonia		Ecuador*	
Republic of Moldova		El Salvador*	
Saint Vincent and the Grenadines		Indonesia*	
Serbia		Jamaica	
Suriname		Montenegro*	
Venezuela (Bolivarian Republic of)		Peru*	
		Turkmenistan	

TABLE S3.6 (Continued)

E. Countries affected by conflict and climate extremes (N=19)	F. Countries affected by conflict and economic downturns (N=3)	G. Countries affected by climate extremes and economic downturns (N=11)	H. Countries affected by conflict, climate extremes and economic downturns (N=6)
Low income	**Low income**	**Low income**	**Low income**
Afghanistan	Mali*	Gambia*	Chad*
Central African Republic*	Sudan	**Lower-middle income**	Somalia
Democratic Republic of the Congo	**Lower-middle income**	Angola*	Syrian Arab Republic
Ethiopia	Nigeria	Ghana*	**Lower-middle income**
Mozambique*		Jordan	Haiti
Yemen*		Mauritania	Pakistan
Lower-middle income		Morocco*	**Upper-middle income**
Algeria		Zimbabwe*	Türkiye*
Egypt		**Upper-middle income**	
India		Belize	
Iran (Islamic Republic of)*		Cuba	
Kenya*		Gabon*	
Lebanon		South Africa*	
Philippines*			
Ukraine			
Upper-middle income			
Brazil*			
Iraq			
Mexico*			
Russian Federation*			
Thailand			

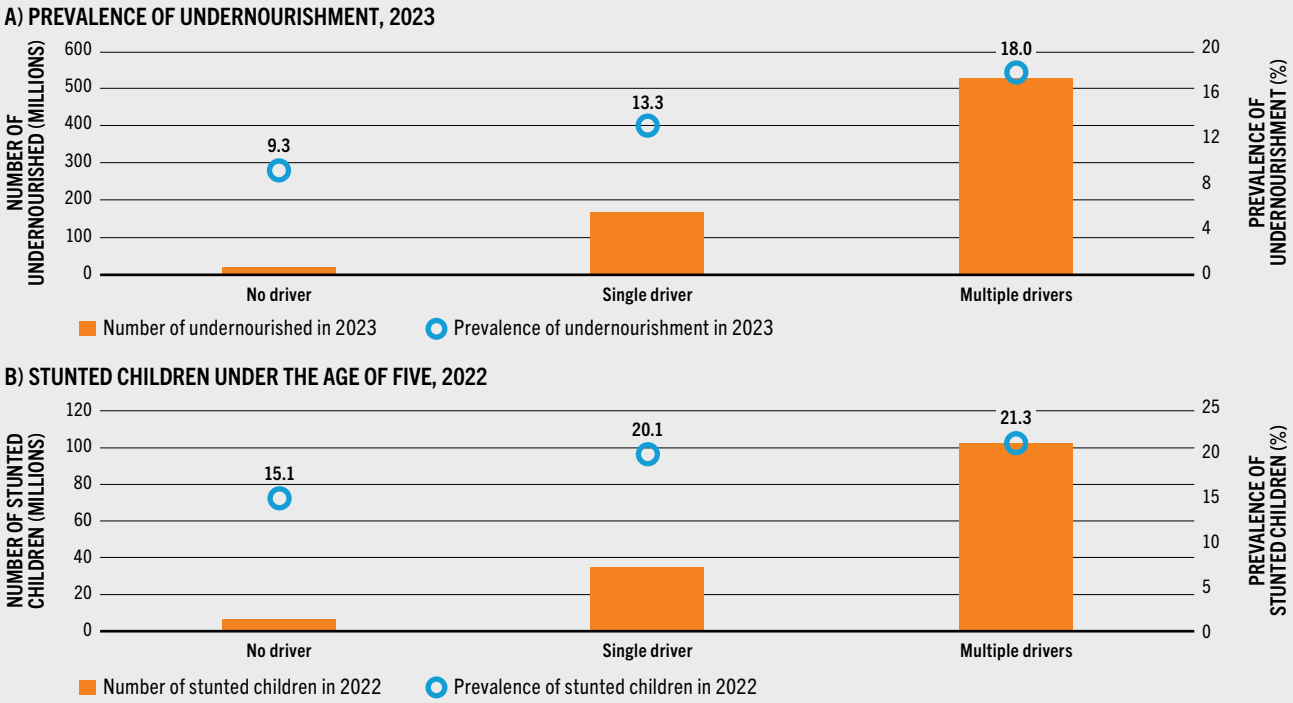
NOTES: The table shows the list of 119 low- and middle-income countries with information on prevalence of undernourishment that are affected by different combinations of major drivers (conflict, climate extremes and economic downturns). Yellow highlighting denotes low-income food-deficit countries, while the asterisk (*) denotes countries with high income inequality. See Table S3.5 for definitions and methodology of countries affected by multiple drivers.
SOURCES: Authors' (FAO) own elaboration based on FAO. 2024. Low-Income Food-Deficit Countries (LIFDCs) – List updated June 2023. In: *FAO*. [Cited 6 June 2024]. https://www.fao.org/countryprofiles/lifdc for the classification of low-income food-deficit countries; World Bank. 2022. World Development Indicators. In: *World Bank*. [Cited 31 October 2023]. https://datatopics.worldbank.org/world-development-indicators for country income group data. See Table S3.5 for data sources on drivers.

TABLE S3.7 COUNTRIES AFFECTED BY THE MAJOR DRIVERS

Countries affected by major driver(s) of food insecurity and malnutrition (descending order by PoU)	Total number of countries	Percentage of the population unable to afford a healthy diet	Number of countries with high levels of income inequality
	(number)	(%)	(number)
Climate extremes – economic downturns – conflict	6	52	2
Economic downturns	10	50	6
Conflict – climate extremes	19	43	9
Climate extremes – economic downturns	11	50	7
Conflict – economic downturns	3	57	1
Climate extremes	32	42	20
Not affected by major drivers	31	30	11
Conflict	7	50	4

NOTES: PoU = prevalence of undernourishment. The table refers to 119 low- and middle-income countries with information on the PoU that are affected by different combinations of major drivers (conflict, climate extremes and economic downturns). Percentage of population unable to afford a healthy diet is not available for all countries. The values in the table are unweighted averages. See Table S3.5 for definitions and methodology of countries affected by multiple drivers.
SOURCES: Authors' (FAO) own elaboration based on FAO. 2024. *FAOSTAT: Suite of Food Security Indicators*. [Accessed on 24 July 2024]. https://www.fao.org/faostat/en/#data/FS. Licence: CC-BY-4.0 for PoU; FAO. 2024. *FAOSTAT: Cost and Affordability of a Healthy Diet (CoAHD).* [Accessed on 24 July 2024]. https://www.fao.org/faostat/en/#data/CAHD. Licence: CC-BY-4.0 for the percentage of population unable to afford a healthy diet. See Table S3.5 for data sources on drivers.

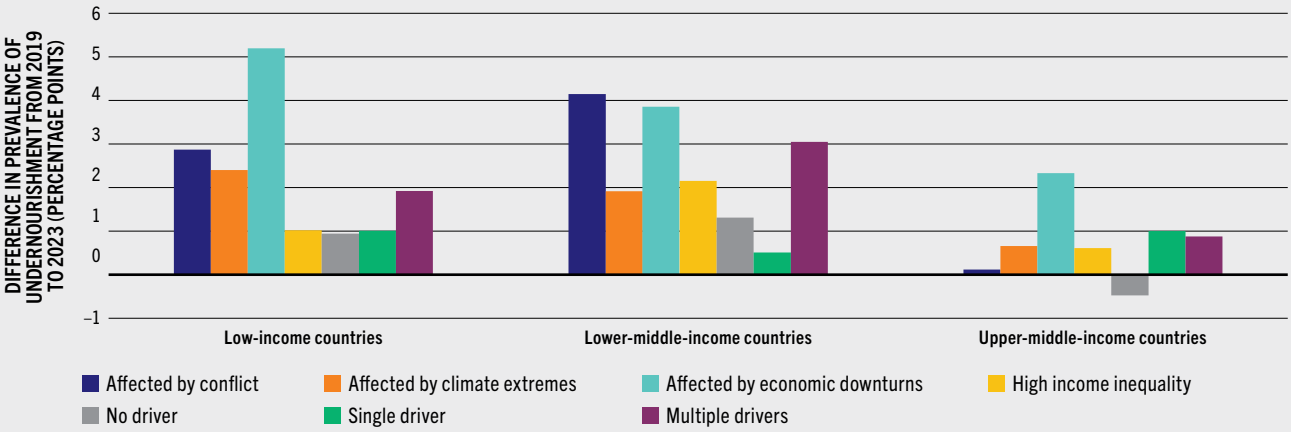
FIGURE S3.2 THE MAJORITY OF UNDERNOURISHED PEOPLE AND STUNTED CHILDREN LIVE IN COUNTRIES AFFECTED BY MULTIPLE MAJOR DRIVERS



NOTES: Figure S3.2A shows the total number (bars) and the average prevalence of undernourishment (PoU) (circles) in 2023. Figure S3.2B shows the total number (bars) and the average prevalence of stunted children (circles) in 2022. For both figures, the analysis is for 119 low- and middle-income countries exposed to no driver, a single driver or multiple drivers. Only conflict, climate extremes and economic downturns are considered. See Table S3.5 for definitions and methodology of countries affected by multiple drivers.
SOURCES: Authors' (FAO) own elaboration based on FAO. 2024. *FAOSTAT: Suite of Food Security Indicators*. [Accessed on 24 July 2024]. https://www.fao.org/faostat/en/#data/FS. Licence: CC-BY-4.0 for PoU; UNICEF, WHO & World Bank. 2023. *Levels and trends in child malnutrition. UNICEF / WHO / World Bank Group Joint Child Malnutrition Estimates – Key findings of the 2023 edition*. New York, USA, UNICEF, Geneva, Switzerland, WHO and Washington, DC, World Bank. https://data.unicef.org/resources/jme-report-2023, http://www.who.int/teams/nutrition-and-food-safety/monitoring-nutritional-status-and-food-safety-and-events/joint-child-malnutrition-estimates, https://datatopics.worldbank.org/child-malnutrition for child stunting data. See data sources for drivers (conflict, climate extremes, economic downturns) in Table S3.5.

https://doi.org/10.4060/cd1254en-figS3-2

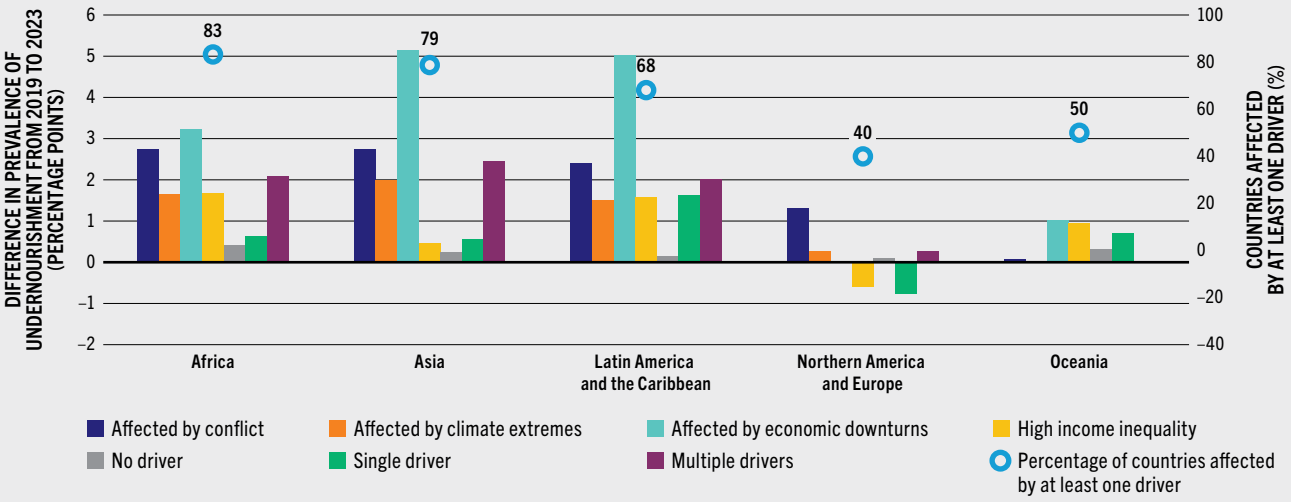
FIGURE S3.3 COUNTRIES AFFECTED BY ECONOMIC DOWNTURNS EXPERIENCED LARGE INCREASES IN THE PREVALENCE OF UNDERNOURISHMENT IN ALL COUNTRY INCOME GROUPS, BUT FOR LOWER-MIDDLE-INCOME COUNTRIES THE LARGEST INCREASE IS IN CONFLICT-AFFECTED COUNTRIES



NOTES: The figure shows the difference in the PoU, measured in percentage points, from 2019 to 2023 for low- and middle income countries affected by conflict, climate extremes and economic downturns, and for countries with high income inequality. Categories are not mutually exclusive, as a country can be affected by more than one driver and also face high income inequality. The figure also shows the difference in the PoU by different combinations of drivers (no driver, single driver, multiple drivers), excluding high income inequality. The analysis is shown by country income group for a sample of 119 low- and middle income countries with available PoU information. See Table S3.5 for definitions and methodology.
SOURCES: Authors' (FAO) own elaboration based on FAO. 2024. *FAOSTAT: Suite of Food Security Indicators.* [Accessed on 24 July 2024]. https://www.fao.org/faostat/en/#data/FS. Licence: CC-BY-4.0 for PoU; World Bank. 2022. World Development Indicators. In: *World Bank.* [Cited 31 October 2023]. https://datatopics.worldbank.org/world-development-indicators for country income group data. See Table S3.5 for data sources on drivers.

https://doi.org/10.4060/cd1254en-figS3-3

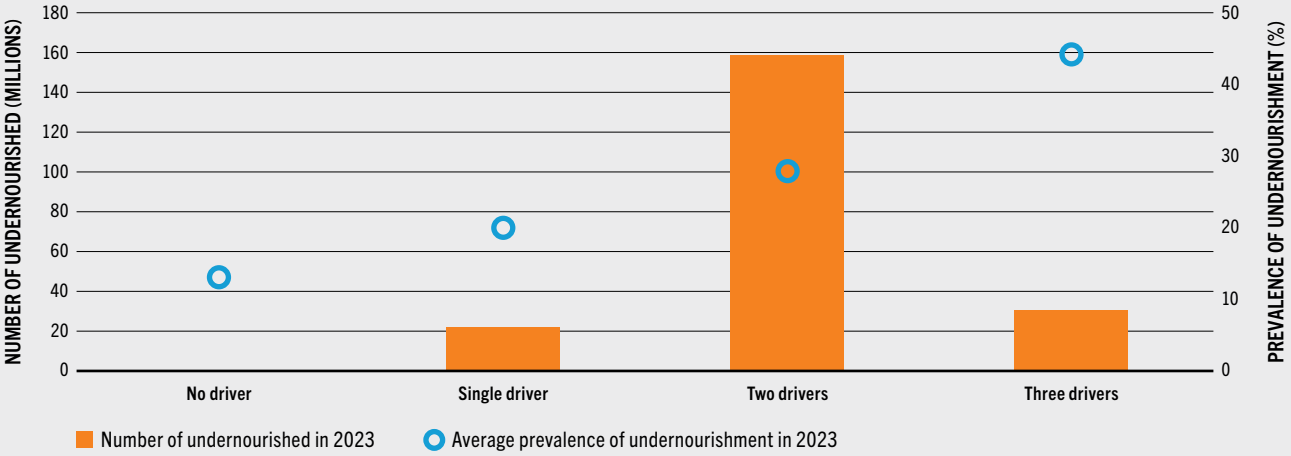
FIGURE S3.4 CHANGE IN THE PREVALENCE OF UNDERNOURISHMENT BETWEEN 2019 AND 2023 BY TYPE OF DRIVER AND GEOGRAPHICAL REGION



NOTES: The left axis shows the difference in the PoU, measured in percentage points, from 2019 to 2023 for low- and middle income countries affected by conflict, climate extremes and economic downturns, and for countries with high income inequality, and grouped by region (bars). Categories are not mutually exclusive, as a country can be affected by more than one driver and also face high income inequality. The figure also shows the difference in the PoU by different combinations of drivers (no driver, single driver, multiple drivers), excluding high income inequality. The right axis shows the percentage of countries in each region that were affected by at least one driver (circles). The analysis is shown for a sample of 119 low- and middle-income countries with available PoU information. See Table S3.5 for definitions and methodology.
SOURCE: Authors' (FAO) own elaboration based on FAO. 2024. *FAOSTAT: Suite of Food Security Indicators.* [Accessed on 24 July 2024]. https://www.fao.org/faostat/en/#data/FS. Licence: CC-BY-4.0 for PoU.

https://doi.org/10.4060/cd1254en-figS3-4

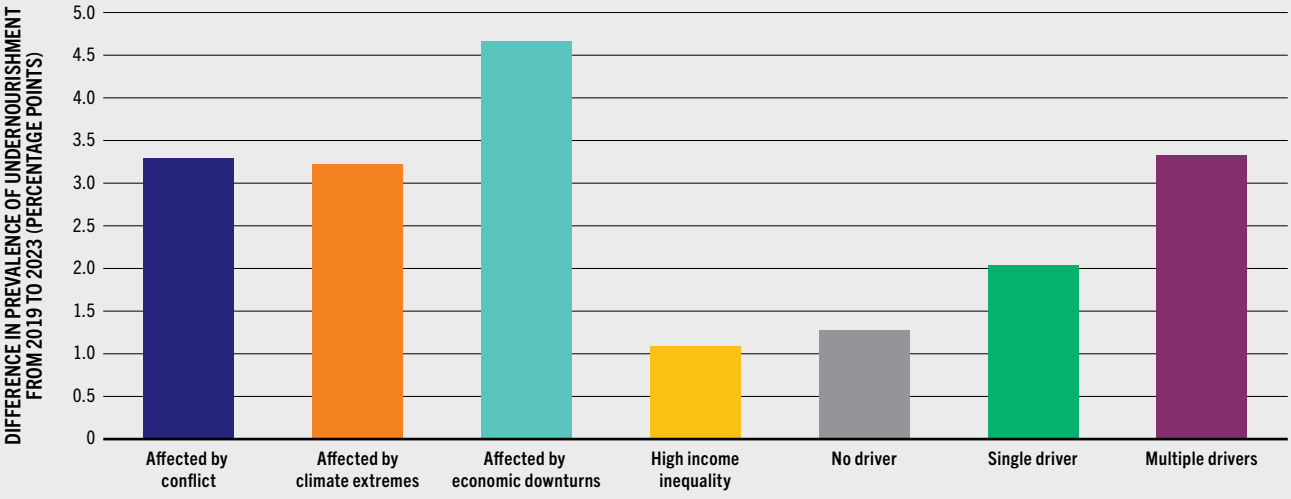
FIGURE S3.5 PROTRACTED MAJOR FOOD CRISIS COUNTRIES AFFECTED BY THREE MAJOR DRIVERS EXPERIENCE THE HIGHEST LEVEL OF FOOD INSECURITY, 2023



NOTES: The figure shows the total number of undernourished people in 2023 in the 18 countries facing protracted major food crises (left axis – orange bars) by different combinations of major drivers (conflict, climate extremes and economic downturns). The figure also shows the unweighted average prevalence of undernourishment in the same countries (right axis – blue circles). See Table S3.5 for definitions and methodology on countries affected by major drivers and the *Global Report on Food Crises 2024*[38] for a definition of countries in protracted major food crisis.
SOURCES: Authors' (FAO) own elaboration based on FAO. 2024. *FAOSTAT: Suite of Food Security Indicators*. [Accessed on 24 July 2024]. https://www.fao.org/faostat/en/#data/FS. Licence: CC-BY-4.0 for prevalence of undernourishment; FSIN (Food Security Information Network) & GNAFC (Global Network Against Food Crises). 2024. *Global Report on Food Crises 2024*. Rome. https://www.fsinplatform.org/report/global-report-food-crises-2024 for list of countries in protracted major food crisis. See Table S3.5 for data sources on drivers.

https://doi.org/10.4060/cd1254en-figS3-5

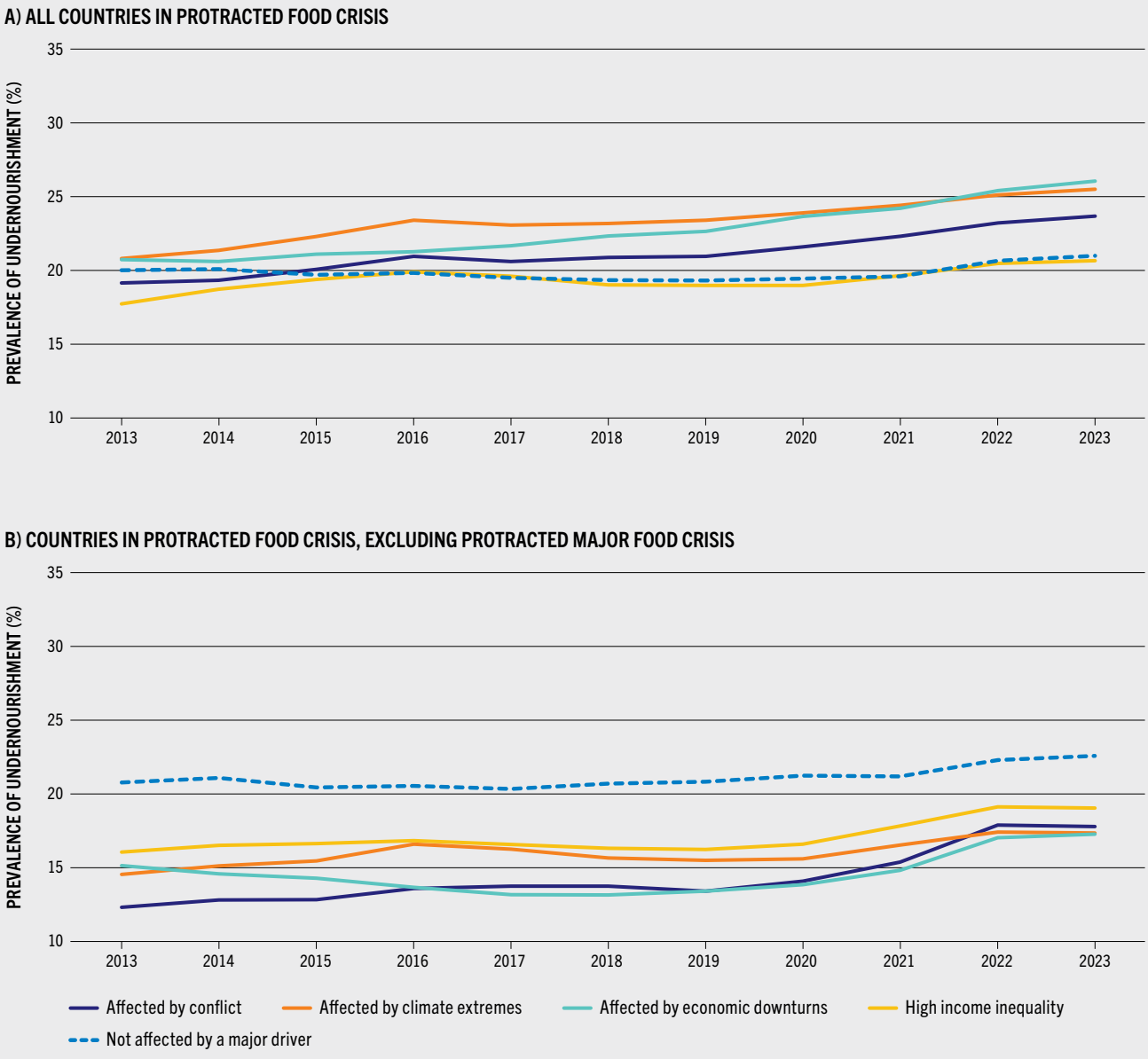
FIGURE S3.6 CHANGE IN THE PREVALENCE OF UNDERNOURISHMENT BETWEEN 2019 AND 2023 IN PROTRACTED MAJOR FOOD CRISIS COUNTRIES BY TYPE OF DRIVER



NOTES: The figure shows the average difference in the prevalence of undernourishment (PoU), measured in percentage points, from 2019 to 2023 in the 18 countries facing protracted major food crises and affected by conflict, climate extremes and economic downturns, and for countries with high income inequality. Categories are not mutually exclusive, as a country can be affected by more than one driver and also facing high income inequality. The figure also shows the difference in the PoU by different combinations of drivers (no driver, single driver, multiple drivers), excluding high income inequality. See Table S3.5 for definitions and methodology.
SOURCES: Authors' (FAO) own elaboration based on FAO. 2024. *FAOSTAT: Suite of Food Security Indicators*. [Accessed on 24 July 2024]. https://www.fao.org/faostat/en/#data/FS. Licence: CC-BY-4.0 for PoU; FSIN & GNAFC. 2024. *Global Report on Food Crises 2024*. Rome. https://www.fsinplatform.org/report/global-report-food-crises-2024 for list of countries in protracted major food crisis. See Table S3.5 for data sources on drivers.

https://doi.org/10.4060/cd1254en-figS3-6

FIGURE S3.7 PREVALENCE OF UNDERNOURISHMENT IN PROTRACTED FOOD CRISIS COUNTRIES AFFECTED BY THE MAJOR DRIVERS AND FACED WITH HIGH INCOME INEQUALITY, 2013–2023



NOTES: Figure S3.7A shows the prevalence of undernourishment (PoU) between the years 2013 and 2023 for 33 countries in protracted food crisis affected by any of the three major drivers (conflict, climate extremes and economic downturns), and for countries with high income inequality. Figure S3.7B shows the PoU between the years 2013 and 2023 for 15 countries in protracted food crisis, but not in protracted major food crisis. Categories are not mutually exclusive, as a country can be affected by more than one driver and/or face high income inequality. PoU estimates are unweighted. See Table S3.5 for definitions and methodology.

SOURCES: Authors' (FAO) own elaboration based on FAO. 2024. *FAOSTAT: Suite of Food Security Indicators.* [Accessed on 24 July 2024]. https://www.fao.org/faostat/en/#data/FS. Licence: CC-BY-4.0 for PoU; FSIN & GNAFC. 2024. *Global Report on Food Crises 2024.* Rome. https://www.fsinplatform.org/report/global-report-food-crises-2024 for list of countries in protracted major food crisis. See Table S3.5 for data sources on drivers.

https://doi.org/10.4060/cd1254en-figS3-7

» Differences between the list of countries affected by major drivers in the 2021 edition of this report and the updated list in this year's report

Among the 108 countries that were classified in both reports, 60 countries changed driver classification. Eleven countries were not classified in *The State of Food Security and Nutrition in the World 2021*,[31] but they are in *The State of Food Security and Nutrition in the World 2024*: Guinea, Guinea-Bissau, Libya, Mauritius, Niger, Republic of Moldova, Syrian Arab Republic, Tajikistan, Uganda, Zambia and Zimbabwe. Two countries are not classified in *The State of Food Security and Nutrition in the World 2024*, but they were in *The State of Food Security and Nutrition in the World 2021*:[31] Guyana, which is now a high-income country, and Lesotho, which does not have PoU data.

Nine countries affected by **conflict** (alone or with other drivers) based on *The State of Food Security and Nutrition in the World 2021*[31] are not affected by conflict based on *The State of Food Security and Nutrition in the World 2024* (Angola, Côte d'Ivoire, Georgia, Indonesia, Liberia, Nepal, Rwanda, Sri Lanka and Uzbekistan). This is due to a change in methodology that now looks only at more recent conflict (i.e. happening in the last two five-year subperiods rather than the last four five-year subperiods). On the other hand, 12 more countries affected by conflict (alone or with other drivers) based on *The State of Food Security and Nutrition in the World 2024* were not affected by conflict or not included in the analysis in *The State of Food Security and Nutrition in the World 2021*[31] (Azerbaijan, Brazil, Burkina Faso, Haiti, Iran [Islamic Republic of], Kenya, Lebanon, Libya, Mexico, Mozambique, Niger and Syrian Arab Republic). The high level of PoU in Liberia and Rwanda (average 35 percent in 2019) and low level of PoU in Azerbaijan, Brazil, the Islamic Republic of Iran, Lebanon, Libya and Mexico (average 5 percent in 2019) explain the higher level of PoU for countries affected by conflict in Figure 21 of *The State of Food Security and Nutrition in the World 2021*[31] compared with Figure 18A in *The State of Food Security and Nutrition in the World 2024*.

Eleven countries affected by **economic downturns** (alone or with other drivers) based on *The State of Food Security and Nutrition in the World 2021*[31] are not affected by economic downturns based on *The State of Food Security and Nutrition in the World 2024* (Afghanistan, Central African Republic, Democratic Republic of the Congo, Dominica, Ecuador, Iran [Islamic Republic of], Lebanon, Lesotho, Madagascar, Vanuatu, Venezuela [Bolivarian Republic of] and Yemen). This might be due to a more restrictive use of the PoU change point analysis. On the other hand, 18 more countries affected by economic downturns (alone or with other drivers) based on *The State of Food Security and Nutrition in the World 2024* were not affected by economic downturns in *The State of Food Security and Nutrition in the World 2021*[31] (Bolivia [Plurinational State of], Chad, Comoros, Cuba, Fiji, Gabon, Ghana, Mali, Mauritania, Morocco, Namibia, Pakistan, Paraguay, Somalia, Syrian Arab Republic, Türkiye, Zambia and Zimbabwe). Although there is a high level of PoU in Somalia, Zambia and Zimbabwe (average 41 percent), eleven countries have a PoU level less than 15 percent (average 6 percent). In *The State of Food Security and Nutrition in the World 2021*,[31] there was a high level of PoU in the Democratic Republic of Congo, Madagascar and Yemen (average 36 percent in 2019) and a low level of PoU only in Dominica, Ecuador, the Islamic Republic of Iran, Lebanon and Vanuatu (average 9 percent). This explains the higher level of PoU for countries affected by economic downturns in Figure 21 of *The State of Food Security and Nutrition in the World 2021*[31] compared with Figure 18A in *The State of Food Security and Nutrition in the World 2024*.

Fourteen countries affected by **climate extremes** (alone or with other drivers) based on *The State of Food Security and Nutrition in the World 2021*[31] are not affected by climate extremes based on *The State of Food Security and Nutrition in the World 2024* (Albania, Armenia, China, Colombia, Costa Rica, Georgia, Guatemala, Kyrgyzstan, Lesotho, Myanmar, Nigeria, Paraguay, Serbia and Venezuela [Bolivarian Republic of]). On the other hand, 16 countries affected by climate extremes (alone or with other drivers) based on *The State of Food Security and Nutrition in the World 2024* were not affected by climate extremes in *The State of Food Security and Nutrition in the World 2021*[31] (Algeria, Angola, Benin, Bulgaria, Ecuador, Gabon, Guinea-Bissau, Iraq, Jordan, Papua New Guinea, Syrian Arab Republic,

Tajikistan, Togo, Tunisia, Uganda and Zimbabwe). The difference in the classification is also due to a new more comprehensive and longer dataset on cereal production and imports together with improvements to the methodology used to identify the vulnerability of a country to climate variability and extremes (see Table S3.5).

Twelve countries **not affected** by a driver based on *The State of Food Security and Nutrition in the World 2021*[31] are now affected by climate extremes (Benin, Bulgaria, Gabon, Papua New Guinea, Togo and Tunisia), conflict (Azerbaijan and Burkina Faso) or economic downturns (Bolivia [Plurinational State of], Comoros, Fiji, Gabon and Namibia). For four of them (Gabon, Namibia, Papua New Guinea and Togo) the average PoU in 2019 was 21 percent. On the other hand, fifteen countries are not affected by a driver in *The State of Food Security and Nutrition in the World 2024*. In *The State of Food Security and Nutrition in the World 2021*,[31] these countries were either missing (Guinea, Mauritius and Republic of Moldova), or affected by climate extremes (Albania, Armenia, China, Costa Rica, Georgia, Guatemala, Kyrgyzstan, Serbia and Venezuela [Bolivarian Republic of]), economic downturns (Dominica, Vanuatu and Venezuela [Bolivarian Republic of]) or conflict (Liberia and Georgia), and their average PoU was 8 percent. This is why the level of PoU for countries affected by no driver in Figure 18A of *The State of Food Security and Nutrition in the World 2024* is slightly lower compared with the level of PoU for countries affected by no driver shown in Figure 20 of *The State of Food Security and Nutrition in the World 2021*.[31]

Eighteen countries are exposed to a **higher number of drivers** based on *The State of Food Security and Nutrition in the World 2024*. In particular, countries affected by none or one driver (Algeria, Brazil, Cuba, Gabon, Ghana, Iraq, Jordan, Kenya, Mali, Mauritania, Mexico, Morocco and Mozambique) or two drivers (Chad, Haiti, Pakistan, Somalia and Türkiye) now face the negative impact of a higher number of drivers. On the other hand, sixteen countries were affected by a higher number of drivers based on *The State of Food Security and Nutrition in the World 2021*.[31] Among these sixteen countries: i) conflict was identified as a driver in *The State of Food Security and Nutrition in the World 2021*,[31] but not in *The State of Food Security and Nutrition in the World 2024* for seven of them; ii) six are no longer identified as affected by economic downturns; and iii) five of them are no longer identified as affected by climate extremes. ■

SUPPLEMENTARY MATERIAL TO CHAPTER 4

S4.1 General methodology (applied to public and private sources of financing)

Supportive expenditures and weighting

The concept of food security and nutrition is cross-sectoral in nature. As a result, some financing flows were deemed to contribute wholly to food security and nutrition, i.e. to have solely or mainly food security and nutrition outcomes (specific expenditures), while others were deemed to have some food security and nutrition outcomes, but also substantial outcomes related to different policy areas (supportive expenditures). See Supplementary material to Chapter 3 for a detailed list of these expenditures by type.

To reflect as closely as possible the impact of these supportive expenditures on food security and nutrition, a weight was applied to them. The weight, 22 percent, was calculated based on household spending on food as a percentage of GDP in LICs, LMICs and UMICs.[g]

S4.2 Methodology for the estimation of domestic public spending on food security and nutrition

Among the sample of countries covered in the exercise aimed at developing preliminary estimates of public spending on food security and nutrition, those for which budget data were publicly available for at least the most recent five years were selected. These countries are Benin, Brazil, Georgia, India, Kenya, Mexico, Nigeria, the Philippines, South Africa and Uganda.

Data on public budget were collected from different data sources, in different formats and with varying degrees of detail and were classified according to the food security and nutrition financing definitions, both core and extended, using the keywords list developed and available in Table S3.3 of the Supplementary material to Chapter 3.

The amounts and evolution of public spending on agriculture and on food security and nutrition are presented for some LICs in **Section 4.2** of the main report and for middle-income countries (MICs) in this supplementary material.

Data source for public spending on agriculture

In **Section 4.2** of the main report, indicators of public spending on food security and nutrition are analysed in comparison with aggregates of public spending specific to agriculture. As an estimate of agricultural spending for Uganda, this report uses a narrow definition of public spending on food and agriculture as defined by FAO's Monitoring and Analysing Food and Agricultural Policies (MAFAP) programme, which is consistent with the raw data used including both national and subnational (decentralized) spending.[h] For the other nine countries included in this analysis (Benin, Brazil, Georgia, India, Kenya, Mexico, Nigeria, Philippines and South Africa), budgetary central government data were found to be comparable with: i) the data reported to the FAO Statistics Division on GEA in its annual questionnaire; and ii) the data reported to the IMF using the analytical framework of the IMF's Government Finance Statistics (GFS) Manual, 2014.[39]

Estimating public spending on food security and nutrition

For all countries, budget data defined according to the Classification of the Functions of Government (COFOG) serves as the basis for calculating food security- and nutrition-related expenditure. In brief, COFOG comprises a three-level classification with ten divisions at the top level, for example, "Economic affairs". Each division is broken down into between six and nine groups at the next level of detail, for example, "Agriculture, forestry, fishing and hunting". In most cases, these groups, in turn, are partly subdivided further into classes, for example – in the case of

g The source for share of food consumption in household consumption in LICs, LMICs and UMICs is FAOSTAT,[26] while for household consumption as a percentage of GDP in these country groups it is the World Bank.[27]

h Such a definition captures only agriculture-specific expenditure and excludes consumers' transfers, resulting as comparable with, in terms of definitions, the government expenditure on agriculture (GEA) estimate produced by the FAO Statistics Division.

TABLE S4.1 STRUCTURE OF GENERAL GOVERNMENT AND ITS SUBSECTORS UNDER THE CLASSIFICATION OF THE FUNCTIONS OF GOVERNMENT

Expenditure by function of government (COFOG)	Central government (excluding social security funds)				Social security funds	State government	Local government	Consolidation column	General government
	Budgetary	Extra-budgetary	Consolidation column	Central government					

SOURCE: IMF (International Monetary Fund). 2014. *Government Finance Statistics Manual 2014.* https://www.imf.org/external/pubs/ft/gfs/manual/2014/gfsfinal.pdf

the group "Fuel and energy" – the class 70435 "Electricity", covering traditional sources of electricity such as thermal or hydro supplies, and newer sources such as wind or solar heat. Therefore, a review of the divisions, groups and classes show how the broad socioeconomic objectives or functions of general government units are to be achieved through various kinds of expenditure. This facilitates evaluating delivery on the economic policy objectives of the consolidated general government and its subsectors, as relevant.

FAO GEA and IMF GFS both encourage reporting countries to present data by separately identifying expenditure for the consolidated general government along with each of its subsectors (Table S4.1). This focus on institutional coverage allows for determining whether expenditure primarily occurs within the context of the execution of the central government budget or whether other levels of government (e.g. subnational government) lead on food security- and nutrition-related activities. In the future, an effort will be made to expand the institutional coverage of the source data to include subnational government, as relevant. This will better inform the results obtained and discussed in **Section 4.2** of the main report on trends and shares of total public spending for food security and nutrition against total budget and against spending on agriculture.

For Benin and Uganda, data on public spending following FAO's MAFAP classification approach were already available and therefore used as a starting point for classifying expenditure on food security and nutrition. This was done by matching MAFAP public spending categories against food security and nutrition financing categories, as presented in Table S4.2. The MAFAP methodology accounts for public spending that benefits the food and agriculture sector directly (i.e. agriculture-specific), as well as agriculture-supportive expenditures that support rural development more broadly and may have an indirect effect on agricultural development (e.g. rural roads, health and education services). Agriculture-specific expenditures are divided into: i) payments to agents (e.g. producers, consumers, traders), also defined as expenditure on private goods and consisting mainly of input/output subsidies for producers and cash transfers/food aid targeting consumers; and ii) general support expenditures that benefit the sector through the provision of public goods (i.e. agriculture infrastructure, provision of extension services, research or marketing facilities).[40]

For the other eight countries, the process of deriving estimates of public spending on food security and nutrition consisted of combining the data published by national authorities for the period from 2018 to 2022, and classifying those data using an automated Excel-based classification tool. This tool facilitates using the national time series data along with their codes and nomenclature to derive the various food security and nutrition classifications. For example, as illustrated in Table S4.3, in the case of the Philippines, the activities of the Office of the Secretary and the Bureau of Fisheries and Aquatic Resources of the Department of Agriculture are classified under the core definition of "food security and nutrition", and more specifically under "domestic production" associated with the component "food availability". Activities of the Agriculture Credit Policy Council and the Center for Post-Harvest Development and Mechanization are instead associated with the extended definition of food security and nutrition.

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TABLE S4.2 MONITORING AND ANALYSING FOOD AND AGRICULTURAL POLICIES PUBLIC SPENDING CATEGORIES AND CORRESPONDING DETERMINANTS UNDER THE FOOD SECURITY AND NUTRITION FINANCING DEFINITION

MAFAP public spending category	Subdeterminant or intervention description (level 4)	Elements of determinants or pathways (level 3)	Main determinant or major driver (level 2)	Definition – core or extended (level 1)
B1. Variable inputs	Domestic production	Food availability	Food consumption	Core
K. Training	Domestic production	Food availability	Food consumption	Core
J. Technical assistance	Domestic production	Food availability	Food consumption	Core
L. Extension/technology transfer	Domestic production	Food availability	Food consumption	Core
C. Income support	Domestic production	Food availability	Food consumption	Core
I. Agricultural research	Domestic production	Food availability	Food consumption	Core
N2. Off-farm irrigation	Domestic production	Food availability	Food consumption	Core
Administrative costs (agriculture-specific)	Domestic production	Food availability	Food consumption	Core
B2. Capital (including on-farm irrigation and infrastructure)	Domestic production	Food availability	Food consumption	Core
B3. On-farm services	Domestic production	Food availability	Food consumption	Core
T3. Rural energy	Domestic production	Food availability	Food consumption	Core
E. Food aid	Food aid	Food availability	Food consumption	Core
P. Marketing	Markets	Food access	Food consumption	Core
N1. Feeder roads	Markets	Food access	Food consumption	Core
T1. Rural roads	Markets	Food access	Food consumption	Core
G. School feeding programmes	Poverty	Food access	Food consumption	Core
H. Other payments to consumers	Poverty	Food access	Food consumption	Core
S. Rural health	Affordability and access to health services	Health services and environmental health	Health status	Core
F. Cash transfers	Pathway 3	Pathway 3. Strengthening economic resilience of the most vulnerable to economic adversity	Economic slowdowns and downturns	Extended
H. Other payments to consumers	Pathway 3	Pathway 3. Strengthening economic resilience of the most vulnerable to economic adversity	Economic slowdowns and downturns	Extended
R. Rural education	Pathway 6	Pathway 6. Tackling structural inequalities, ensuring interventions are pro-poor and inclusive	Poverty and inequality	Extended
O. Storage/public stockholding	Food stocks	Food availability	Food consumption	Core
N3. Other off-farm infrastructure	Markets	Food access	Food consumption	Core
M. Inspection	Domestic production	Food availability	Food consumption	Core
T2. Rural water and sanitation	Water and sanitation	Health services and environmental health	Health status	Core
Q. Miscellaneous (other general support to the food and agriculture sector)	Check matching keyword(s) in the project/programme name.			

TABLE S4.2 (Continued)

MAFAP public spending category	Subdeterminant or intervention description (level 4)	Elements of determinants or pathways (level 3)	Main determinant or major driver (level 2)	Definition – core or extended (level 1)
T4. Other rural infrastructure	Check matching keyword(s) in the project/programme name.			
U. Other support to the rural sector	Check matching keyword(s) in the project/programme name.			

NOTE: MAFAP = Monitoring and Analysing Food and Agricultural Policies.
SOURCE: Adapted from FAO. 2015. *MAFAP Methodology working paper: Volume II. Analysis of public expenditure on food and agriculture.* MAFAP Technical Notes Series. Rome. https://www.fao.org/fileadmin/templates/mafap/documents/Methodological_Guidelines/METHODOLOGY_WORKING_PAPER_Vol2_Public_Expenditures.pdf

TABLE S4.3 EXAMPLE OF CLASSIFICATION OF FOOD SECURITY AND NUTRITION EXPENDITURE AGAINST THE NATIONAL NOMENCLATURE IN THE PHILIPPINES FOR SELECTED CLASSIFICATION OF FUNCTIONS OF GOVERNMENT GROUPS

National nomenclature	Food security and nutrition classification
704. Economic affairs	
7041. General economic, commercial and labour affairs	
Department of Tourism	Extended definition – Pathway 3. Strengthening economic resilience of the most vulnerable to economic adversity
National Parks Development Committee	Extended definition – Pathway 2. Scaling up climate resilience across agrifood systems
7042. Agriculture, forestry, fishing and hunting	
Department of Agriculture of which:	
Office of the Secretary	Core definition – food availability – domestic production
Agriculture Credit Policy Council	Extended definition – Pathway 6. Tackling structural inequalities, ensuring interventions are pro-poor and inclusive
Bureau of Fisheries and Aquatic Resources	Core definition – food availability – domestic production
National Meat Inspection Service	Core definition – food utilization – storage and safety
Philippine Center for Post-Harvest Development and Mechanization	Extended definition – Pathway 3. Strengthening economic resilience of the most vulnerable to economic adversity

SOURCE: Authors' (FAO) own elaboration based on Republic of the Philippines, Department of Budget and Management. 2022. *Budget of expenditures and sources of financing FY 2023.* Manila. https://www.dbm.gov.ph/index.php/2023/budget-of-expenditures-and-sources-of-financing-fy-2023

» One major deviation from the food security and nutrition financing classification framework that applies to all countries is the treatment of forestry-related expenditure, which – due to the impossibility of identifying and classifying it under the extended definition and contrary to what was done for ODA data classification – was kept under the core definition, namely under the main determinant of food consumption.

Overall, the sources and methods for each of the ten countries covered in the exercise are summarized in Table S4.4, supplemented with country-specific notes below. »

TABLE S4.4 DATA SOURCES, COVERAGE AND CLASSIFICATION ASSUMPTIONS FOR DERIVING ESTIMATES OF PUBLIC SPENDING ON FOOD SECURITY AND NUTRITION

Country	Coverage	Classification approach	Main assumptions	Source
Benin	General government expenditure (central level and deconcentrated services)	Starting from expenditure lines classified following the MAFAP approach and then keyword search for all public spending falling outside the MAFAP perimeter, or within the perimeter under categories that may cut across food security and nutrition categories. 5 194 unique budget lines classified, of which 2 331 classified into food security- and nutrition-related spending.	The classification was carried out at the project level taking into consideration the main as well as the secondary function.	World Bank. 2023. *World Bank Data Catalog: Benin BOOST platform: Public expenditure and revenue flows*. [Accessed on 24 July 2024]. https://datacatalog.worldbank.org/search/dataset/0038083. Licence: CC-BY-4.0.
Brazil	Budgetary central government	Components of detailed national programme presentation of public spending, then keywords search. 122 programmes classified into food security- and nutrition-related spending.	Special charges under each ministry relate to administrative costs. A key budget programme appears under more than one ministry, making its direct function difficult to determine. See country note below.	Government of Brazil. 2024. Orçamentos Anuais PLDO I LDO I PLOA I LOA - Atos Normativos. In: *gov.br – Ministério do Planejamento e Orçamento.* [Cited 30 April 2024]. https://www.gov.br/planejamento/pt-br/assuntos/orcamento/orcamento/orcamentos-anuais
Georgia	Budgetary central government	Components of detailed national functional presentation of public spending, then keywords search. 150 programmes classified into food security- and nutrition-related spending.	Only select components under budget code 24-08 "Development of innovations and technologies in Georgia" were allocated to food security and nutrition. See country note below.	Ministry of Finance of Georgia. 2024. *Ministry of Finance of Georgia.* [Cited 30 April 2024]. https://www.mof.ge/en/
India	Budgetary central government	Components of detailed national functional presentation of public spending, then keywords search. 110 programmes classified into food security- and nutrition-related spending.	The annual finance accounts – recurrent and capital expenditure – by minor heads provide sufficient detail to derive many of the core and extended food security and nutrition components. See country note below.	Ministry of Finance, Government of India. 2024. Accounting information. In: *Controller General of Accounts, Department of Expenditure.* [Cited 30 April 2024]. https://cga.nic.in/index.aspx#account-section
Kenya	Budgetary central government	Components of detailed national functional presentation of public spending, then keywords search. 263 programmes classified into food security- and nutrition-related spending.	Clarification may be needed for programmes in water/sanitation, children. See country note below.	The National Treasury & Economic Planning, Republic of Kenya. 2021. *Sector budget proposal reports.* [Cited 30 April 2024]. https://www.treasury.go.ke/sector-budget-proposal-reports
Mexico	Federal government	Components of detailed national functional presentation of public spending, then keywords search. 85 programmes classified into food security- and nutrition-related spending.	Further disaggregation into food security and nutrition categories may be possible. See country note below.	Government of Mexico. 2024. Investor Relations Office of the Ministry of Finance and Public Credit. In: *Gobierno de México.* [Cited 9 May 2024]. https://www.finanzaspublicas.hacienda.gob.mx/es/Finanzas_Publicas/Ingles
Nigeria	Federal government	Components of detailed national MDA presentation of public spending, then keywords search. 311 programmes classified into food security- and nutrition-related spending.	One MDA may contribute to spending in multiple food security and nutrition areas. See country note below.	Federal Government of Nigeria. 2024. *Federal Government of Nigeria.* [Cited 30 April 2024]. https://opentreasury.gov.ng

TABLE S4.4 (Continued)

Country	Coverage	Classification approach	Main assumptions	Source
Philippines	Budgetary central government	Components of detailed national functional presentation of public spending, then keywords search. 175 programmes classified into food security- and nutrition-related spending.	Various budget programmes appear under more than one COFOG Division. See country note below.	Republic of the Philippines, Department of Budget and Management. 2022. *Budget of expenditures and sources of financing FY 2023.* Manila. https://www.dbm.gov.ph/index.php/2023/budget-of-expenditures-and-sources-of-financing-fy-2023
South Africa	Main budget government	Components of detailed national programme presentation of public spending, then keywords search. 220 programmes classified into food security- and nutrition-related spending.	Clarification may be needed for programmes in land, and disaster relief. See country note below.	Republic of South Africa, National Treasury Department. 2024. National budget. In: *National Treasury*. [Cited 30 April 2024]. https://www.treasury.gov.za/documents/national%20budget/default.aspx
Uganda	National and subnational on budget expenditure 2018–2022	Starting from expenditure lines classified following the MAFAP approach and then keyword search for all public spending falling outside the MAFAP perimeter.		World Bank. 2023. *World Bank Data Catalog: Uganda BOOST Public Expenditure Database*. [Accessed on 24 July 2024]. https://datacatalog.worldbank.org/search/dataset/0038076. Licence: CC-BY-4.0.

NOTE: COFOG = Classification of the Functions of Government; MAFAP = Monitoring and Analysing Food and Agricultural Policies; MDA = ministries, departments and agencies.
SOURCE: Authors' (FAO) own elaboration.

» Application of the food security and nutrition financing approach: methodology by country

The following section details the methodology followed for each country to classify public spending on food security and nutrition, as well as data limitations and assumptions.

Benin

Budgetary information used for the Benin case study is sourced from the World Bank BOOST database.[41] It includes actual expenditure data at national and subnational levels and covers on-budget expenditures for the period from 2017 to 2021. Expenditure data from the same source is also aggregated for each year and used as total public budget in this report. The database contains a total of 46 583 observations categorized across administrative (vote/section), economic (recurrent/capital), geographical (central level, deconcentrated services) and functional standard classifications.

In the attempt to reduce the number of budget lines to classify, as well as increase the classification consistency – considering that the same project appears in multiple budget lines within a year and across years – unique identifiers (UIDs) are created for each project, whereby each project is associated with one budget line and is thus classified once. The UID for each project is then associated with a combination of budget information at vote/ministry, programme, project and output levels to then create a classification sheet consisting of 5 194 budget lines to classify, from the initial 46 583 lines in the raw budget file. In the classification sheet, an MAFAP classification category and its associated weight are assigned to each budget line that falls within the MAFAP perimeter, and a category "non-MAFAP" is assigned to expenditures that fall outside the MAFAP perimeter. The MAFAP classification categories are then used as starting points for classifying expenditures on food security and nutrition. This is done by matching MAFAP public spending categories to food security and nutrition financing categories and assigning weights accordingly (see Table S4.2). Of the total 5 194 budget lines, 4 516 (or 87 percent) were classified as "non-MAFAP", while the remaining 678 were classified within one of the MAFAP agriculture-specific or agriculture-supportive

categories. Out of the total 5 194 lines, 2 331 (or 45 percent) were classified into food security- and nutrition-related spending.

For expenditures that fall outside the MAFAP perimeter, the lowest identifiable information across the budget classification variables (i.e. *Section, Chapitre, Fonction Principale and Fonction Secondaire* [Section, Chapter, Primary Function and Secondary Function]) is used to define whether the expenditure is part of the food security and nutrition classification perimeter based on a search of food security and nutrition keywords, and whether it is food security- and nutrition-specific or supportive (therefore to be weighted), as defined and suggested in **Chapter 3** of the main report. Nonetheless, the food security and nutrition classification exercise is subject to some assumptions and limitations. The main ones include the following:

- Detailed documentation for projects and programmes under ministries relevant to food security and nutrition (e.g. health) were not consulted due to time constraints. As such, budget lines identified as food security and nutrition specific are relatively limited because some food security- and nutrition-specific words are unlikely to appear in the name of a budget line. Therefore, some food security and nutrition subdeterminants will have zero or smaller figures than they otherwise would.
- Running and administrative costs of ministries beyond the Ministry of Agriculture (i.e. Ministry of Education, Health, Transport, Environment, Trade and so on) are also assumed to broadly contribute to food security and nutrition.

Brazil

To derive public spending on food security and nutrition, spending estimates were referenced from the *Projeto de Lei Orçamentária Annual*[42] (Annual Budget Proposal) presented by the *Ministério do Planejamento e Orçamento*[43] (Ministry of Planning and Budget), whereby each annual budget proposal details actual expenditure from two years prior. In particular, Volume IV (Details of the Executive Branch's budgetary actions) and Volume VI (Details of the Ministry of Education's budgetary actions) showing expenditure per ministry and containing the programme-level data needed were referenced to derive most of the core and extended food security and nutrition expenditure categories. In total, over 122 budgetary central government food security- and nutrition-related expenditures were identified and classified. A time series covering fiscal years from 2018 to 2022 was used as the basis for developing a preliminary food security and nutrition expenditure series.

Each ministry has a *Programa de Gestão e Manutenção do Poder Executivo* (Programme for Management and Maintenance of the Executive Branch) as well as programmes with titles such as *Operações Especiais: Outros Encargos Especiais* (Special Operations: Other Special Charges) and *Operações Especiais: Gestão da Participação em Organismos e Entidades Nacionais e Internacionais* (Special Operations: Management of Participation in National and International Organizations and Entities). These management programmes and special charges have been applied to administrative food security and nutrition categories. Brazil spends roughly 4 percent of its total annual budget on social protection, seen in both the annual budget proposals and the COFOG series submitted by authorities to the IMF. For this exercise, the relevant programmes identified under social protection (extended definition) were Social Protection under the Unified Social Assistance System (SUAS), Consolidation of the SUAS and Productive Inclusion of People in Situations of Social Vulnerability, which in various years were found in either the Ministry of Development and Social Assistance, Family and Combating Hunger or the Citizenship Ministry. For the purposes of calculating core versus extended food security and nutrition expenditure, it would have been useful to have a breakdown of programme data to allow for the extraction of food-specific social protection spending.

A programme entitled Food and Nutritional Security appears in several ministries, and it was allocated to food affordability in the core definition, under the assumption that spending targets the subsidization of food and food price support. However, the authorities would be able to clarify whether some of these expenditures go towards domestic production or food-specific social protection. The subprogramme was seen under the Presidency of the Republic, Ministry

of Agriculture, Ministry of Health, Ministry of the Environment, Ministry of Regional Development, Citizenship Ministry and Ministry of Development and Social Assistance, Family and Combating Hunger.

Compared to other countries in the exercise presented here, Brazil at the central government level executes relatively low expenditure on categories like transport and water and sanitation, but this appears to be explained by the large portion of spending on social protection. Under water and sanitation in the core definition, the Basic Sanitation programme in the Ministry of Environment and the Ministry of Regional Development was identified as relevant, as was the Environmental Quality programme in the Ministry of Health since this is described online as involving the monitoring of water quality and ensuring compliance with water standards, among other non-food security and nutrition functions. However, it is unclear how much of the health subprogramme is relevant to water and sanitation.

Georgia

For deriving preliminary estimates of public spending on food security and nutrition, the extensive set of fiscal data disseminated by the Department of Budget pertaining to budgetary central government expenditures was consulted.[44] In particular, Chapter VI: State Budget Payments for 12 Months of 2022 According to the Program Classification was referenced as the basis for developing a time series that encompasses each of the fiscal years from 2019 to 2022. Government expenditure on agriculture comprised less than 1 percent of total government expenditure in 2022. However, if seen from the broader perspective of the consolidated general government, GEA increases from 1.8 percent to 3.3 percent of total outlays.

Overall, the process of deriving the preliminary food security and nutrition estimates comprised the classification of more than 150 separate types of budgetary central government outlays. Issues that could be usefully clarified with the authorities are: i) the nature of the various expenditures under budget code 24-08 "Development of innovations and technologies in Georgia". The majority of the components pertain to energy which is "supportive" but some outlays, such as budget code 24-08-02 "Supporting the development of innovation and technology in Georgia" could possibly be food security- and nutrition-specific in nature, and thereby warrant inclusion; ii) under budget code 31-00 "Ministry of Environment Protection and Agriculture of Georgia", certain outlays, such as budget code 31-06 "Modernization of melioration systems" require further information to ensure proper treatment; iii) the nature of the World Bank-financed budget code 32-08 "Innovation, Inclusivity and Quality Project – Georgia I2Q" in relation to food security and nutrition; and iv) partitioning budget code 56-13-09 "Adjara Villages Water Supply and Sewerage Program", funded by the European Union, among the relevant food security and nutrition core and extended components would be analytically useful.

India

Among the countries considered, India is particular. While the national presentation of expenditure is provided in the annual finance accounts, Union Government[45] allocates revenue and capital expenditure into three broad types (general, economic and social services), and Schedules 9 and 10 detailing expenditure by minor heads provide sufficient detail to derive many of the core and extended food security and nutrition components. As such, a time series covering the fiscal years from 2018 to 2022 was used as the basis for developing a preliminary food security and nutrition expenditure series.

By analysing individual budget heads and the components to which the related expenditures pertain, it was possible to classify food security- and nutrition-specific items. Overall, the preliminary food security and nutrition estimates are the result of classifying about 110 separate types of budgetary central government outlays. For example, under the broad category Social Services (a) Education, Sports, Art and Culture, outlays could be separately identified on the National Programme of Mid-Day Meals in Schools under Budget Head 2202 General Education as being relevant for inclusion under Food Access. Similarly, under Social Services (b) Health and Family Welfare, Budget Head 2210 Medical and Public Health includes a variety of outlays,

one of which pertains to Prevention of Food Adulteration that relates to Food Utilization in the core food security and nutrition classification structure. Although the proper allocation across food security and nutrition categories related to Social Services was generally clear, there were a few items warranting further consideration. Among these, Social Services (e) Budget Head 2225 Welfare of Scheduled Castes, Scheduled Tribes, Other Backward classes and Minorities is currently being classified under Pathway 6 as it seems to relate more to Equitable Access to Resources, Assets and Essential Services than it does to the core food security and nutrition category Food Access that includes poverty (e.g. food-specific social protection). This could usefully be clarified with the authorities and, if appropriate, the outlays partitioned. Similarly, Social Services (g), Social Welfare and Nutrition comprises Budget Heads 2236 Nutrition and 2245 Relief on account of Natural Calamities, with the latter further disaggregated by outlays pertaining to Relief on account of Natural Calamities – Drought (2245-01) and Relief on account of Natural Calamities – Floods, Cyclones, and so on (2245-02), with outlays on the associated "of which" items being food security- and nutrition-cross-cutting in nature: Gratuitous Relief, Repairs and Restoration of Damaged Roads and Bridges, Repairs and Restoration of Damaged Water Supply, Drainage and Sewerage (systems); Ex-Gratia Payments to Bereaved Families; and Evacuation of Population. The proper food security and nutrition treatment could usefully be clarified with the authorities and, if appropriate, the outlays reclassified.

Regarding the Economic Services presented in the Finance Accounts, the outlays presented under section (a) Agriculture and Allied Activities could be allocated across various core and extended food security and nutrition categories. This was also the case for section (b) Rural Development, (c) Special Area Programmes, and (d) Irrigation and Flood Control, while other sections (e–j) allowed the identification of some specific expenditures ranging from New and Renewable Energy (including Renewable Energy for Rural Applications) to Fertilizer, Chemical and Pesticides industries, to outlays on the Government of India's Climate Change Action Programme.

As a next step, and with the aim of ensuring the broadest institutional coverage possible for the food security and nutrition estimates, the accounts published for the state governments (30) of India as presented in the State Accounts Report of the Comptroller and Auditor General of India shall be examined.[46]

Kenya

For Kenya, the National Treasury's sector budget proposal reports[47] pertaining to executed budgetary central government expenditures were consulted. The national budget is classified into sectors that are largely aligned with COFOG categories: Agriculture, Rural and Urban Development, Education, Energy, Infrastructure and ICT, Environment Protection Water and Natural Resources, General Economic and Commercial Affairs, Governance Justice Law and Order, Health and Public Administration, and International Relations. Each annual sector report shows actual expenditure for the previous three years by ministry, programme and subprogramme. This was used to develop a fiscal time series for the period from 2017 to 2022. According to the subsector reports and the COFOG series submitted by Kenyan authorities to the IMF, Kenya spent roughly 2 percent of its total budget on GEA during the referenced period.

Overall, the process of deriving the preliminary food security and nutrition estimates comprised the classification of more than 263 separate types of budgetary central government outlays. The subprogramme level data allowed for a generally clear allocation of expenditures to food security and nutrition categories, but issues that could be usefully clarified with the authorities are: i) the nature of the expenditures under subprogramme Transboundary Waters in the programme Water Resources Management in the Water and Sanitation Sub-sector (the spending under this subprogramme is relatively small but was ultimately allocated to water access in the core definition); and ii) whether the expenditures under subprogramme Water Harvesting are potentially spread across domestic water use, agricultural use and/or environmental conservation (this subprogramme falls under the Water Storage and Flood Control in the Water and Sanitation subsector; currently, the entire subprogramme is allocated to water and sanitation in the core definition).

Another possible area of clarification is the subprogramme Child Community Support Services in the programme Social Development and Children Services, which falls under the Ministry of Social Security and Protection. It was unclear whether these expenditures involve community services or social worker support for children, but online sources seem to support that they are development related in the form of social protection for children, therefore falling under the poverty category in the core definition.

Mexico

To derive estimates of public spending on food security and nutrition, a review of the various sources (*Informacion Presupuestaria* [Budget Information]) presented by the *Secretaría de Hacienda y Crédito Público* (Secretariat of the Treasury and Public Credit) relating to expenditure of the Federal Government of Mexico were referenced.[48] In particular, the *Estado Analítico del Ejercicio del Presupuesto de Egresos Clasificación Funcional/Programática* (Analytical Status of the Expenditure Budget Exercise Functional/Programmatic Classification) for each year between 2018 and 2022 was found to contain the level of detail needed to derive most of the core and extended food security and nutrition expenditure categories. In total, over 85 food security- and nutrition-related expenditures were identified and classified.

Although the structure of the functional/programmatic classification facilitates identifying most key outlays, to allow for an even more robust set of food security and nutrition estimates, further clarity on some specific programmes could prove useful. For example, in 2022 there were significant outlays related to the *Censo Agropecuario* (Agricultural Census) being carried out under the programme *Información Nacional Estadística y Geográfica* (National Statistical and Geographic Information) that could be fully allocated to Food Availability (Domestic Production) rather than treated as Supportive, particularly if the agricultural census was completed in the fiscal year. Similarly, the large expenditure on the *Censos Económicos* (Economic Censuses) in 2019 could warrant investigation to ascertain the extent of agrifood and food chain impacts. All expenditure related to the *Instituto Nacional para la Evaluación de la Educación* (National Institute for Educational Evaluation) was also found to have ended in 2019. However, as these outlays would generally be considered food security- and nutrition-supportive, understanding whether the activity or programme was terminated or whether the source data are incomplete would be useful.

An area that could be usefully clarified as to the exact nature of the related expenditure relates to programmes under *Gobernación* (Governorate). Two programmes were identified: *Atención a refugiados en el país* (Support to refugees in the country [E006]) and *Política y servicios migratorios* (Immigration policy and services [E008]) that appear to pertain to Pathway 1. However, other programmes such as *Determinación, ejecución y seguimiento a las acciones de búsqueda de personas desaparecidas y no localizadas* (Planning and monitoring of search for missing persons [P026]) and *Subsidios para las acciones de búsqueda de personas desaparecidas y no localizadas* (Funding for search for missing persons [U008]) could be classified as Food Access should they largely comprise anti-poverty food security-related outlays.

Another area potentially impacting Pathway 6 relates to the various programmes under *Hacienda y Crédito Público* (Treasury and Public Credit). While the subprogramme related to *Agropecuaria, Silvicultura, Pesca y Caza* (Agriculture, Forestry, Fishing and Hunting) falling under *Desarrollo Económico/Otros Asuntos Sociales* (Economic Development/Other Social Issues) clearly relates to providing equitable access to resources, assets and essential services, the subprogramme *Programa de Inclusión Financiera* (Financial Inclusion Programme [F035]), while deemed relevant to food security and nutrition could be investigated further, given the major outlays included therein.

Nigeria

Estimates for Nigeria were referenced from the quarterly budget performance reports of the federal government available on the Open Treasury[49] fiscal data portal. Budget execution data are available by administrative, economic or functional classification for the years from 2018 to 2021. Unfortunately, no data have been published on the portal since 2021.

The functional classification data only contain aggregates for the functions, which is not enough detail to produce food security and nutrition estimates according to the exercise presented here. Therefore, administrative ministries, departments and agencies (MDAs) data are used to derive the preliminary food security and nutrition estimates through the classification of about 311 separate types of federal government outlays.

For the Federal Ministry of Agriculture and Rural Development Headquarters, expenditure is presented as a ministry total without further detail on programmes and subprogrammes. This expenditure was allocated to domestic production in the core definition as it seemed to mostly apply there, but it would be useful to see a breakdown of the activities of this MDA. There are several farmer producer organizations (FPOs) around the country that appear as MDAs in the budget. According to online sources, the activities of FPOs include the cultivation from inputs, technical services, processing and marketing. These MDAs are allocated to food access, under the assumption that most of the spending is for food marketing and improving food distribution networks. A breakdown of the FPOs' spending would allow for a clearer split into more than one food security and nutrition category.

There are several technology business incubator centres listed as MDAs in cities across the country. These expenditures have not been allocated to any food security and nutrition categories as it was unclear whether their function relates in part to any technology or infrastructure for food and nutrition. Overall, Nigeria provided an extensive database of MDA budget performance, but a further breakdown into programmes and subprogrammes would allow for a more robust analysis.

Philippines

In the case of the Philippines, the extensive set of fiscal data disseminated by the Department of Budget and Management pertaining to budget of expenditures and sources of financing was consulted.[50] In particular, Table B.5.c Details of the Classification of the Functions of Government was referenced for each of the fiscal years from 2019 to 2022. Overall, this approach facilitated deriving the preliminary food security and nutrition estimates through the classification of about 175 separate types of budgetary central government outlays.

The authorities have included a variety of programmes under General Services that could be placed under Economic Affairs as well. For example, activities identified as specific to the Department of Agriculture, such as the Agriculture Credit Policy Council, the Bureau of Fisheries and Aquatic Resources, the Fertilizer and Pesticide Authority, the National Meat Inspection Service, the Philippine Center for Post Harvest Development and Mechanization, the Philippine Council for Agriculture and Fisheries and the National Fisheries Research and Development Institute could all be considered related to Domestic Production under the Food Availability dimension. Similarly, general services subprogrammes of the Department of Environment and Natural Resources, such as the Environmental Management Bureau, the National Mapping and Resource Information Authority and the National Waste Water Resources Board, appear to relate to the COFOG division Environmental Protection. Understanding why the national authorities have treated these outlays as general services would ensure that they are properly classified for deriving food security and nutrition estimates.

It was also observed that the activities of the Food and Nutrition Research Institute, operating under the Department of Science and Technology, appear under various COFOG divisions. It would be good to clarify why this is the case in order to ensure proper treatment in deriving food security and nutrition estimates. It would also be useful to better understand why the activities of the agricultural colleges and universities appear under some of the different COFOG divisions that comprise the division Education. For example, it was observed that, among others, the Southern Philippines Agri-Business and Marine and Aquatic School of Technology appears under Tertiary education, Education not definable by level, Subsidiary services to education, R&D Education, and Education n.e.c. Understanding why the national authorities have treated the outlays of these educational institutions in this way would ensure that they are properly classified for deriving food security and nutrition estimates.

South Africa

To derive the estimates of public spending on food security and nutrition, actual budget execution was referenced from the estimates of national expenditure[51] (ENE) presented by the National Treasury as part of their annual budget.[52] Each ENE details the main budget expenditure execution for the previous three years. In particular, the section entitled "Expenditure trends and estimates" in each department's chapter, where spending is available per programme and subprogramme as well as per economic classification, was referenced. This approach facilitated the derivation of preliminary food security and nutrition estimates through the classification of about 220 separate types of budget outlays for the fiscal years 2017–2021.

According to the ENE data, South Africa spent approximately 1 percent of its total budget on GEA during the referenced period, and this outcome is also seen in the COFOG data submitted by South African authorities to the IMF. Although the structure of the data by subprogramme in the ENE facilitates the identification of most key outlays, to allow for an even more robust set of food security and nutrition estimates, further clarity on some specific programmes could prove useful. It was unclear whether the subprogramme Ingonyama Trust Board in the Food Security, Land Reform and Restitution programme is in part related to food security or production, or whether it is purely for restitution purposes. Online sources indicate that this subprogramme in the Department of Agriculture, Land Reform and Rural Development administers land to members of traditional communities, but the purpose of the land is not clear.

Another potential area of improvement is the National Disaster Management Center in the Department of Cooperative Governance and Traditional Affairs where funds are allocated for disaster relief and recovery. Given the reforms that have been implemented in South Africa's disaster funding, it is realistic to believe that at least some of these funds go towards food provision as well as temporary shelter in the case of immediate disaster relief funding. It may be difficult for authorities to extract, but it would have benefited the exercise presented here to see the portion spent on food for displaced people following natural disasters.

Uganda

Budgetary information used for the Uganda case study is sourced from the World Bank BOOST database.[53] It includes actual expenditure data at national and subnational levels and covers on-budget expenditures for 2018–2022. Expenditure data from the same source are also aggregated for each year and used as total public budget in this report. In the raw budget file, expenditure data are structured by standard budget classifiers, namely: administrative (i.e. vote/ministry), economic (recurrent/capital), functional (i.e. education, agriculture, health and so on) and geographical (i.e. national, district/county and so on), and account for 133 392 budget lines.

As done for Benin (see above), UIDs are created for each project, which is associated with a combination of budget information at vote/ministry, programme, project and output levels to then create a classification sheet consisting of 43 216 budget lines that are classified from the initial 133 392 lines in the raw budget file. The MAFAP classification is then used as a starting point following the matching categories in Table S4.4, while the category "Non-MAFAP" is assigned to expenditures that fall outside the MAFAP perimeter. For these, the lowest identifiable information across the budget classification variables (i.e. vote/ministry, programme, project and output levels) is used to define whether the expenditure is part of the food security and nutrition classification perimeter based on a search of food security and nutrition keywords, and whether it is food security- and nutrition-specific or supportive (therefore to be weighted), as defined and suggested in **Chapter 3** of the main report. The same limitations that apply for Benin are also valid for Uganda and include the following:

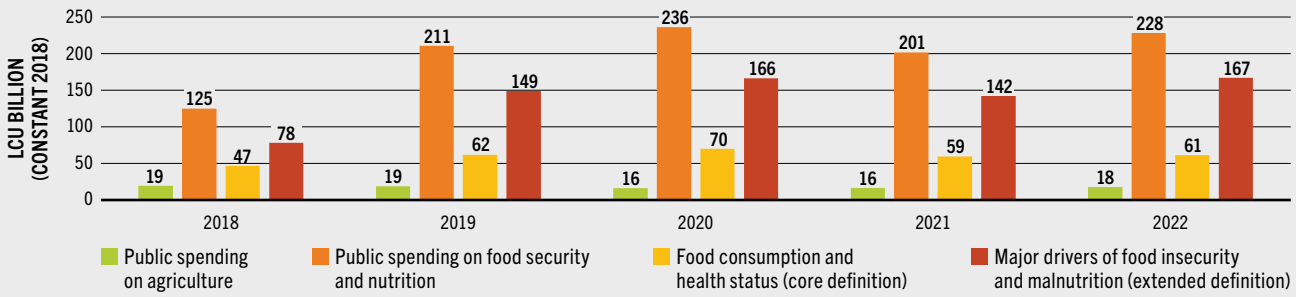
- Detailed documentation for projects and programmes under ministries relevant to food security and nutrition (e.g. health) were not consulted due to time constraints. As such, budget lines identified as specific to food security and nutrition are relatively limited because some food security- and nutrition-specific words are unlikely to appear in the name of a budget line. Therefore, some food security and nutrition

subdeterminants will have zero or smaller figures than they otherwise would.
- Running and administrative costs of ministries beyond the Ministry of Agriculture (i.e. Ministries of Education, Health, Transport, Environment, Trade and so on) are also assumed to broadly contribute to food security and nutrition.

Data on public spending on food security and nutrition

The public spending on food security and nutrition for selected countries is presented in Figures S4.1 to S4.8. »

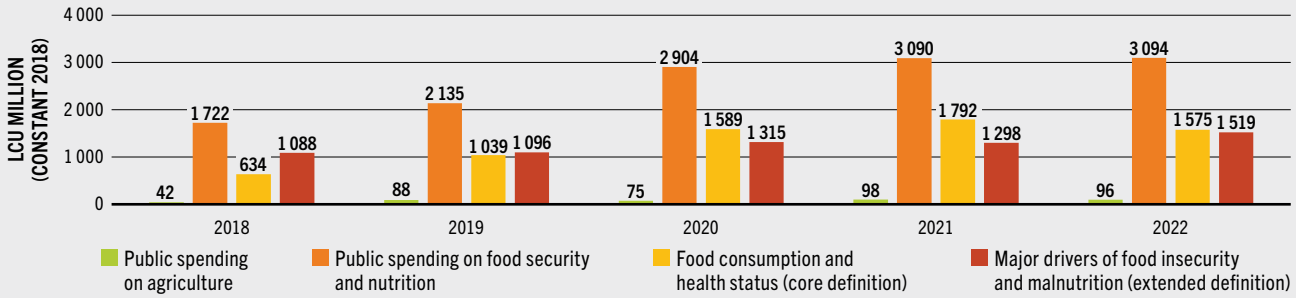
FIGURE S4.1 PUBLIC SPENDING ON AGRICULTURE AND ON FOOD SECURITY AND NUTRITION IN BRAZIL



NOTE: LCU = local currency unit.
SOURCE: Authors' (FAO) own elaboration based on Government of Brazil. 2024. Orçamentos Anuais PLDO I LDO I PLOA I LOA - Atos Normativos. In: *gov.br – Ministério do Planejamento e Orçamento*. [Cited 30 April 2024]. https://www.gov.br/planejamento/pt-br/assuntos/orcamento/orcamento/orcamentos-anuais

https://doi.org/10.4060/cd1254en-figS4-1

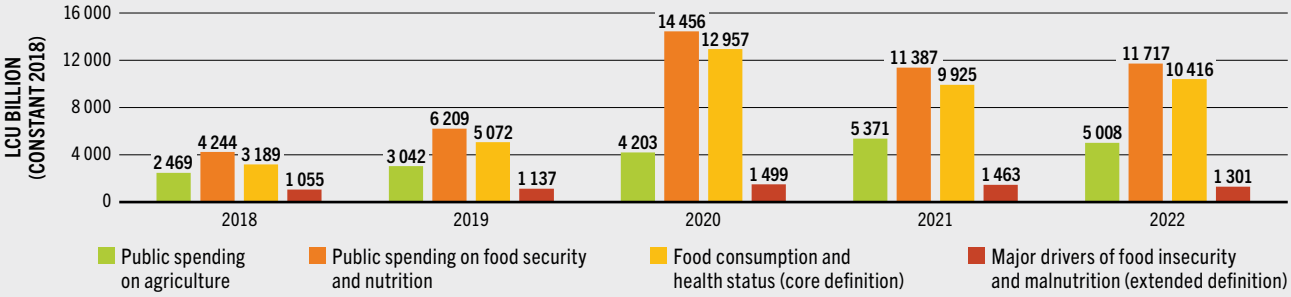
FIGURE S4.2 PUBLIC SPENDING ON AGRICULTURE AND ON FOOD SECURITY AND NUTRITION IN GEORGIA



NOTE: LCU = local currency unit.
SOURCE: Authors' (FAO) own elaboration based on Ministry of Finance of Georgia. 2024. *Ministry of Finance of Georgia*. [Cited 30 April 2024]. https://www.mof.ge/en/

https://doi.org/10.4060/cd1254en-figS4-2

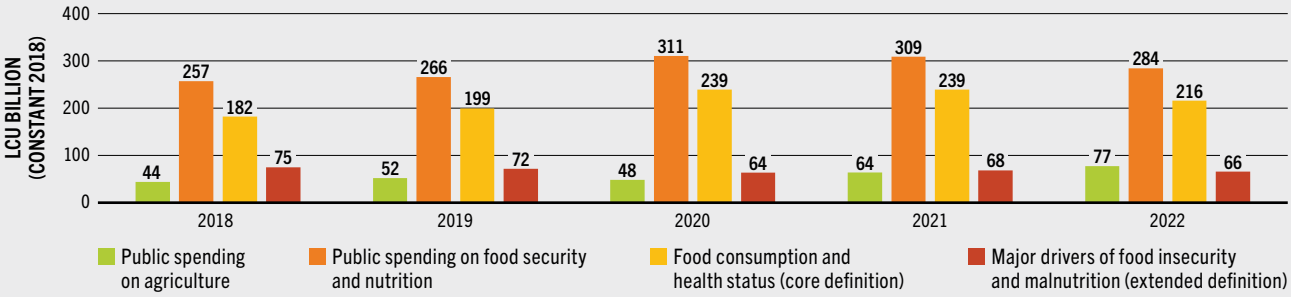
FIGURE S4.3 PUBLIC SPENDING ON AGRICULTURE AND ON FOOD SECURITY AND NUTRITION IN INDIA



NOTE: LCU = local currency unit.
SOURCE: Authors' (FAO) own elaboration based on Ministry of Finance, Government of India. 2024. Accounting information. In: *Controller General of Accounts, Department of Expenditure*. [Cited 30 April 2024]. https://cga.nic.in/index.aspx#account-section

https://doi.org/10.4060/cd1254en-figS4-3

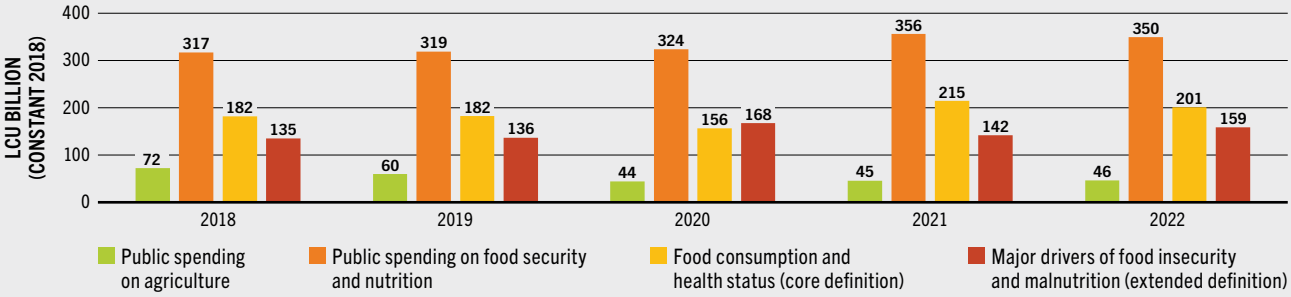
FIGURE S4.4 PUBLIC SPENDING ON AGRICULTURE AND ON FOOD SECURITY AND NUTRITION IN KENYA



NOTE: LCU = local currency unit.
SOURCE: Authors' (FAO) own elaboration based on The National Treasury & Economic Planning, Republic of Kenya. 2021. *Sector budget proposal reports*. [Cited 30 April 2024]. https://www.treasury.go.ke/sector-budget-proposal-reports

https://doi.org/10.4060/cd1254en-figS4-4

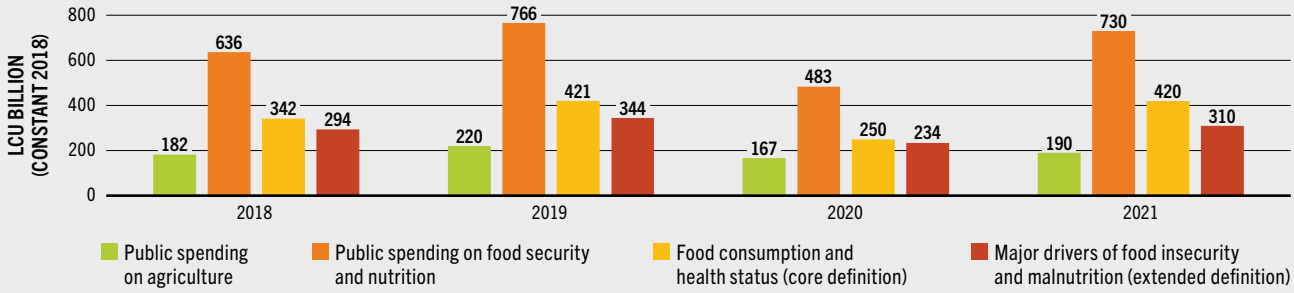
FIGURE S4.5 PUBLIC SPENDING ON AGRICULTURE AND ON FOOD SECURITY AND NUTRITION IN MEXICO



NOTE: LCU = local currency unit.
SOURCE: Authors' (FAO) own elaboration based on Gobierno de México. 2024. Investor Relations Office of the Ministry of Finance and Public Credit. In: *Gobierno de México.* [Cited 9 May 2024]. https://www.finanzaspublicas.hacienda.gob.mx/es/Finanzas_Publicas/Ingles

https://doi.org/10.4060/cd1254en-figS4-5

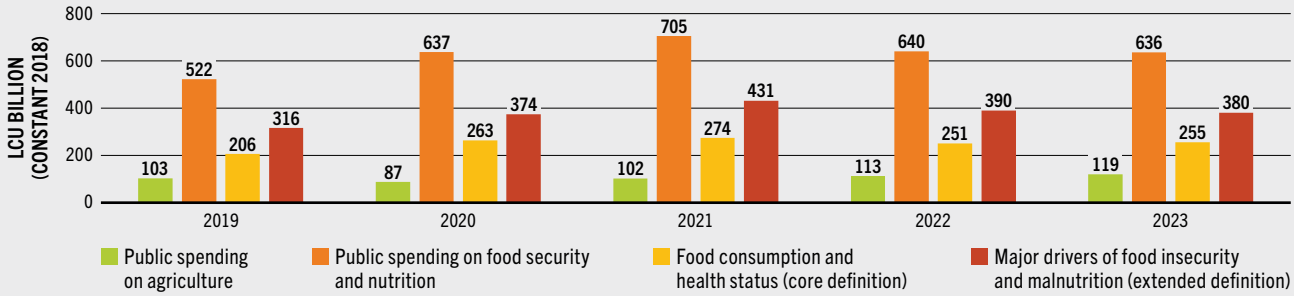
FIGURE S4.6 PUBLIC SPENDING ON AGRICULTURE AND ON FOOD SECURITY AND NUTRITION IN NIGERIA



NOTE: LCU = local currency unit.
SOURCE: Authors' (FAO) own elaboration based on Federal Government of Nigeria. 2024. *Federal Government of Nigeria*. [Cited 30 April 2024]. https://opentreasury.gov.ng

https://doi.org/10.4060/cd1254en-figS4-6

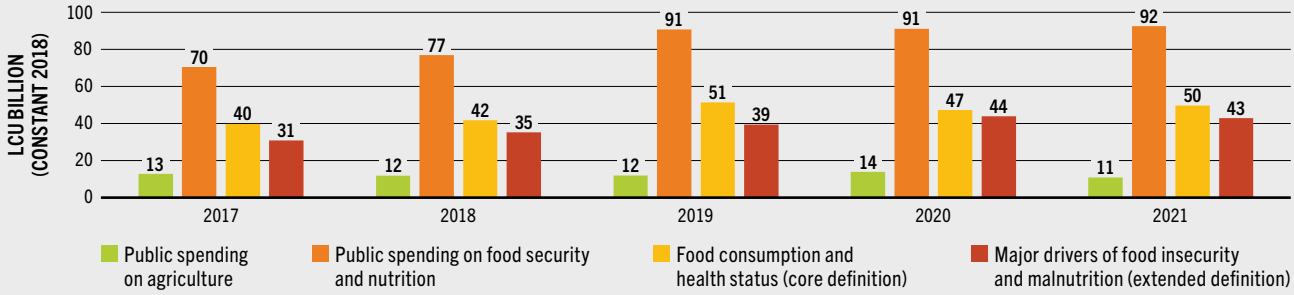
FIGURE S4.7 PUBLIC SPENDING ON AGRICULTURE AND ON FOOD SECURITY AND NUTRITION IN THE PHILIPPINES



NOTE: LCU = local currency unit.
SOURCE: Authors' (FAO) own elaboration based on Republic of the Philippines, Department of Budget and Management. 2022. *Budget of expenditures and sources of financing FY 2023*. Manila. https://www.dbm.gov.ph/index.php/2023/budget-of-expenditures-and-sources-of-financing-fy-2023

https://doi.org/10.4060/cd1254en-figS4-7

FIGURE S4.8 PUBLIC SPENDING ON AGRICULTURE AND ON FOOD SECURITY AND NUTRITION IN SOUTH AFRICA



NOTE: LCU = local currency unit.
SOURCE: Authors' (FAO) own elaboration based on Republic of South Africa, National Treasury Department. 2024. National budget. In: *National Treasury*. [Cited 30 April 2024]. https://www.treasury.gov.za/documents/national%20budget/default.aspx

https://doi.org/10.4060/cd1254en-figS4-8

» S4.3 Methodology for estimating international development finance flows to food security and nutrition

International development financing comprises two main types of flows: official development assistance (ODA), which is humanitarian and development aid from governments or multilateral organizations that meets a minimum grant element requirement;[54] and other official flows (OOF), which are official sector transactions that do not meet ODA criteria (excluding official export credits).[55]

The following main databases were used for ODA and OOF: the OECD's Creditor Reporting System (CRS) database,[56] which tracks humanitarian and development ODA and OOF from Development Assistance Committee (DAC)[57] countries and multilateral organizations (as well as from several other countries, such as Türkiye and the Russian Federation, that do not belong to DAC or indeed to OECD but nonetheless report into this database);[58] and, for China, the AidData database,[59] developed by an international network of researchers based on publicly available information. This tool covers only the period from 2000 to 2017 (for project approval, with implementation until 2021). Other official flows from this source were not used for this analysis, due to the difficulty of determining the extent of their development assistance purpose.

Limited numbers were also obtained from OECD's Total Official Support for Sustainable Development (TOSSD) database[60] (where data are available only from 2019) and, for Brazil's international development assistance, from the Brazilian Institute of Applied Economic Research.[i]

Few significant donors are excluded from these databases. For the largest of them, India, OECD estimates that bilateral development cooperation outflows in 2021 amounted to USD 1 billion. The estimate for South Africa is USD 34 million.[63]

There are limitations to the several ways that the CRS database[56] offers to identify existing food security and nutrition financing, as detailed in **Chapter 3** of the main report. In addition, TOSSD uses the CRS purpose codes, but AidData[59] only uses the CRS's first level of codification, i.e. sector codes. It was therefore decided to use the following methodological steps to identify the interventions in these databases that match this report's definitions of financing for food security and nutrition.

First, for the CRS and TOSSD databases, a list of purpose codes was selected (see Supplementary material to Chapter 3). Second, an artificial intelligence (AI) tool was trained on a sample of database entries, based on keyword searches (see Supplementary material to Chapter 3), to recognize entries relevant to food security and nutrition thanks to text patterns it learned to identify in long and short project descriptions. This tool was then used for several purposes: to identify flows relevant to food security and nutrition in non-selected purpose codes in the CRS and TOSSD databases; to identify flows relevant to food security and nutrition in AidData and in Brazil data; and to classify all the flows identified in all data sources, through both purpose codes and the AI tool, between the core and extended definitions. Third, keyword searches were performed on the results of this screening, on a new sample to measure accuracy and on the full results to sort them between sublevels of the food security and nutrition definition framework as well as between specific and supportive expenditures. When several keywords assigned to different subdeterminants or drivers were found in the same database entry, a semantic similarity analysis was performed to classify the entry in the subdeterminant or driver that contained the most semantically similar entries.

Any double counting between the earmarked contributions that international organizations receive from donor countries and those they pay to recipient countries was eliminated.

S4.4 Private sector financing

Definitions and references for philanthropic flows and for remittances

To estimate philanthropic flows, the same methodology was applied to the CRS database[56] as to ODA/OOF flows (see **Section S4.3**).

i Data collected for the Brazilian Cooperation for International Development Project research.[61] See Schleicher and Barros (2022).[62]

The following sources of information and assumptions were used on cross-border remittances:

- for remittances to low- and middle-income countries – World Bank and KNOMAD brief *Leveraging diaspora finances for private capital mobilization*;[64]
- for the share of remittances going to rural areas (40 percent, based on unpublished data) and for the share of remittances used to finance income-generating activities (15 percent) – The International Fund for Agricultural Development (IFAD) report *Sending Money Home: contributing to the SDGs, one family at a time* (2017);[65]
- for the share of food systems in rural areas employment in LICs/LMICs/UMICs, in the absence of comprehensive research in the area, this was assumed to be 50 percent;
- for the share of agriculture in the GDP of LMICs – World Bank indicator[66] (8.9 percent, rounded up to 10 percent); and
- for food consumption in percentage of household consumption – FAOSTAT's[26] sample of 37 LICs/LMICs/UMICs (excluding China and India); the indicator for medium-tercile households was used, assuming that bottom-tercile households have less access to migration and that fund transfers from migrants from top-tercile households are more likely to represent philanthropy or business investments than remittances.

Definitions and references for foreign direct investments

Section 4.1 of the main report analyses foreign direct investment for announced greenfield projects. Each of these terms is explained here.

United Nations Trade and Development (UNCTAD) defines foreign direct investments (FDIs) as investments made by a private entity resident in one economy in an enterprise resident in another. The investments must involve a long-term relationship and reflect a lasting interest and control, and be made directly rather than through capital markets.[67] UNCTAD also defines them as equity investments (or intercompany loans), yet includes in them international project finance, despite the debt component.

UNCTAD classifies FDIs in four purpose categories, following the OECD framework:[68] **cross-border mergers and acquisitions (M&A), greenfield projects, extension of capital** and **financial restructuring**. UNCTAD provides data for the first two, and the first one is excluded for the purposes of this report, for the reason mentioned above. The OECD framework notes that a sharp distinction is often drawn between greenfield investment, providing fresh capital and additional jobs, and M&A that are perceived to include only a change of ownership in an existing corporate entity. This theoretical distinction between the types of FDIs, however, may differ in practice, and in a number of instances the acquisition of existing enterprises can provide important additional economic benefits.[68] Yet, any redirection into food security and nutrition of the proceeds from the sales of a company by its former shareholders is hypothetical and, if confirmed, would be observed at a different step and through different indicators.

UNCTAD encourages a focus on **announced rather than closed projects**. On project finance, it notes:

> It is clear that using **announcement data** will tend to overestimate the numbers and values of projects, because some projects never reach the stage of construction or completion. In contrast, using **financial close data** will lead to underestimation, because many projects have open-ended financing arrangements or financial close data are not reported [...]. Looking at all project finance (including domestic deals) shows that the degree of underestimation from the use of financial close data is actually larger than the degree of overestimation from the use of announcement data. This is not the case for international projects, where relatively more projects reach financial close, but the degree of underestimation remains substantial.[69]

Definitions and references for blended finance

Blended finance is categorized in **Section 4.1** of the main report under private financing, to reflect its purpose of attracting private funds to investments in sustainable development, despite its limited success so far in doing so (see **Chapter 5** of the main report).

Convergence tracks blended finance deals based on three criteria:

- The transaction attracts financial participation from one or more private sector investor(s).
- The transaction uses catalytic funds in one or more of the following ways:
  - public or philanthropic investors provide concessional capital, bearing risk at below market returns, to mobilize private investment, or provide guarantees or other risk mitigation instruments;
  - transaction design or preparation is grant funded;
  - transaction is associated with a technical assistance facility (e.g. for pre- or post-investment capacity building).
- The transaction aims to create development impact related to the Sustainable Development Goals (SDGs) in developing countries.[70]

Definitions and references for indirect private finance mobilization

Chapter 4 of the main report cites numbers for "private indirect mobilization" in LICs and MICs provided in the joint report *Mobilization of private finance 2020+2021*,[71] by the multilateral development bank (MDB) Task Force on Mobilization of Private Finance, a group of multilateral development banks and development finance institutions. This report, published in June 2023, breaks down total private mobilization (which it also calls private co-financing) between private direct mobilization and private indirect mobilization, which it defines as follows:

Private direct mobilization:

> Financing from a private entity on commercial terms due to the active and direct involvement of an MDB leading to commitment. Evidence of active and direct involvement includes mandate letters, fees linked to financial commitment, or other validated or auditable evidence of an MDB's active and direct role leading to commitment of other private financiers.[71]

Private indirect mobilization:

> Financing from private entities provided in connection with a specific activity for which an MDB is providing financing, where no MDB is playing an active or direct role that leads to the commitment of the private entity's finance.[71]

To avoid any double counting, private direct mobilization is here assumed to be identical to blended finance.

The MDB Task Force also differentiates mobilization from catalysation, which it defines as:

> Private sector financing that results from (as opposed to happening in connection with) an activity or multiple activities of an MDB. It includes investments made because of an operation up to three years after completion.[71]

The numbers provided are not broken down by sector or by SDG but only between investments in infrastructures (which probably contain some supportive investments) and other investments (which may contain some specific investments in agriculture or in food security and nutrition). ■

SUPPLEMENTARY MATERIAL TO CHAPTER 5

S5.1 Methodological notes to Section 5.1 of the main report

Countries' ability to access financing is grouped into three categories: limited, moderate and high ability to access financing. Four major variables were included in the assessment:[j] national income, debt sustainability, governance quality and digitalization, as shown in Table S5.1.

One indicator was used for national income:

1. **World Bank country and lending groups:** Countries are grouped in three clusters (low income, lower-middle income and upper-middle income), based on gross national income per capita as published by the World Bank.[72]

Three indicators were considered for the debt sustainability variable:

1. **Debt Sustainability Framework for Low-Income Countries (LIC DSF)**: The Debt Sustainability Framework (DSF) is the main tool for multilateral institutions and other creditors to assess risks to debt sustainability in LICs and LMICs. The framework classifies countries based on their assessed debt-carrying capacity, estimates threshold levels for selected debt burden indicators, evaluates baseline projections and stress test scenarios relative to these thresholds, and then combines indicative rules and staff's judgement to assign risk ratings of debt distress.[73]
2. **Sovereign Risk and Debt Sustainability Framework for Market Access Countries (MAC SRDSF)**: Debt sustainability for market access countries refers to the ability of a country to manage its debt obligations without compromising its long-term economic growth prospects or facing the risk of default. Market access countries are those nations that have access to international financial markets for borrowing capital through the issuance of bonds or other debt instruments. Debt sustainability assessments typically involve analysing a country's current debt levels, its ability to generate sufficient revenue to service its debt, the sustainability of its fiscal policies, the structure of its debt (maturity profile, currency composition, and so on), and its capacity to respond to adverse shocks. The aim is to ensure that a country's debt burden remains manageable over time, allowing it to meet its debt obligations while also fostering sustainable economic development.[74]
3. **Short-term debt (% of total reserves)**: Short-term debt includes all debt that has an original maturity of one year or less and interest in arrears on long-term debt. Total reserves include gold.[75, 76]

For the governance variable, five out of six indicators of the Worldwide Governance Indicators (WGI)[k] were used:[l]

1. **Voice and accountability**: This considers the perception of the extent to which a country's citizens can participate in the public domain, e.g. ability to elect their government, and freedom of expression and association.[78]
2. **Government effectiveness**: This captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility

j Of course, the list of variables considered is not exhaustive. Other variables that can determine countries' ability to access financing include national inflation, the current account balance and fiscal deficit.

k The WGI are designed to help researchers and analysts assess broad patterns in perceptions of governance across countries and over time. The WGI aggregate data from more than 30 think tanks, international organizations, non-governmental organizations and private firms across the world and are selected on the basis of three key criteria: i) they are produced by credible organizations; ii) they provide comparable cross-country data; and iii) they are regularly updated. The data reflect the diverse views on governance of many stakeholders worldwide, including tens of thousands of survey respondents and experts.[77]

l Please note that the LIC DSF and MAC SRDSF are composite indicators that include governance considerations for their calculation. For instance, the LIC DSF looks at the World Bank's Country Policy and Institutional Assessment, which is an annual assessment of the policies and institutions of the World Bank's borrowing countries, used mainly for the International Development Association Performance Based Allocations. Therefore, both indicators are considered to already include governance and digitalization variables (the latter, considering the role of digitalization in transparency).

TABLE S5.1 OVERVIEW OF METHODOLOGY FOR SECTION 5.1 OF THE MAIN REPORT

Ability to access financing	Income group	Debt assessment		Apply only when there is no LIC DSF or MAC SRDSF assessment	
				Alternative debt assessment	Governance and digitalization
		Debt Sustainability Framework for Low-Income Countries (LIC DSF)	Sovereign Risk and Debt Sustainability Framework for Market Access Countries (MAC SRDSF)	Short-term debt	Worldwide Governance Indicators and Digital Adoption Index
Limited	Low-income countries	High Moderate In debt distress	n.a.	n.a.	n.a.
	Lower-middle-income countries	High In debt distress	High risk – sovereign risk Unsustainable	Equal or >100%	Are countries above the fourth quartile of the country's income group? No
Moderate	Lower-middle-income countries	Low Moderate	Moderate Sustainable subject to risk Sustainable (but not with high probability)	<100%	Are countries above the fourth quartile of the country's income group? No
	Upper-middle-income countries	n.a.	High risk – sovereign risk Unsustainable	Equal or >100%	Are countries above the fourth quartile of the country's income group? No
High	Lower-middle-income countries	n.a.	Low Sustainable (with high probability)	<100%	Are countries above the fourth quartile of the country's income group? Yes
	Upper-middle-income countries	n.a.	Low Moderate Sustainable (with high/not with high probability) Sustainable subject to risk	<100%	n.a.

NOTES: n.a. = not applicable. Please note that two upper-middle-income countries are assessed with the LIC DSF indicator. These countries are treated as lower-middle-income countries while applying the methodology.
SOURCE: Authors' (FAO) own elaboration.

of the government's commitment to such policies.[79]

3. **Regulatory quality**: This captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.[80]
4. **Rule of law**: This considers the confidence that citizens have in society's rule, particularly contract enforcement, property rights and the functioning of police and courts.[81]
5. **Control of corruption**: This captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.[82]

For the digitalization variable, the World Bank's **Digital Adoption Index (DAI)** was used. The DAI is an index with global coverage that measures the adoption of digital tools in three dimensions: people, government and business.[83]

The country groups were created following these steps (please see Table S5.1 for details):

1. The income groups are assigned to each level (limited, moderate and high ability). LICs are placed in the limited group, LMICs in the moderate group and UMICs in the high group.
2. The results are compared to the debt composite indicators (LIC DSF for LICs and MAC SRDSF for LMICs and UMICs), and countries are moved one ability's category above or below depending on how they are assessed

(see Table S5.1). However, no UMIC is placed in "limited" and no LIC in "high".[m]

For countries for which data are not available for either of the two debt indicators (LIC DSF and MAC SRDSF), an alternative method was implemented, following the steps shown in Table S5.1.

1. The levels of ability to access financing were assigned to the income groups following the same criteria as for the main method.
2. For the debt indicator, the short-term debt as a percentage of national reserves was used. Following the Guidotti-Greenspan rule,[n] a country with a level above 100 percent is moved one category below (high to moderate for UMICs, moderate to limited for LMICs).
3. For governance and digitalization, the country's index for each of the five governance indicators and the digitalization index are compared against the fourth quartile of the index for the sample of countries of its own country income group (e.g. an LMIC is compared against the fourth quartile of the LMIC group). If a country is assessed above the fourth quartile for all indicators, it is moved up to the ability category above. ■

m Please consider the exceptions highlighted in the notes of Table S5.1.

n The rule argues that the ratio of a country's reserves to short-term debt should be equal to one.[84]

NOTES

1 **IMF (International Monetary Fund).** 2024. *World Economic Outlook. Steady but slow: resilience amid divergence*. Washington, DC. https://www.imf.org/en/Publications/WEO/Issues/2024/04/16/world-economic-outlook-april-2024

2 **Laborde, D. & Torero, M.** 2023. Modeling actions for transforming agrifood systems. In: J. von Braun, K. Afsana, L.O. Fresco & M.H.A. Hassan, eds. *Science and Innovations for Food Systems Transformation*. pp. 105–132. Cham, Switzerland, Springer International Publishing. https://doi.org/10.1007/978-3-031-15703-5_7

3 **UN DESA (United Nations Department of Economic and Social Affairs).** 2022. World Population Prospects 2022. In: *United Nations*. [Cited 24 July 2024]. https://population.un.org/wpp

4 **UN DESA.** 2019. World Population Prospects 2019. In: *United Nations.* [Cited 12 June 2024]. https://population.un.org/wpp2019

5 **European Union, FAO (Food and Agriculture Organization of the United Nations), UN-Habitat (United Nations Human Settlements Programme), OECD (Organisation for Economic Co-operation and Development) & World Bank.** 2021. *Applying the Degree of Urbanisation. A methodological manual to define cities, towns and rural areas for international comparisons. 2021 edition.* Luxembourg, Publications Office of the European Union. https://ec.europa.eu/eurostat/documents/3859598/15348338/KS-02-20-499-EN-N.pdf

6 **European Commission.** 2023. Download the data produced by the GHSL. In: *European Commission | GHSL - Global Human Settlement Layer.* [Cited 9 May 2023]. https://ghsl.jrc.ec.europa.eu/download.php?ds=smod

7 **Global Diet Quality Project.** 2024. *Global Diet Quality Project*. [Cited 25 April 2024]. https://www.dietquality.org

8 **World Bank.** 2024. *International Comparison Program (ICP) - Data*. [Accessed on 24 July 2024]. https://www.worldbank.org/en/programs/icp/data

9 **FAO. 2024.** *FAOSTAT: Consumer Price Indices.* [Accessed on 11 June 2024]. https://www.fao.org/faostat/en/#data/CP. Licence: CC-BY-4.0.

10 **WHO (World Health Organization).** 2014. *Comprehensive implementation plan on maternal, infant and young child nutrition*. Geneva, Switzerland. https://www.who.int/publications/i/item/WHO-NMH-NHD-14.1

11 **WHO.** 2013. *Follow-up to the Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases.* Sixty-sixth World Health Assembly. Geneva, Switzerland. https://apps.who.int/gb/ebwha/pdf_files/WHA66/A66_9-en.pdf

12 **WHO.** 2013. *Global action plan for the prevention and control of noncommunicable diseases 2013-2020*. Geneva, Switzerland. https://iris.who.int/handle/10665/94384

13 **WHO.** 2021. *WHO Discussion Paper on the development of an implementation roadmap 2023-2030 for the WHO Global Action Plan for the Prevention and Control of NCDs 2023-2030.* Geneva, Switzerland. https://www.who.int/publications/m/item/implementation-roadmap-2023-2030-for-the-who-global-action-plan-for-the-prevention-and-control-of-ncds-2023-2030

14 **UNICEF (United Nations Children's Fund).** 2023. Regional classifications. In: *UNICEF*. [Cited 30 April 2024]. https://data.unicef.org/regionalclassifications

15 **GDPRD (Global Donor Platform for Rural Development).** 2011. *Aid to agriculture, rural development: Unpacking aid flows for enhanced transparency, accountability for rural development and food security and aid effectiveness.* Bonn, Germany.

16 **AFSI (L'Aquila Food Security Initiative).** 2012. *L'Aquila Food Security Initiative (AFSI) 2012 Report.* L'Aquila, Italy. https://2009-2017.state.gov/documents/organization/202922.pdf

17 **AFSI.** 2012. *Tracking the L'Aquila Food Security Initiative pledge and related funding.* L'Aquila, Italy. https://2009-2017.state.gov/documents/organization/202955.pdf

18 **Khan, A.A., Pascal, P., Jorand, M., Willoughby, R. & Schäfer, N.A.** 2018. *If not now, then when? Will the Ise-Shima Summit put an end to the poor monitoring of G7 food security investments?* ActionAid, Action contre la Faim, CCFD Terre Solidaire, Oxfam and Welthungerhilfe. https://www.actioncontrelafaim.org/wp-content/uploads/2018/01/if_not_now_then_when_-_will_the_ise-shima_summit_put_an_end_to_the_poor_monitoring_of_g7_food_security_investments_0.pdf

19 **United Nations.** 2015. *G7 commitment regarding hunger and malnutrition.* [Cited 12 June 2024]. https://www.un.org/esa/ffd/ffd3/commitments/commitment/g7-commitment-regarding-hunger-and-malnutrition.html

NOTES

20 **G7 Germany.** 2022. *Elmau Progress Report 2022.* Elmau, Germany. https://www.effectivecooperation.org/system/files/2022-07/Elmau%20Progress%20Report%202022_ENG.pdf

21 **G7 France.** 2019. *Biarritz Progress Report – G7 Development and Development-Related Commitments.* Biarritz, France, Ministry for Europe and Foreign Affairs. https://www.diplomatie.gouv.fr/IMG/pdf/rapport-g7-v8_cle852e6f-1.pdf

22 **G7 Japan.** 2016. *G7 FSWG Chair's Report: Financial Reporting Methodology on Food Security and Nutrition.* Ise-Shima, Japan. https://www.mofa.go.jp/files/000215138.pdf

23 **European Commission.** 2016. *Report from the Commission to the European Parliament and the Council. Implementing EU food and nutrition security policy commitments: second biennial report – Annexes.* Brussels. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SWD:2016:0155:FIN:EN:PDF

24 **OECD, EUROSTAT (Statistical Office of the European Union) & WHO.** 2017. *A System of Health Accounts 2011: Revised edition.* Paris, OECD. http://dx.doi.org/10.1787/9789264270985-en

25 **WHO.** 2014. *WHO: Global Health Expenditure Database.* [Accessed on 9 May 2024]. https://apps.who.int/nha/database/Home/Index/en

26 **FAO.** 2024. *FAOSTAT: Indicators from household surveys (gender, area, socioeconomics).* [Accessed on 29 April 2024]. https://www.fao.org/faostat/en/#data/HS. Licence: CC-BY-4.0.

27 **World Bank.** 2024. *World Bank Data: Households and NPISHs final consumption expenditure (% of GDP).* [Accessed on 29 April 2024]. https://data.worldbank.org/indicator/NE.CON.PRVT.ZS. Licence: CC-BY-4.0.

28 **IPC (Integrated Food Security Phase Classification).** 2021. *Technical Manual Version 3.1. Evidence and standards for better food security and nutrition decisions.* Rome. https://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/manual/IPC_Technical_Manual_3_Final.pdf

29 **FAO, IFAD (International Fund for Agricultural Development), UNICEF, WFP (World Food Programme) & WHO.** 2020. *The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets.* Rome, FAO. https://doi.org/10.4060/ca9692en

30 **FAO, IFAD, UNICEF, WFP & WHO.** 2023. *The State of Food Security and Nutrition in the World 2023. Urbanization, agrifood systems transformation and healthy diets across the rural–urban continuum.* Rome, FAO. https://doi.org/10.4060/cc3017en

31 **FAO, IFAD, UNICEF, WFP & WHO.** 2021. *The State of Food Security and Nutrition in the World 2021. Transforming food systems for food security, improved nutrition and affordable healthy diets for all.* Rome, FAO. https://doi.org/10.4060/cb4474en

32 **FAO, IFAD, UNICEF, WFP & WHO.** 2022. *The State of Food Security and Nutrition in the World 2022. Repurposing food and agricultural policies to make healthy diets more affordable.* Rome, FAO. https://doi.org/10.4060/cc0639en

33 **Davies, S., Pettersson, T. & Öberg, M.** 2023. Organized violence 1989–2022, and the return of conflict between states. *Journal of Peace Research*, 60(4): 691–708. https://doi.org/10.1177/00223433231185169

34 **Sundberg, R. & Melander, E.** 2013. Introducing the UCDP Georeferenced Event Dataset. *Journal of Peace Research*, 50(4): 523–532. https://doi.org/10.1177/0022343313484347

35 **Davies, S., Pettersson, T. & Öberg, M.** 2022. Organized violence 1989–2021 and drone warfare. *Journal of Peace Research*, 59(4): 593–610. https://doi.org/10.1177/00223433221108428

36 **Bai, J. & Perron, P.** 1998. Estimating and testing linear models with multiple structural changes. *Econometrica*, 66(1): 47–78. https://doi.org/10.2307/2998540

37 **World Bank.** 2024. *World Bank DataBank: World Development Indicators.* [Accessed on 14 March 2024]. https://databank.worldbank.org/source/world-development-indicators

38 **FSIN (Food Security Information Network) & GNAFC (Global Network Against Food Crises).** 2024. *Global Report on Food Crises 2024.* Rome. https://www.fsinplatform.org/report/global-report-food-crises-2024

39 **IMF.** 2014. *Government Finance Statistics Manual 2014.* Washington, DC. https://www.imf.org/external/Pubs/FT/GFS/Manual/2014/gfsfinal.pdf

40 **FAO.** 2015. *MAFAP Methodology working paper: Volume II. Analysis of public expenditure on food and agriculture.* MAFAP Technical Notes Series. Rome. https://www.fao.org/fileadmin/templates/mafap/documents/Methodological_Guidelines/METHODOLOGY_WORKING_PAPER_Vol2_Public_Expenditures.pdf

41 World Bank. 2023. *World Bank Data Catalog: Benin BOOST platform: Public expenditure and revenue flows.* [Accessed on 24 July 2024]. https://datacatalog.worldbank.org/search/dataset/0038083. Licence: CC-BY-4.0.

42 **Government of Brazil.** 2024. Orçamento Anual de 2024. In: *gov.br – Ministério do Planejamento e Orçamento.* [Cited 30 April 2024]. https://www.gov.br/planejamento/pt-br/assuntos/orcamento/orcamentos-anuais/2024/orcamento-anual-de2024

43 **Government of Brazil.** 2024. Orçamentos Anuais PLDO I LDO I PLOA I LOA - Atos Normativos. In: *gov.br – Ministério do Planejamento e Orçamento.* [Cited 30 April 2024]. https://www.gov.br/planejamento/pt-br/assuntos/orcamento/orcamento/orcamentos-anuais

44 **Ministry of Finance of Georgia.** 2024. In: *Ministry of Finance of Georgia.* [Cited 30 April 2024]. https://www.mof.ge/en/

45 **Ministry of Finance, Government of India.** 2024. Accounting information. In: *Controller General of Accounts, Department of Expenditure.* [Cited 30 April 2024]. https://cga.nic.in/index.aspx#account-section

46 **Supreme Audit Institution of India.** 2024. In: *Comptroller and Auditor General of India.* [Cited 30 April 2024]. https://cag.gov.in/en

47 **National Treasury & Economic Planning, Republic of Kenya.** 2021. *Sector budget proposal reports.* [Cited 30 April 2024]. https://www.treasury.go.ke/sector-budget-proposal-reports

48 **Federal Government of Mexico.** 2024. Investor Relations Office of the Ministry of Finance and Public Credit. In: *Gobierno de México.* [Cited 9 May 2024]. https://www.finanzaspublicas.hacienda.gob.mx/es/Finanzas_Publicas/Ingles

49 **Federal Government of Nigeria.** 2024. *Federal Government of Nigeria.* [Cited 30 April 2024]. https://opentreasury.gov.ng

50 **Republic of the Philippines, Department of Budget and Management.** 2022. *Budget of expenditures and sources of financing FY 2023.* Manila. https://www.dbm.gov.ph/index.php/2023/budget-of-expenditures-and-sources-of-financing-fy-2023

51 **Republic of South Africa, National Treasury Department.** 2024. Estimates of national expenditure. In: *National Treasury.* [Cited 30 April 2024]. https://www.treasury.gov.za/documents/national%20budget/2024/Estimates.aspx

52 **Republic of South Africa, National Treasury Department.** 2024. National budget. In: *National Treasury.* [Cited 30 April 2024]. https://www.treasury.gov.za/documents/national%20budget/default.aspx

53 **World Bank.** 2023. *World Bank Data Catalog: Uganda BOOST Public Expenditure Database.* [Accessed on 24 July 2024]. https://datacatalog.worldbank.org/search/dataset/0038076. Licence: CC-BY-4.0.

54 **OECD.** 2024. Official development assistance – definition and coverage. In: *OECD.* [Cited 25 March 2024]. https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/officialdevelopmentassistancedefinitionandcoverage.htm

55 **OECD.** 2024. Frequently asked questions: official development assistance (ODA). In: *OECD.* [Cited 25 March 2024]. https://www.oecd.org/en/data/insights/data-explainers/2024/07/frequently-asked-questions-on-official-development-assistance-oda.html

56 **OECD.** 2024. *OECD: OECD Data Explorer: Official Devlopment Assistance (ODA).* [Accessed on 24 July 2024]. https://data-explorer.oecd.org/?fs[0]=Topic%2C1%7CDevelopment%23DEV%23%7COfficial%20Development%20Assistance%20%28ODA%29%23DEV_ODA%23&pg=0&fc=Topic&bp=true&snb=11

57 **OECD.** 2024. Development Assistance Committee (DAC). In: *OECD.* [Cited 25 March 2024]. https://www.oecd.org/dac/development-assistance-committee

58 **OECD.** 2024. Development finance of countries beyond the DAC. In: *OECD.* [Cited 25 March 2024]. https://www.oecd.org/dac/dac-global-relations/non-dac-reporting.htm

59 **AidData.** 2024. In: *AidData.* [Cited 25 March 2024]. https://www.aiddata.org

NOTES

60 **OECD.** 2024. Total Official Support for Sustainable Development (TOSSD). In: *OECD*. [Cited 25 March 2024]. https://www.tossd.org

61 **COBRADI (Operação Brasileira para o Desenvolvimento Internacional).** 2021. Ipea – Instituto de Pesquisa Econômica Aplicada. In: *gov.br.* [Cited 30 May 2024]. https://www.ipea.gov.br/portal/cobradi

62 **Schleicher, R. & Barros, P.** 2022. Medindo o gasto externo brasileiro para a implementação da agenda 2030: O novo COBRADI 2021-2024. *Boletim de Economia e Política Internacional,* 139–160. https://doi.org/10.38116/bepi33art5

63 **OECD.** 2022. OECD development co-operation profiles: Canada. In: *OECDiLibrary*. [Cited 1 May 2023]. https://www.oecd-ilibrary.org/sites/aa7e3298-en/index.html?itemId=/content/component/aa7e3298-en

64 **World Bank & KNOMAD (Global Knowledge Partnership on Migration and Development).** 2023. *Leveraging diaspora finances for private capital mobilization.* Migration and Development Brief 39. Washington, DC. https://www.knomad.org/sites/default/files/publication-doc/migration_development_brief_39_0.pdf

65 **IFAD.** 2017. *Sending money home: Contributing to the SDGs, one family at a time.* Rome. https://www.ifad.org/documents/38714170/40187440/sending-money-home_e.pdf/7601a70c-68f0-3637-2517-da0f77506aa8?t=1707298178938

66 **World Bank.** 2024. *World Bank Data: Agriculture, forestry, and fishing, value added (% of GDP).* [Accessed on 24 July 2024]. https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS. Licence: CC-BY-4.0.

67 **UNCTAD (United Nations Trade and Development).** 2023. *World Investment Report 2023. Methodological note.* Geneva, Switzerland. https://unctad.org/system/files/official-document/wir2023_chMethodNote_en.pdf

68 **OECD.** 2009. *OECD benchmark definition of foreign direct investment 2008.* Fourth Edition. Paris. https://doi.org/10.1787/9789264045743-en

69 **Viné, R., Sulstarova, A., Casella, B. & Trentini, C.** 2022. International project finance deals as indicators of productive cross-border investment: UNCTAD's approach. *Transnational Corporations Journal*, 29(3): 161–185. https://ssrn.com/abstract=4311329

70 **Convergence.** 2023. *State of Blended Finance 2023: Climate edition.* Toronto, Canada. https://www.convergence.finance/resource/state-of-blended-finance-2023/view

71 **Multilateral Development Banks & Development Finance Institutions.** 2023. *Mobilization of private finance 2020+2021 joint report.* https://www.ifc.org/content/dam/ifc/doc/2023-delta/mdbs-joint-report-on-mobilization-of-private-finance-2020-21.pdf

72 **World Bank.** 2024. World Bank Country and Lending Groups. In: *World Bank*. [Cited 9 May 2024]. https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

73 **World Bank.** 2024. Debt Sustainability Framework (DSF). In: *World Bank*. [Cited 9 May 2024]. https://www.worldbank.org/en/programs/debt-toolkit/dsf

74 **IMF.** 2022. *Staff guidance note on the sovereign risk and debt sustainability framework for market access countries.* Policy Paper No. 2022/039. Washington, DC. https://www.imf.org/en/Publications/Policy-Papers/Issues/2022/08/08/Staff-Guidance-Note-on-the-Sovereign-Risk-and-Debt-Sustainability-Framework-for-Market-521884

75 **World Bank.** undated. *World Bank Data: Short-term debt (% of total reserves).* [Accessed on 9 May 2024]. https://data.worldbank.org/indicator/DT.DOD.DSTC.IR.ZS?end=2022&start=2022&view=map. Licence: CC-BY-4.0.

76 **World Bank.** 2024. Metadata glossary. In: *DataBank*. [Cited 9 May 2024]. https://databank.worldbank.org/metadataglossary/world-development-indicators/series/DT.DOD.DSTC.IR.ZS

77 **World Bank.** 2023. Worldwide Governance Indicators. In: *World Bank*. [Cited 2 May 2024]. https://www.worldbank.org/en/publication/worldwide-governance-indicators

78 **World Bank.** undated. *Voice and accountability.* Washington, DC. https://www.worldbank.org/content/dam/sites/govindicators/doc/va.pdf

79 **World Bank.** undated. *Government effectiveness.* Washington, DC. https://www.worldbank.org/content/dam/sites/govindicators/doc/ge.pdf

80 **World Bank.** undated. *Regulatory quality.* Washington, DC. https://www.worldbank.org/content/dam/sites/govindicators/doc/rq.pdf

81 **World Bank.** undated. *Rule of law.* Washington, DC. https://www.worldbank.org/content/dam/sites/govindicators/doc/rl.pdf

82 **World Bank.** undated. *Control of corruption.* Washington, DC. https://www.worldbank.org/content/dam/sites/govindicators/doc/cc.pdf

83 **World Bank.** 2024. Digital Adoption Index. In: *World Bank*. [Cited 3 June 2024]. https://www.worldbank.org/en/publication/wdr2016/Digital-Adoption-Index

84 **Jeanne, O. & Rancière, R.** 2006. *The optimal level of international reserves for emerging market countries: Formulas and applications.* IMF working paper. Washington, DC, IMF. https://www.imf.org/external/pubs/ft/wp/2006/wp06229.pdf

85 **Bai, Y., Conti, V., Ebel, A., Cafiero, C., Herforth, A., Rissanen, M.O., Rosero Moncayo, J. & Masters, W.A.** (forthcoming). *Methods for monitoring the cost of a healthy diet based on price data from the International Comparison Program*. FAO Statistics Division Working Paper. Rome, FAO.

THE STATE OF THE WORLD

2024

THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD

FINANCING TO END HUNGER, FOOD INSECURITY AND MALNUTRITION IN ALL ITS FORMS

Six years away from 2030, hunger and food insecurity trends are not yet moving in the right direction to achieve the goal of ending hunger and food insecurity (SDG Target 2.1) by 2030. The indicators of progress towards global nutrition targets similarly show that the world is not on track to eliminate all forms of malnutrition (SDG Target 2.2). Billions of people still lack access to nutritious, safe and sufficient food. The challenges are many, but progress in many countries provides hope that it is possible to get back on track towards a world free of hunger and malnutrition.

Previous editions of this report have identified the major drivers and underlying structural factors behind these trends and provided evidence-based policy recommendations to revert them, which have been grouped into six transformative pathways that countries can adopt, depending on the drivers and factors they are facing.

However, transiting through any of the six transformative pathways will require proper financing for food security and nutrition, the theme of this year's report. Although there is a broad agreement on the urgent need to increase financing for food security and nutrition, the same cannot be said for a common understanding regarding how this financing should be defined and tracked. This year the report provides a long-awaited definition of financing for food security and nutrition and guidance for its implementation.

The report underlines that the data available are not enough to provide a full picture of the current financing flows that are contributing to meet SDG Targets 2.1 and 2.2 and of the gap that must be filled to fully meet them by 2030. The data for global official development flows are standardized and public, but a comprehensive and comparable analysis of global public spending on food and agriculture is challenged by data gaps, and private financing flows for food security and nutrition are even more difficult to track.

The report provides timely and relevant recommendations regarding the efficient use of innovative financing tools and reforms to the food security and nutrition financing architecture. Establishing a common ground on how food security and nutrition financing is defined, along with methods for its tracking, measurement and implementation, is an important first step towards sustainably increasing the financing flows needed to end hunger, food insecurity and all forms of malnutrition, and to ensure access to healthy diets for all, today and tomorrow. To this end, insights of this report are particularly important in light of the next Summit of the Future in September 2024 and the Fourth International Financing for Development Conference in June and July 2025.

The State of Food Security and Nutrition in the World 2024 (full report)