



SDG 2: Zero Hunger



Overview

Agriculture,
forestry and
fisheries

Nutritious
food for all

Generate
decent
incomes

Support rural
development

Protect the
environment



<http://www.fao.org/bodies/council/cl151/side-events/s02/fr/>

<https://www.un.org/sustainabledevelopment/hunger/>



Hunger Facts

821 million people were undernourished in 2017

Poor nutrition causes nearly half (45 per cent) of deaths in children under five – 3.1 million children each year

12.9 per cent of the population is undernourished

149 million children under 5 years of age—22 per cent of the global under-5 population—were still chronically undernourished in 2018.

<https://www.un.org/sustainabledevelopment/hunger/>



Food Security Facts

Agriculture is the single largest employer in the world, providing livelihoods for 40 per cent of today's global population

500 million small farms worldwide, most still rainfed, provide up to 80 per cent of food consumed in a large part of the developing world

Since the 1900s, some 75 per cent of crop diversity has been lost from farmers' fields. Better use of agricultural biodiversity can contribute to more nutritious diets, enhanced livelihoods for farming communities and more resilient and sustainable farming systems.

If women farmers had the same access to resources as men, the number of hungry in the world could be reduced by up to 150 million.

<https://www.un.org/sustainabledevelopment/hunger/>



2.1 Nutritious Food For All

Target

- By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, **nutritious and sufficient food** all year round

Indicator

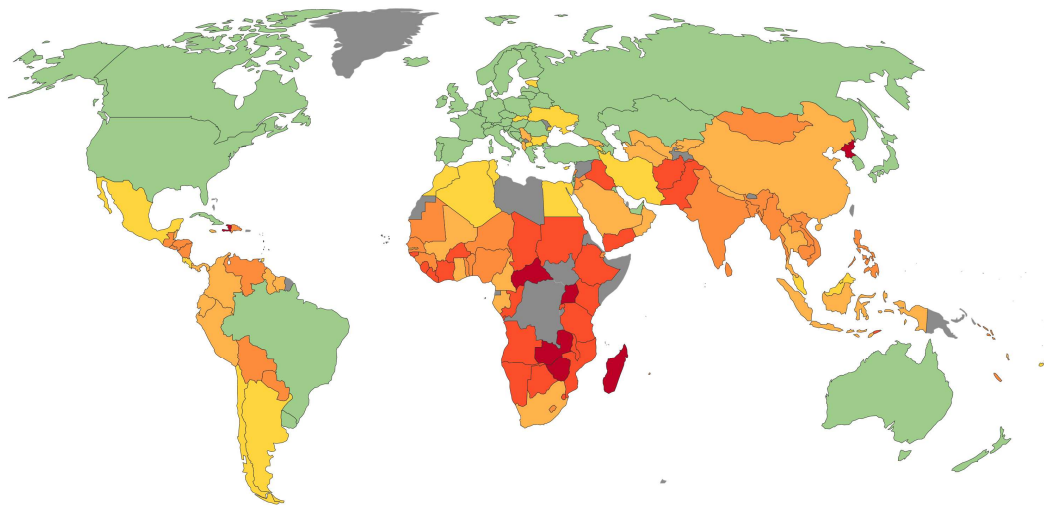
- Prevalence of undernourishment
- Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale

<https://sustainabledevelopment.un.org/sdg2>

Share of the population that is undernourished, 2016

This is the main FAO hunger indicator. It measures the share of the population that has a caloric intake which is insufficient to meet the minimum energy requirements necessary for a given individual. Countries with undernourishment under 2.5% are automatically given a value of 2.5%.

Our World
in Data

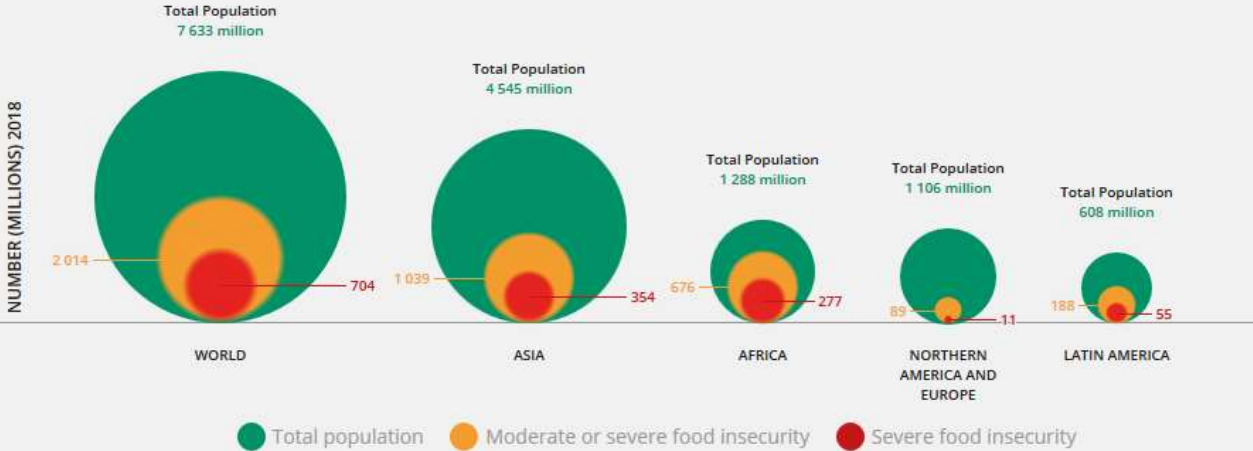


Most insufficient in Africa, percentage jumps drastically

Source: UN Food and Agriculture Organization (FAO)

OurWorldInData.org/hunger-and-undernourishment/ • CC BY

Prevalence of Moderate and Severe Food Insecurity in the population



SOURCE: FAO.

Worldwide percentage of moderate food insecurity: 26%

FOOD INSECURITY BASED ON THE FIES: WHAT DOES IT MEAN?





2.2 End all Malnutrition

Target

- By 2030, **end all forms of malnutrition**, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons

Indicator

- Prevalence of stunting (height for age < -2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age
- Prevalence of malnutrition (weight for height $> +2$ or < -2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)

<https://sustainabledevelopment.un.org/sdg2>

Malnutrition

STUNTING

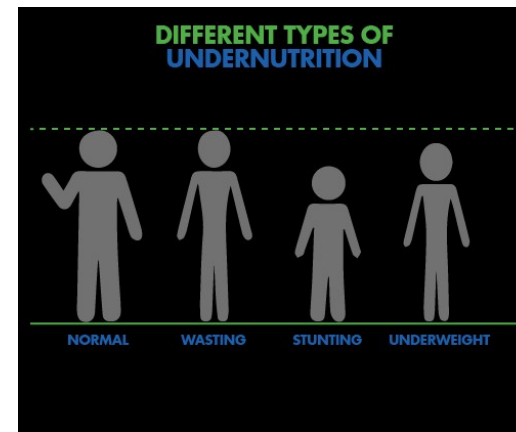
Height for age <-2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards



<https://borgenproject.org/what-causes-stunting/>

WASTING OR OVERWEIGHT

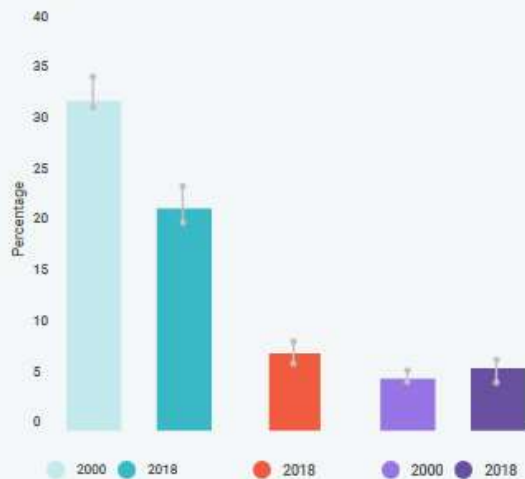
Weight for height $>+2$ or <-2 standard deviation from the median of the WHO Child Growth Standards



<https://www.worldvision.org/category/hunger-news-stories>

Prevalence

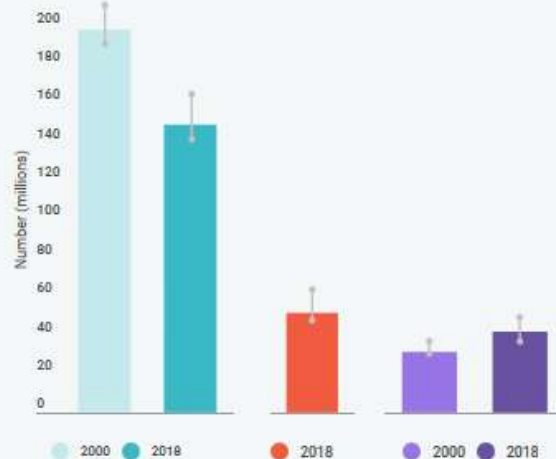
Percentage of stunted, wasted and overweight children under 5, global, 2000 and 2018



 Stunting  Wasting  Overweight  95% confidence intervals

Numbers affected

Number (millions) of stunted, wasted and overweight children under 5, global, 2000 and 2018



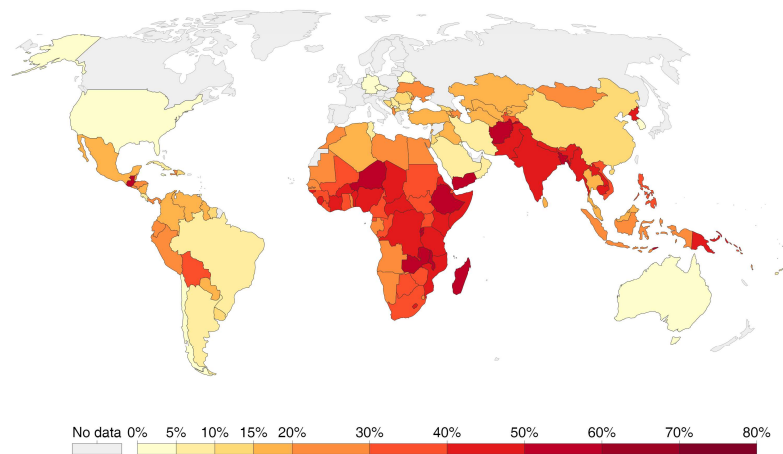
Source: UNICEF/WHO/World Bank Joint Child Malnutrition Estimates, March 2019 edition.

Note: The total number of wasted children under 5 is 49.48 million; this becomes 49 million when rounded to the nearest integer (as on the cover page), and 49.5 million when rounded to the nearest tenth.

- Worldwide change from 32 to 23% stunted
- Increase in Overweight

Share of children who are stunted, 2004

Share of children younger than 5 years that fall below two standard deviations from the median height-for-age of the WHO Child Growth Standards. When data for the indicated year is not available the closest observation is shown (within a tolerance of 5 years).

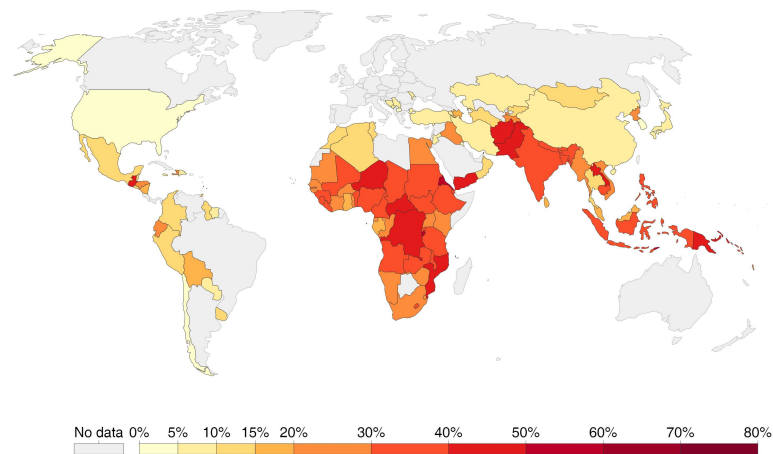


Source: UNICEF/WHO

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Share of children who are stunted, 2015

Share of children younger than 5 years that fall below two standard deviations from the median height-for-age of the WHO Child Growth Standards. When data for the indicated year is not available the closest observation is shown (within a tolerance of 5 years).



Source: UNICEF/WHO

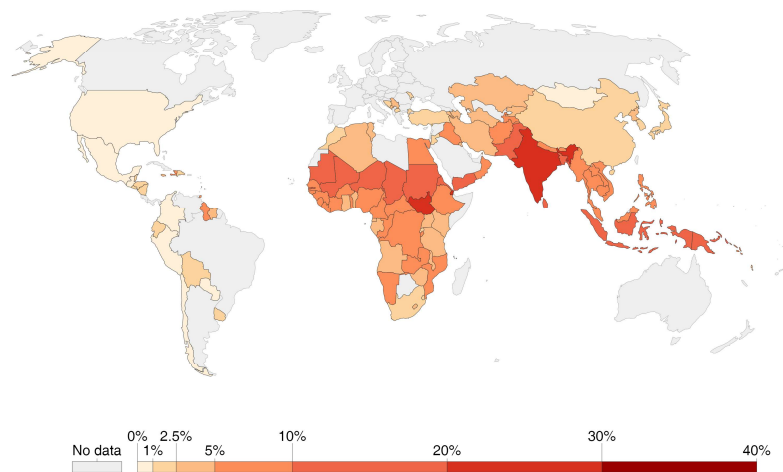
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Stunting

- From 2004 to 2015, percentage of children under 5 decreased in Asia (from ranges of 20-30% to 10-15%)
- Decrease in Sub-Saharan Africa from ranges of 50 to 70% to 40-50% generally
- Decrease seen in available data of South America

Share of children with a weight too low for their height ('wasting'), 2015

Prevalence of 'wasting' is the proportion of children younger than 5 years whose weight for height is more than two standard deviations below the median for the international reference population ages 0-59.

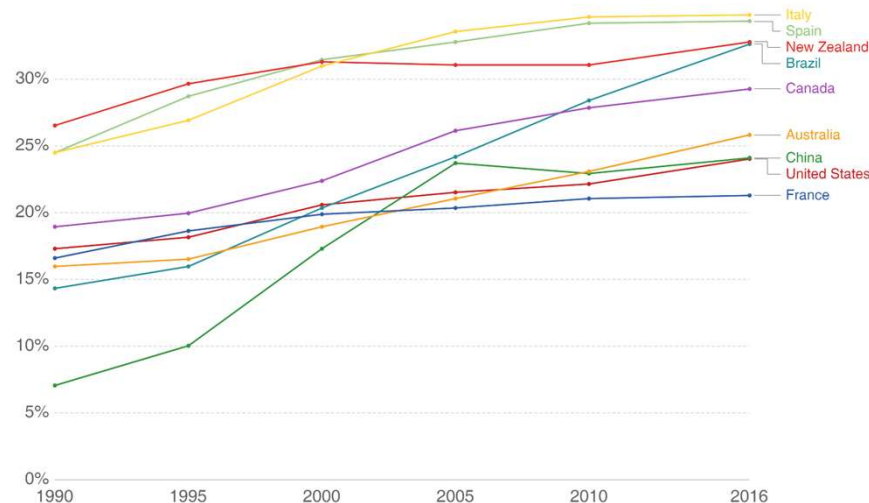


Source: World Bank

OurWorldInData.org/hunger-and-undernourishment/ • CC BY

Share of children who are overweight

Percentage of children aged 2-4 years old who are defined as overweight (weight-for-height more than two standard deviations from the median of the World Health Organization (WHO) Child Growth Standards).



Source: Institute of Health Metrics and Evaluation (IHME)

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Developed countries have overweight children and developing have underweight



2.3 Double Income of Small-scale Food Producers

Target

- By 2030, **double the agricultural productivity and incomes of small-scale food producers**, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment

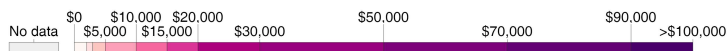
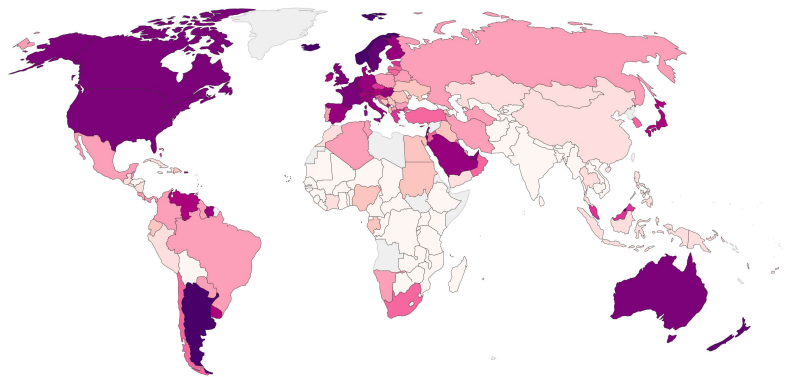
Indicator

- Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size
- Average income of small-scale food producers, by sex and indigenous status

<https://sustainabledevelopment.un.org/sdg2>

Agriculture value added per worker, 2008

Agriculture value added per worker is a measure of labor productivity. It corresponds to the ratio between value added in agriculture (constant 2010 US\$) and number of people employed in agriculture.

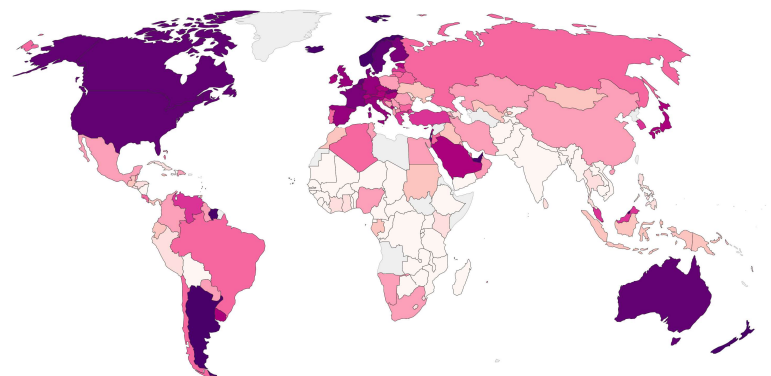


Source: World Bank

OurWorldInData.org/employment-in-agriculture • CC BY

Agriculture value added per worker, 2016

Agriculture value added per worker is a measure of labor productivity. It corresponds to the ratio between value added in agriculture (constant 2010 US\$) and number of people employed in agriculture.



Source: World Bank

OurWorldInData.org/employment-in-agriculture • CC BY

- Scale is the amount of money (value) added per worker employed in agriculture in that country per year
- More value overall, particularly Asia and South America
- However, increases in developed nations indicate the modern practices of mass single-crop (monoculture) farming using chemical herbicides and pesticides



2.4 Sustainable Agriculture Practices

Target

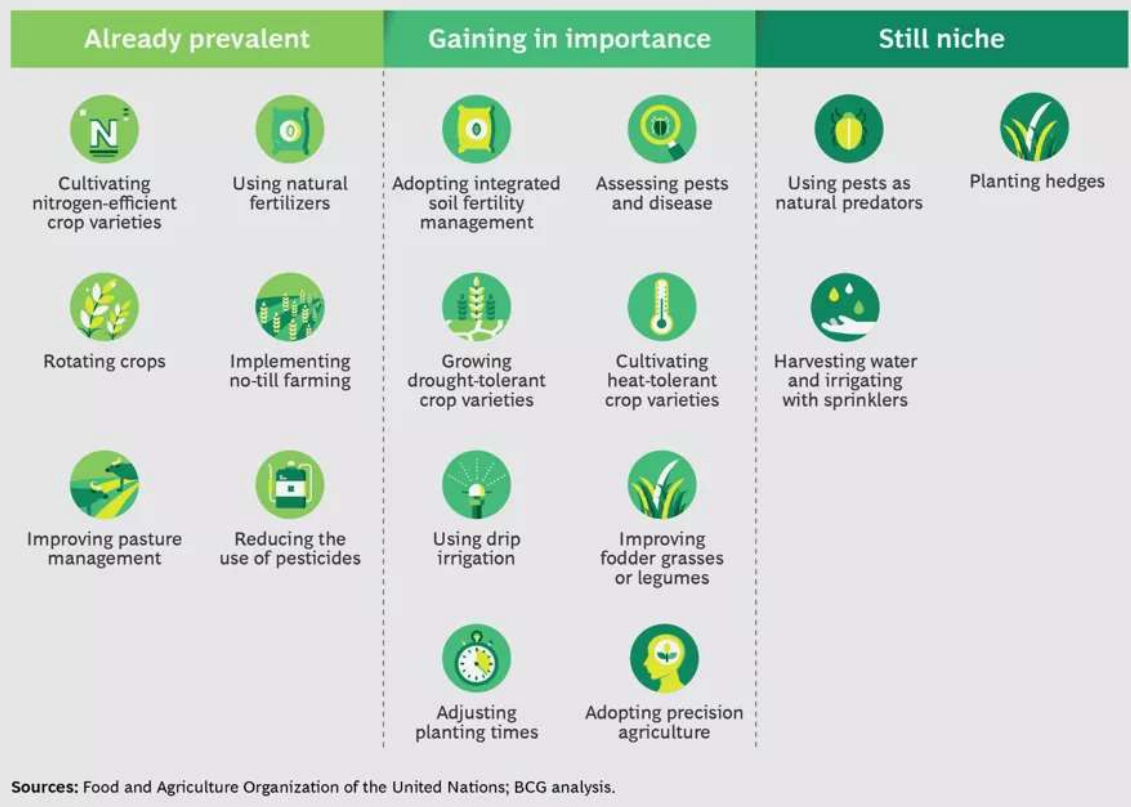
- By 2030, **ensure sustainable food production systems** and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality

Indicator

- Proportion of agricultural area under productive and sustainable agriculture

<https://sustainabledevelopment.un.org/sdg2>

EXHIBIT 4 | Some Sustainable Farming Methods Are Used More Than Others



Soil Quality

- Rotating crops
- No-till
- Soil management

Water Usage

- Quality of soil^
- Drip irrigation
- Drought tolerant
- Harvesting water

Pollution

- Fertilizers
- Pesticides

How Monoculture Is Detrimental

Eliminates biodiversity

- No range of insects
- No variation of plants or ground cover crops that improve nutrient quality of soil

Uses chemicals to replace nature

- Synthetic herbicides, insecticides, bactericides, and fertilizers
- Traces on plants and enters our water supply
- Health effects such as immune suppression, hormone disruption, diminished intelligence, reproductive abnormalities and cancer (Aktar 2009)

Water Use

- Diminished soil -> more water has to be used, straining our water resources (and then usually pollutes it)

Fossil Fuels

- Harvesting, packaging, and transportation since these large farms transport all over the country and beyond = extraordinary amounts of energy and thus extreme amounts of emissions contributing to climate change



<https://www.treehugger.com/green-food/6-ways-agriculture-impacts-global-warming.html>

Also people who eat government subsidized crops (which are incentivized to be monoculture by producing as much as possible) have worse health outcomes
-37 percent higher risk of obesity
-corn for corn syrup, soybeans for oil

Siegel KR, McKeever Bullard K, Imperatore G, et al. Association of Higher Consumption of Foods Derived From Subsidized Commodities With Adverse Cardiometabolic Risk Among US Adults. *JAMA Intern Med.* 2016;176(8):1124–1132. doi:10.1001/jamainternmed.2016.2410

<https://regenerative.com/six-problems-monoculture-farming/>

Aktar MW, Sengupta D, Chowdhury A. Impact of pesticides use in agriculture: their benefits and hazards. *Interdiscip Toxicol.* 2009;2(1):1–12. doi:10.2478/v10102-009-0001-7



2.5 Save Diverse Food and Equitable Sharing

Target

- By 2020, **maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals** and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed

Indicator

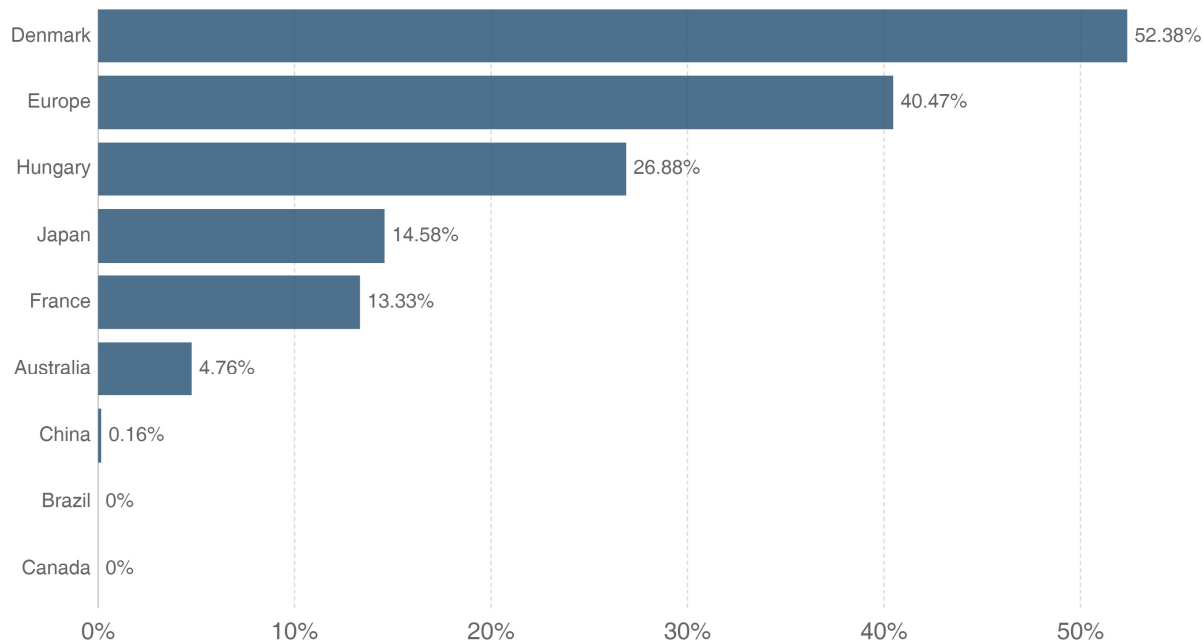
- Number of plant and animal genetic resources for food and agriculture secured in either medium or long-term conservation facilities
- Proportion of local breeds classified as being at risk, not-at-risk or at unknown level of risk of extinction

<https://sustainabledevelopment.un.org/sdg2>

Proportion of local livestock breeds classified as being at risk of extinction, 2017

Our World
in Data

Share of local livestock breeds which are classified as being at risk of extinction. Breed-related information remains far from complete. For almost 60 percent of all reported breeds, risk status is not known because of missing population data or lack of recent updates.



Source: UN Food and Agriculture Division (FAO)

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Local breeds at risk because the easiest to raise and sell are the commercial choice
Ex: Broad Breasted White Turkey vs heritage turkeys

Having a single breed and lack of diversity has threat of a single disease wiping them all out



2.A Investment

Target

- Increase **investment**, including through enhanced international cooperation, in **rural infrastructure, agricultural research and extension services**, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries

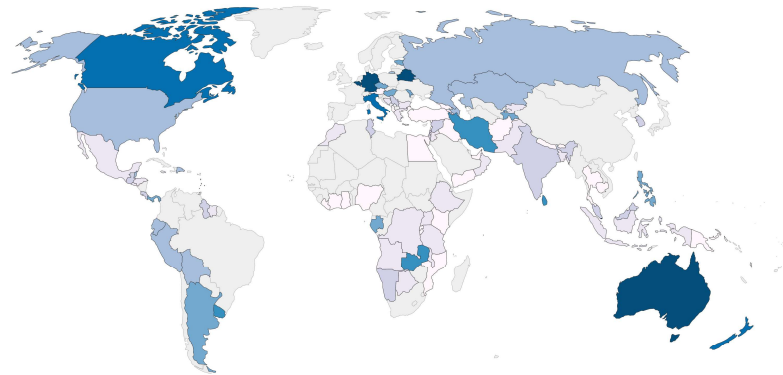
Indicator

- The agriculture orientation index for government expenditures
- Total official flows (official development assistance plus other official flows) to the agriculture sector

<https://sustainabledevelopment.un.org/sdg2>

Agriculture orientation index for government expenditures, 2010

Agriculture Orientation Index (AOI) is defined as the agriculture share of government expenditures, divided by the agriculture share of GDP. An AOI >1 means the agriculture sector receives a higher share of government spending relative to its economic value. An AOI <1 reflects a lower orientation to agriculture.

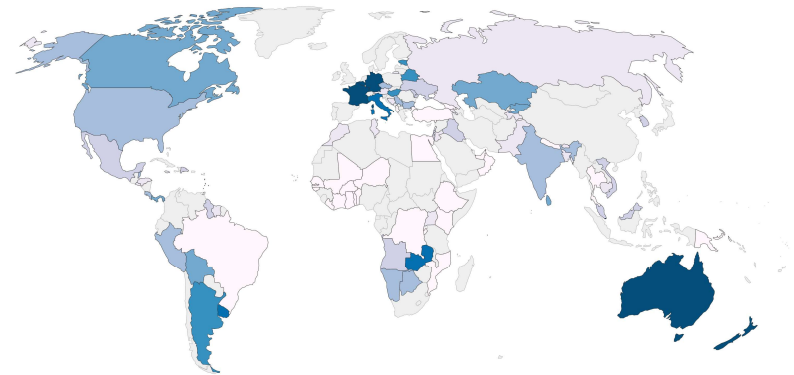


Source: UN and Food Agriculture Organization FAO)

CC BY

Agriculture orientation index for government expenditures, 2015

Agriculture Orientation Index (AOI) is defined as the agriculture share of government expenditures, divided by the agriculture share of GDP. An AOI >1 means the agriculture sector receives a higher share of government spending relative to its economic value. An AOI <1 reflects a lower orientation to agriculture.



Source: UN and Food Agriculture Organization FAO)

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Percentage of government spending on agriculture

- Ranging from 0 to 3%, all very low
- Little change



2.B Prevent Trade Restrictions

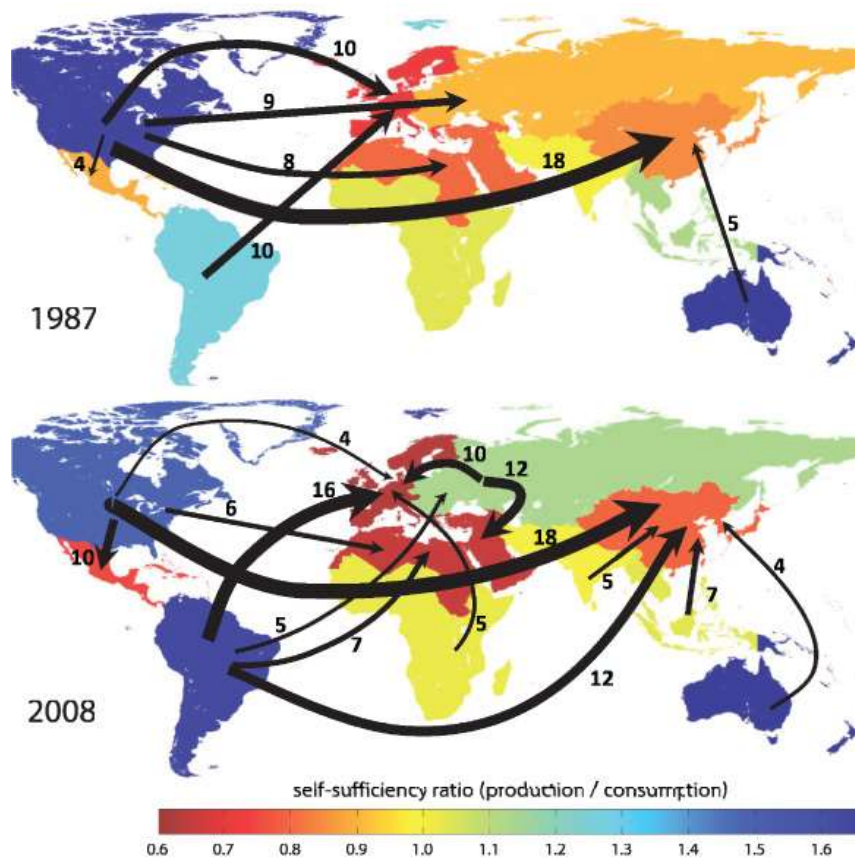
Target

- Correct and **prevent trade restrictions and distortions in world agricultural markets**, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round

Indicator

- Producer Support Estimate
- Agricultural export subsidies

<https://sustainabledevelopment.un.org/sdg2>



- Cool colored countries have the climate, soil, and land for creating an excess of food for export
- Trade is necessary for countries to supplement their more limited production
- Yellow to green should be nearing self-sufficiency without export, but Africa is not importing and lacking food needed

<https://iopscience.iop.org/article/10.1088/1748-9326/9/3/034015>



2.C Prevent Extreme Changes in Prices

Target

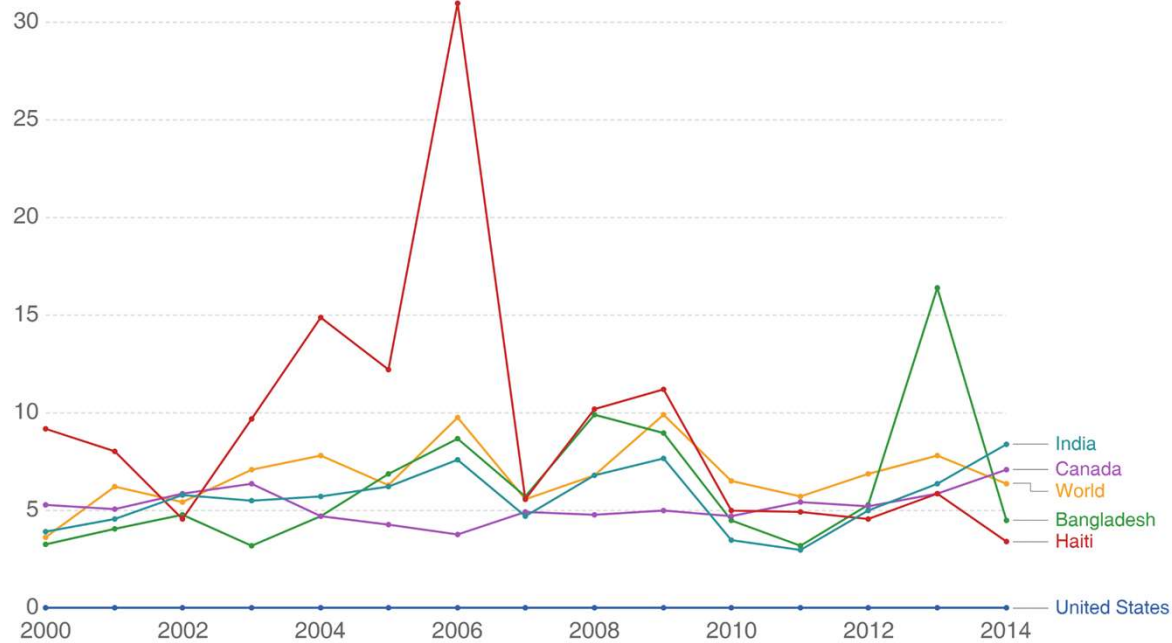
- Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help **limit extreme food price volatility**

Indicator

- Indicator of food price anomalies

Domestic food price volatility index

Domestic food price volatility index measures the variation (volatility) in domestic food prices over time - this is measured as the weighted-average of a basket of commodities based on consumer or market prices. High values indicate a higher volatility (more variation) in food prices.



Source: UN Food and Agricultural Organization (FAO)

OurWorldInData.org/food-prices/ • CC BY

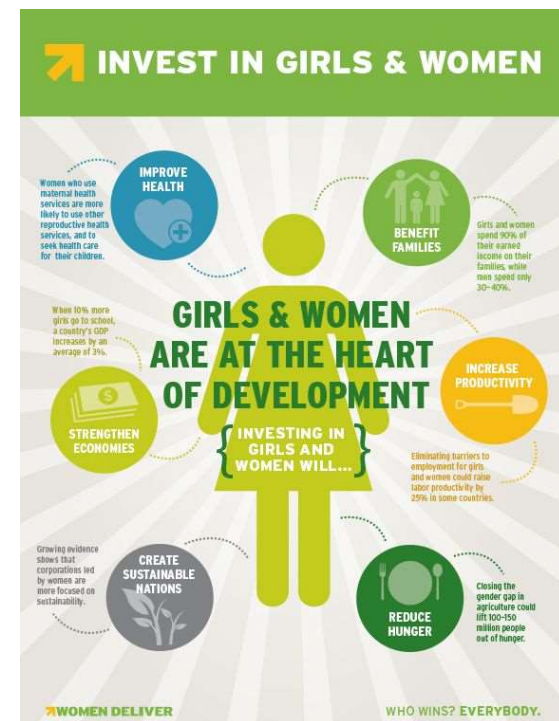
- Shows the variation in food prices
- Stability is key for dependable access to food and prevent food insecurity



Investing in Women

The Hunger Project

- **women routinely invest significant portions of their income in food, healthcare and education for their families**
 - Provide access to microfinance.
 - Empower elected women representatives
 - Promote community leadership roles for women
 - Celebrate and empower girls in Bangladesh
 - Halt the spread of HIV/AIDS through education and awareness building



<https://www.thp.org/issues/gender-discrimination/>



Urban Farming

- By 2030, two-thirds of the world's population will be living in cities, with the urban population in developing countries doubling
- [Thomson Reuters Foundation](#) explained from the study, "Urban farms could supply almost the entire recommended consumption of vegetables for city dwellers, while cutting food waste and reducing emissions from the transportation of agricultural products."
- Other Positive effects
 - Increases vegetation cover (thus contributing to a decrease in the urban heat island intensity)
 - Improves the livability of cities
 - Provides enhanced food security to more than half of Earth's population



Local Urban Farming

Bonton Farms

- Created to bring jobs and nutrition to an impoverished area (half below poverty line in Bonton)
- Most have been to jail and need jobs
- 40-acre center with a market and resources that help residents pursue job opportunities, open businesses, maintain housing stability, and provide education to their families

<https://www.dmagazine.com/publications/d-magazine/2018/february/bonton-farms-south-dallas-daron-babcock/>



We Over Me Farm

- Paul Quinn College- work/study university in efforts to alleviate poverty
- Converted football field to a community garden
- The produce from the garden contributed to starting a farmers market and grocery store in the area
- Previously a food desert

<https://www.dallasnews.com/food/2019/03/19/paul-quinn-college-promises-bigger-and-bolder-plan-for-its-we-over-me-farm/>



Big Tex Urban Farms

- Started in Fair Park
- Makes more than 6,000 fruits and vegetables. Has 520 boxes, a 15x30-foot deep water culture bed capable of producing more than 20,000 greens a year, and various community locations throughout South Dallas
- Donates to Baylor Scott & White Health and Wellness Institute in the Mill City neighborhood, Cornerstone Baptist Church, and Austin Street Shelter among others

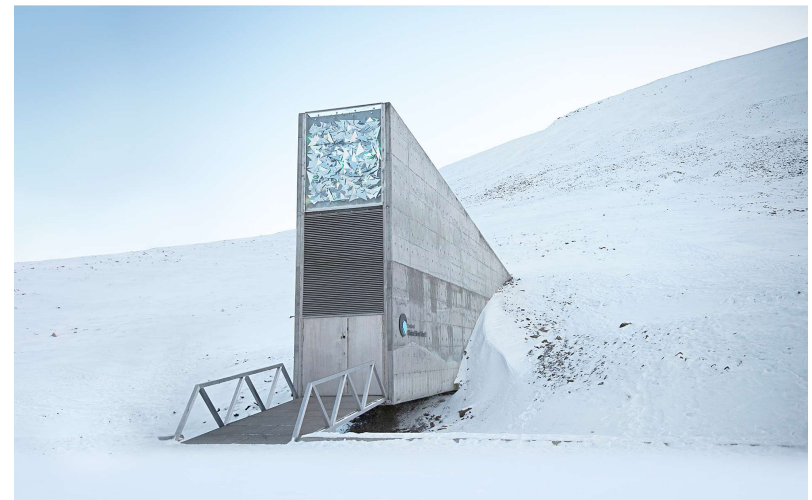
<https://bigtex.com/supporting-texans/big-tex-urban-farms/>





Svalbard Global Seed Vault

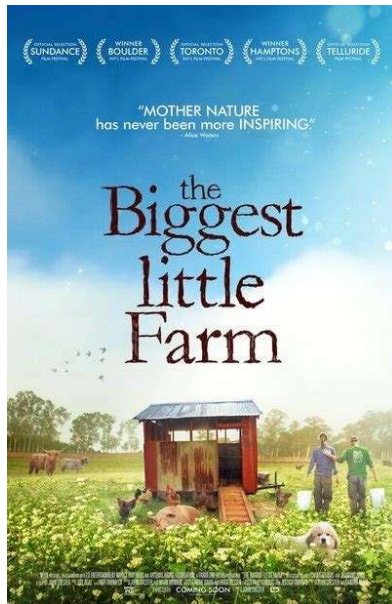
- “It is a long-term seed storage facility, built to stand the test of time — and the challenge of natural or man-made disasters. The Seed Vault represents the world’s largest collection of crop diversity.”
- Most diverse collection
- Permafrost and thick rock ensure that the seed samples will remain frozen even without power
- 983,524 samples stored
- Great podcast:
<https://99percentinvisible.org/episode/the-vault/>



<https://www.croptrust.org/our-work/svalbard-global-seed-vault/>

Recommended Media

A couple's story implementing traditional farming methods in California and how it saves water, promotes biodiversity, and uses no chemicals



A quirky recollection of only growing or buying food from within 100 miles for a year and the environmental and health benefits from it

