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IFAD International Fund for Agricultural Development
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LATIN AMERICA AND THE CARIBBEAN

REGIONAL OVERVIEW OF FOOD SECURITY AND NUTRITION

BUILDING RESILIENCE TO CLIMATE VARIABILITY AND EXTREMES FOR FOOD SECURITY AND NUTRITION

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FOREWORD

Achieving the Sustainable Development Goals (SDGs) of the 2030 Agenda requires a comprehensive plan to eradicate hunger and malnutrition while building more just, equitable and sustainable societies.

In the last two years, Latin America and the Caribbean has shown signs of improvement in existing social protection policies together with the economic recovery and poverty reduction that several countries in the region have contributed to the reduction of the prevalence of hunger and food insecurity. However, hunger remains a significant challenge with figures higher than those observed prior to the COVID-19 pandemic, which is an indication of the long way to go.

This report highlights the substantive differences that persist in addressing this challenge within the region. While South America has made progress in reducing hunger, Mesoamerica has not seen significant changes, and the Caribbean has the highest prevalence of hunger in the region. These differences could be explained, in part, by the high climate vulnerability, the need to continue strengthening resilience in agrifood systems and a dependence on food imports. In addition, the report shows the effects of structural inequalities on food insecurity, which are most prevalent among women and rural populations in the region as a whole.

The current scenario is complex. Countries face conflicts, economic crises, social inequality, and limited access to and unaffordability of healthy diets, which hamper the reduction of hunger, food insecurity and malnutrition. Furthermore, climate variability and extreme weather disproportionately affect the most vulnerable such as children and adolescents, women, Indigenous and Afro-descendant communities and people living in rural areas.

Globally, six of the nine planetary boundaries that regulate the Earth's stability and habitability for people have been exceeded in the region, which means that climate variability and extreme weather will occur more frequently and with greater intensity. This unpredictability increases the risk for agrifood systems. Our region is no exception.

For that reason, the 2024 edition of the Regional Overview of Food Security and Nutrition pays special attention to the association between climate variability and extreme weather, and hunger, food insecurity and malnutrition, underlining that Latin America and the Caribbean is the region with the second-highest exposure to extreme climate events globally, surpassed only by Asia.

According to the report, 74 percent of the countries in the region have high exposure to climate extremes, which means that these events occur with high frequency and intensity. In addition, 52 percent of countries can be defined as vulnerable to these events because they have a higher probability that their production, cereal imports, or prevalence of undernourishment will be negatively affected by extremes. These types of events further weaken agrifood systems, intensify food insecurity and significantly increase the risk of malnutrition, especially among those populations in situations of vulnerability as they affect food availability, prices and access to healthy diets.

Furthermore, it cannot be ignored that all this occurs in a context of stagnation in the reduction of stunting in children under 5 years of age since the COVID-19 pandemic, an increase in overweight among children of the same age, rising obesity rates in adults, and where the cost of healthy diets is the highest in the world.

Climate variability and extremes require the attention of governments of Latin America and the Caribbean to ensure that the reduction in the prevalence of hunger, food insecurity and malnutrition in all its forms continues as a priority as we move forward to accelerate the achievement of the SDG targets throughout the region by 2030.

The 2024 Regional Overview of Food Security and Nutrition provides data, evidence and recommendations to support more effective regional cooperation, to encourage the implementation of the Plan for Food Security, Nutrition and the Eradication of Hunger 2030 of the Community of Latin American and Caribbean States (CELAC), and to contribute to the development of the G20's Alliance Against Hunger and Poverty. This report aims to support governments of Member States, civil society, academia, and the private sector to take the necessary actions to reduce the impact of climate-related risks and promote the transformation of agrifood systems.

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ABBREVIATIONS

AMS	American Meteorological Society
ASI	Agricultural Stress Index
BMI	body mass index
CARICOM	Caribbean Community
CDB	Caribbean Development Bank
CELAC	Community of Latin American and Caribbean States
CFNI	Caribbean Food and Nutrition Institute
CoAHD	cost and affordability of a healthy diet
CoHD	Cost of a healthy diet
CPI	consumer price index
CRU	Climate Research Unit of the University of East Anglia
ECLAC	United Nations Economic Commission for Latin America and the Caribbean
ENSO	El Niño Southern Oscillation
EWS	early-warning system
FAO	Food and Agriculture Organization of the United Nations
FBDG	food-based dietary guidelines
FSBDG	food systems-based dietary guidelines
FFS	Farmer Field School
FIES	Food Insecurity Experience Scale
FPMA	Food Price Monitoring and Analysis Tool
FSBDG	food systems-based dietary guidelines
FSIS	Food Security Information Systems
FSN	food security and nutrition
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gases
GIEWS	Global Information and Early Warning System on Food and Agriculture
GWP	Gallup World Poll
HLPE	High Level Panel of Experts
IBGE	Brazilian Institute of Geography and Statistics
ICF	Integrated Food Security Phase Classification
ICP	International Comparison Program (World Bank)
IDB	Inter-American Development Bank

IFPRI	International Food Policy Research Institute
IFAD	International Fund for Agricultural Development
IISD	International Institute for Sustainable Development
IPC	Integrated Food Security Phase Classification
IPCC	Intergovernmental Panel on Climate Change
IPPC	International Plant Protection Convention
IUCN	International Union for Conservation of Nature
IWISE	Individual Water Insecurity Experiences
MSME	micro, small and medium enterprises
NDCs	nationally determined contributions
NDVI	Normalized Difference Vegetation Index
NFIDC	net food-importing developing countries
PAHO	Pan American Health Organization
PARLATINO	Latin American Parliament
PoU	prevalence of undernourishment
PPP	purchasing power parity
SDC	Swiss Agency for Development and Cooperation
SDGs	Sustainable Development Goals
SICA	Central American Integration System
SPEI	Standardized Precipitation and Evapotranspiration Index
TFA	Trade Facilitation Agreement
UNFCCC	United Nations Framework Convention on Climate Change
UNDRR	United Nations Office for Disaster Risk Reduction
UNEP	United Nations Environment Programme
UNGA	United Nations General Assembly
UNHCR	United Nations Human Rights Council
UNICEF	United Nations Children's Fund
UNSDG	United Nations Sustainable Development Group
USD	United States Dollar
WFP	World Food Programme
WHA	World Health Assembly
WHO	World Health Organization
WTO	World Trade Organization

EXECUTIVE SUMMARY

This report presents the latest updates on food security and nutrition indicators, as well as an overview of the progress made towards achieving Target 2.1, to end hunger and ensure access for all people to safe, nutritious and sufficient food all year round, and Target 2.2, to eradicate all forms of malnutrition, of the Sustainable Development Goals (SDGs). The latest estimates show that in Latin America and the Caribbean hunger and food insecurity have decreased for two years in a row. Despite these improvements, significant disparities remain among subregions, disproportionately affecting the most vulnerable populations, while hunger levels remain higher than those prior to the COVID-19 pandemic. In addition, while the affordability of a healthy diet has improved, the region still has the highest cost compared to other regions and is not on track to meet most nutrition targets.

The State of Food Security and Nutrition in the World 2024 warned that the world is far from ending hunger and achieving SDG 2, Zero Hunger by 2030, and that progress in the fight against hunger has been set back 15 years. It also revealed that, for the second consecutive year, Latin America and the Caribbean is the only region that showed a decrease in the prevalence of undernourishment and in moderate and severe food insecurity. This is explained by the progress achieved in South America that is linked to the economic recovery after the COVID-19 pandemic and to public spending on social protection programmes, which increased income and mitigated hunger among the most vulnerable population.

The 2024 edition of the *Latin America and the Caribbean Regional Overview of Food Security and Nutrition* focuses on the potential impact that climate variability and extremes could have on food security and nutrition. These threats, such as drought, flooding and storms are major drivers exacerbating food security and nutrition challenges, impacting the four dimensions of food security (availability, access, utilization and stability), as well as contributing to other underlying causes of malnutrition.

These factors, along with others such as conflicts, economic slowdowns and downturns combined with well-established underlying factors —such as the lack of access to and unaffordability of healthy diets, unhealthy food environments and high and persistent inequality— further worsen the negative effects on food security and nutrition. A diverse portfolio of policies and actions will be required to accelerate the transformation of agrifood systems. It will also require a comprehensive, intersectional, rights-based and systemic approach that considers people's livelihoods, promotes access to and affordability of healthy diets and strengthens the resilience of agrifood systems.

The report urgently calls for accelerated action to build resilience within agrifood systems to safeguard the region's progress towards eliminating hunger and malnutrition while ensuring its sustainability.

It also highlights that Latin America and the Caribbean is the region with the second-highest exposure to extreme climate events globally after Asia. In the region, 74 percent of countries have a high exposure to these events, which means they occur with a high frequency, and 52 percent are vulnerable to these effects.

Climate variability and extremes reduce agricultural productivity, disrupt food supply chains, increase food prices and affect food environments. They also make healthy diets less affordable and accessible, particularly for populations in vulnerable conditions, while also changing the dietary habits of the affected population. Urgent action is needed to accelerate and scale up efforts to strengthen resilience in response to climate variability and extremes to transform agrifood systems and meet SDG Targets 2.1 and 2.2. Strengthening resilience in agrifood systems is critical to prevent setbacks in food security and nutrition and to avoid worsening the nutritional situation in the region.

Food security and nutrition in Latin America and the Caribbean

Sustainable Development Goals Target 2.1: Undernourishment and food insecurity

After significant increases between 2019 and 2021, the prevalence of undernourishment in the world has remained practically unchanged for three consecutive years. In 2023, it was estimated that 9.1 percent of the population, or 733.4 million people, suffered from hunger, representing an increase of about 152 million people since 2019. However, in Latin America and the Caribbean, notable progress has been made over the past two years. In 2023, the prevalence of undernourishment in the region was estimated at 6.2 percent, which is significantly lower than the global estimate and down from 6.6 percent in 2022. Nevertheless, this figure remains slightly above the pre-pandemic levels of 2019.

In 2023, an estimated 41 million people in the region were undernourished, which represents a reduction of 2.9 million people compared to 2022 (0.4 percentage point) and 4.3 million people compared to 2021 (0.7 percentage point), after a sharp increase of nearly 6 million people between 2019 and 2020.

Despite regional progress, there are significant disparities among subregions. The prevalence of undernourishment has been on the rise for the past two years in the Caribbean (to 17.2 percent), while it has remained relatively unchanged in Mesoamerica (5.8 percent) and has decreased in South America (to 5.2 percent), while hunger remains above pre-pandemic levels in the three subregions.

Like undernourishment, the prevalence of food insecurity has remained relatively unchanged globally in recent years. In 2023, moderate or severe food insecurity affected 28.9 percent of the global population, while the prevalence of severe insecurity reached 10.7 percent. However, considerable progress has been made in Latin America and the Caribbean. In 2023, moderate or severe food insecurity affected 28.2 percent of the population (187.6 million people), which is the first time in recent years that the regional prevalence is below the global average by 0.7 percentage point. Compared to 2022, this represents a decrease of 3.2 percentage points (equivalent to 19.7 million fewer people affected) and a decrease of 6.1 percentage points compared to 2021 (equivalent to 40.2 million fewer people). Severe food insecurity affected 8.7 percent of the population (58.1 million people) in 2023, showing a decrease of 2.3 percentage points (14.4 million fewer people) from the previous year and a reduction of 3.4 percentage points compared to 2021 (21.5 million fewer people).

In 2023, the prevalence of moderate or severe food insecurity in the three subregions decreased compared to the previous year. While South America (25.1 percent) and Mesoamerica (28.2 percent) have a lower prevalence of moderate or severe food insecurity than the world average, the Caribbean has a prevalence of 58.8 percent, which is significantly higher than the global average. A similar trend is observed for severe food insecurity, except for a slight increase in the Caribbean (0.5 percentage point from 2022).

Food insecurity continues to disproportionately impact some subgroups of the population. In Latin America and the Caribbean, the gender gap was 5.2 percentage points for moderate or severe food insecurity and 1.4 percentage points for severe food insecurity, both above the world average gap. Furthermore, rural populations are more impacted compared to urban populations. The prevalence of moderate or severe food insecurity was 6.2 percentage points higher in rural areas of the region.

This improvement in undernourishment and food insecurity can be attributed to several factors. The economic recovery of several countries in the region, marked by increasing employment levels, decreased poverty and extreme poverty, and benefits from energy price increases observed after the COVID-19 pandemic, particularly for energy-exporting countries. Furthermore, solid social protection systems allowed countries in the region to respond quickly to changes, which is especially important in times of financial restrictions. These factors directly impact food access, undernourishment and food insecurity.

Sustainable Development Goals Target 2.2: Malnutrition

Significant progress has been made in reducing stunting among children under 5 years of age in Latin America and the Caribbean, with the prevalence declining from 17.8 percent in 2000 to 11.5 percent in 2022. However, the rate of decline has slowed in recent years, and the region is not on track to achieve SDG Target 2.2. Also, significant differences are observed across subregions: Mesoamerica reports the highest prevalence of stunting at 16.9 percent, followed by the Caribbean (11.3 percent) and South America (9 percent).

In 2022, the prevalence of wasting among children under 5 years of age in Latin America and the Caribbean was 1.4 percent, significantly lower than the global estimate of 6.8 percent. All subregions and most countries are on track to achieve this SDG target by 2030, which aims to maintain wasting levels below 3 percent.

However, the region is off track to achieve SDG 2 related to overweight in children under 5 years. This prevalence has been increasing, affecting 8.6 percent in 2022 (4.2 million children), which is 3 percentage points above the global estimate. Furthermore, between 2012 and 2022, the regional estimate of overweight among children has increased faster than the world average (1.2 percentage points versus 0.1 percentage point). The increase is largely driven by South America (9.7 percent), compared to a more stable trend in both Mesoamerica and the Caribbean.

In 2019, anaemia affected 17.2 percent of women aged 15 to 49 years in the region, equivalent to 29.6 million women in this age group. While the regional prevalence is significantly below the world average of 29.9 percent, subregional disparities persist with the Caribbean showing the highest prevalence at 29.2 percent, followed by South America (17.3 percent) and Mesoamerica (14.6 percent). Looking at the trend of this indicator since 2000, the prevalence of anaemia has decreased in all subregions, but this progress has come to a halt from 2014 onwards in the region and is off track to achieve the SDG indicator 2.2.3 of reducing the prevalence by 50 percent.

Additional World Health Assembly nutrition indicators

New data on the prevalence of obesity among adults shows a steady increase over the past 20 years. In Latin America and the Caribbean, the prevalence is nearly double the global estimate of 15.8 percent, reaching 29.9 percent of the adult population in the region in 2022, equivalent to 141.4 million people. Over the last decade, the prevalence has risen by 7.5 percentage points, affecting an additional 50 million people. All three subregions have observed increases: Mesoamerica has the highest prevalence (34.4 percent), followed by South America (28.6 percent) and the Caribbean (24.5 percent).

Significant progress has been made in promoting exclusive breastfeeding for infants under 6 months of age since 2012. However, the region remains below the global estimate and far from achieving the 2030 target of 70 percent. In 2022, the regional prevalence was estimated at 43.1 percent, with Mesoamerica showing the largest improvement, nearly doubling the percentage of infants exclusively breastfed compared to 2012.

Estimates from 2020 show that Latin America and the Caribbean had a lower prevalence of low birthweight than the global estimate positioning at 9.6 percent versus 14.7 percent globally. Additionally, no significant variation has been observed for this indicator since 2000. Among subregions, the Caribbean has the highest prevalence (11.7 percent), followed by Mesoamerica (10.9 percent) and South America (8.8 percent).

Updates to the cost and affordability of a healthy diet

The cost of a healthy diet (CoHD) indicator provides national-level estimates of the cost of acquiring the cheapest possible healthy foods in each country, defined as a diet comprising a variety of locally available foods that meet energy and key nutritional requirements. Moreover, the CoHD is compared with national income distributions to estimate the prevalence of unaffordability and the number of people unable to afford a healthy diet.

In this version of the report, all indicators related to the cost and affordability of a healthy diet are updated as of 2022, with new food price data and some methodological changes that resulted in more accurate estimates of the affordability of a healthy diet.

The CoHD has risen worldwide since 2017, the first year for which FAO published these estimates. Latin America and the Caribbean had the highest cost of a healthy diet in 2022, estimated at 4.56 purchasing power parity (PPP) dollars per person per day, above the global average of 3.96 PPP dollars. Among the subregions, the Caribbean has the highest cost at 5.16 PPP dollars per person per day, followed by South America (4.29 PPP dollars), and Mesoamerica (4.05 PPP dollars). The latest data, which corresponds to 2022, shows a 26.3 percent increase in the cost of a healthy diet for the region compared to 2017.

Although the CoHD had been rising, the proportion of the population unable to afford a healthy diet in Latin America and the Caribbean decreased by 2.4 percentage points in 2022, meaning 14.3 million more people could afford a healthy diet compared to 2021. However, 27.7 percent of the region's population (182.9 million people) still could not afford a healthy diet in 2022. In the Caribbean, 50 percent of the population could not afford a healthy diet, followed by Mesoamerica (26.3 percent) and South America (26 percent). The improvement in affordability was primarily driven by progress in South America.

Despite the reduction of hunger and the improvement of food security in the region, the increase in the cost of a healthy diet and the uneven progress in economic access to healthy diets have cast a shadow over the possibility of achieving Zero Hunger in Latin America and the Caribbean.

The effects of climate variability and extremes on food security and nutrition

The 2021 edition of The State of Food Security and Nutrition in the World presented an analysis of the major drivers that explain the current food security and nutrition trends globally. Among these drivers are conflict, climate variability and extremes, and economic slowdowns and downturns, combined with underlying structural factors, such as the unaffordability of healthy diets, growing inequalities and unhealthy food environments. These major drivers are increasing in frequency and intensity, often occurring simultaneously with interactions that create multiple compounding impacts on agrifood systems that seriously undermine food security and nutrition.

To retain the recent decreases in hunger and reduced food insecurity, and to address the slow progress in eliminating all forms of malnutrition in Latin America and the Caribbean will require additional policies and actions focused on the main determinants of food security and nutrition. These should focus on increasing the resilience of agrifood systems to disruptions caused by the main determinants (conflict, climate variability and extreme weather events, economic slowdown and recession). In addition, it is crucial to address the underlying structural factors already mentioned, which amplify the negative impact of the determinants on food security and nutrition.

Climate variability and extremes, exacerbated by climate change, pose important challenges for food security and nutrition now and in the future. Climate variability refers to variations in the mean state and other statistics of climate on all spatial and temporal scales beyond that of individual weather events. Climate extreme is the occurrence or a value of a weather or climate variable above or below a threshold value near the upper or lower ends of the range of observed values of the variable. Many weather extremes are the result of natural climate variability (BOX 1).

As in other regions of the world, the percentage of countries affected by climate extremes in Latin America and the Caribbean is significantly higher than those affected by other drivers. According to The State of Food Security and Nutrition in the World 2024, 20 countries in the region have high exposure to extreme climate events and 14 also have high vulnerability to climate variability and extremes, which has an important impact on food security and nutrition in these countries.

Accelerating progress towards food security and nutrition will require evidence-based policies and actions that promote the transformation of agrifood systems to strengthen countries' climate resilience.

Climate variability and extremes in Latin America and the Caribbean

Recent evidence shows a rise in global temperatures and changes in weather and precipitation patterns, leading to more frequent and intense climate extremes across the region, including drought, flooding and storms. Also, very hot days are becoming more frequent and maximum temperatures in the region are increasingly higher. Specifically, the proportion of countries exposed to three or four different types of climate extremes rose from 11 percent in the period 2003–2007 to 44 percent in 2018–2022. Among the countries analysed, 20 had high exposure to climate extremes in the period 2013–2018.

The evolving patterns of climate variability and extreme conditions are one of the major drivers of recent food insecurity and malnutrition trends, and they also exacerbate other underlying causes of malnutrition. Between 2019 and 2023, the prevalence of undernourishment increased by 1.5 percentage points in countries affected by climate variability and extremes. The situation is worse in those countries simultaneously experiencing other disruptions such as conflicts and economic downturns.

Climate variability and extremes and the dimensions of food security

Climate variability and extremes may affect food availability decreasing production and productivity. This forces people and countries to develop other strategies to be able to maintain their levels of food supply without major disruptions. Although the impacts in the agriculture sector are mainly observed on crops and livestock, they also present important challenges for other sectors since they threaten the livelihoods of the producers.

Climate extremes produce crop losses and reduce agricultural output in a major food-producing region. Crop yields depend on climate, damage to crops can be observed in the long term, reducing the overall supply of agricultural products.

The impacts on national food production are not homogenous due to variations in climate variability and extremes, as well as differences in cropping patterns, farming technologies and agriculture management systems. Heterogeneous effects are observed at the subnational level, which depend on a combination of factors such as soil conditions, crop types, precipitation levels and the economic development of the territory.

Although these events may not affect the entire national food production and food supply chain, they can have a significant impact on family farmers and small-scale producers. The vulnerability of farms to climate risks varies based on factors such as labour shortages, poor post-harvest infrastructure, lack of transport links, technical and financial assistance, and insufficient conservation practices affecting innovative capacities and adaptability.

A study that analysed production data of a group of crops in relation to an index that estimates precipitation and evapotranspiration levels in Brazil, Chile and Mexico showed associations between climate variability and crop yield. In most cases, a reduction in yield was recorded for the crops studied, although differences in this effect were observed between the countries and territories considered.

Climate variability and extremes often lead to increased food prices, which is primarily due to reduced production and general disruptions in the food supply chain. The latter affects the purchasing power of households by reducing their access to food. In addition, those people whose livelihoods are affected by extreme climate events may also experience a reduction in their income, considering that livelihood assets, including economic, human, physical, natural and social capital, are essential for generating their incomes. In both cases, people may face food insecurity and change dietary patterns, moving from the consumption of nutritious food to more processed foods, thereby affecting their food security and nutrition.

The impact of these events is particularly severe on rural populations and family farming, a key sector for food security in Latin America and the Caribbean. Extreme climate events directly threaten the livelihoods of rural people who are less able to recover due to the precariousness of infrastructure and public services, as well as the informality of employment. In some cases, the loss of income and livelihoods can lead to the sale of productive assets, thereby limiting access strategies for future income for smallholders.

Recent studies also highlight that climate variability and extremes have effects on price volatility. For example, during the spring and summer phases of the El Niño Southern Oscillation phenomenon, corn prices significantly increased. The vulnerability of prices to climate variability affects the region in a heterogeneous manner, with most cases of monthly food costs and the consumer price index (CPI) exceeding the average indicator during extreme periods. The impact of price increases depends on income levels, with low- and middle-income countries facing a greater impact. Initial food price shocks may be exacerbated by other shocks such as fuel prices, job and income losses, stock accumulation and export restrictions.

It is worth mentioning that during an extreme climate event, the reduction in access to food may be related to more than just economic factors and might also relate to physical access. One of the several impacts of these events are the disruptions affecting critical infrastructure, including roads, transportation, markets, energy and water, among others. The disruptions could lead to difficulties in physical access to all kinds of food or certain types of food, and could result in food insecurity, undernourishment and different forms of malnutrition.

Reduced availability and increased food prices resulting from climate variability and extreme events can disrupt dietary patterns and reduce diet quality. Metabolism and energy intake can also be affected, due to changes in lifestyle and well-being that occur as a result of these events. Furthermore, contamination of food, vectors or water that can result from such events further aggravates food insecurity. Climate variability and extremes could also affect nutrition through diseases such as vector-borne diseases like malaria and dengue. These diseases can negatively affect nutritional status, especially in vulnerable children. Low-income households are more susceptible to undernutrition or nutrient deficiencies. Children, especially those suffering from stunting, are particularly vulnerable to extreme climate events. High exposure to climate extremes increases children's vulnerability to malnutrition with the first 1 000 days of life being crucial for long-term nutrition and health outcomes. Extreme heat can cause heat stress, affecting pregnant women's physiological processes, leading to foetal malnutrition, premature birth and low birthweight. In addition, pregnant and lactating women's nutritional status significantly impacts childbirth, childbirth outcomes and infant health.

Climate extremes can also affect physical activity and sleep patterns, causing changes in metabolism and energy expenditure and potentially having an adverse impact on human health and nutrition. Food safety is also affected by climate variability and extremes, affecting food security and the nutritional quality of diets. These events can lead to increased mortality rates in newborns and undernutrition in children under 5 years of age.

Finally, the stability dimension aims to ensure that household food security is maintained on a constant basis. To achieve this, it is essential that the three dimensions of availability, access and utilization are adequately covered, with stability in each of them. Climate variability and extreme events represent a threat to this stability, as they directly affect the other dimensions. Stability problems can be observed in the short term, affecting acute food insecurity, or in the long term, causing chronic food insecurity.

The extent to which climate variability and extremes negatively affect people's food security and nutrition status depends on their degree of exposure and vulnerability to climate shocks and stress. Some countries in the region are more exposed and have greater vulnerability to extreme climate events, meaning that their food stability is more threatened than that of other countries, with greater effects on their food security and nutrition.

Finally, it is important to note that a country is considered to be affected by climate variability and extreme events if it experiences a combination of high exposure to extreme events and climate-related vulnerability. A study conducted between 2013 and 2022 reveals that 20 countries in the region had high exposure to extreme events, while 14 countries were defined as vulnerable due to potential impacts on their production, cereal imports or prevalence of undernourishment. Of these, 13 countries were affected by extreme events.

Strengthening resilience in agrifood systems to enhance food security and nutrition in a context of climate variability and extremes

The intensification of major drivers of food insecurity and malnutrition, such as climate variability and extremes, combined with conflicts, economic slowdowns and downturns, and the well-established underlying factors that contribute to food insecurity and malnutrition, will require a diverse portfolio of policies and actions to accelerate the transformation of agrifood systems to make them more efficient, inclusive, resilient and sustainable.

The agrifood sector faces multidimensional challenges arising from climatic conditions. These include the need to sustainably provide sufficient, accessible, affordable, safe and nutritious foods that contribute to healthy diets, as well as other raw materials, bioenergy, processed products and services, while controlling emissions, biodiversity loss, desertification, environmental degradation and water insecurity.

Additionally, the impacts of extreme climate events disproportionately affect specific population subgroups. Those already facing poverty, inequality, or marginalization, including family farmers, small-scale producers, women, children, older adults, socially isolated individuals, Indigenous Peoples, Afro-descendants, and migrants, are particularly at risk. Prolonged or recurrent climate extremes lead to diminished coping capacities and loss of livelihoods and, therefore, are detrimental to food security and nutrition.

This edition of the Latin America and the Caribbean Regional Overview of Food Security and Nutrition calls for a more comprehensive portfolio of policies and interventions that both build resilience against disruptions to agrifood systems caused by climate variability and extremes and address the underlying structural factors that exacerbate the negative impacts of the major drivers. To address climate variability and extremes, this portfolio should contribute to developing the five capacities for resilience building (anticipate, prevent, absorb, adapt and transform), which are central to enabling the transformation of agrifood systems. A holistic approach is necessary to tackle not only the direct impacts of climate variability and extremes on food security and nutrition, but also the underlying factors.

This requires the integration of measures for strengthening climate resilience, with special attention to vulnerable groups that face differentiated and exacerbated climate impacts. Vulnerability is more critical in areas dominated by high dependence on climate-sensitive livelihoods, poverty, governance challenges and limited access to basic services and resources, among other factors.

This edition highlights a set of policies and interventions being implemented in different countries of Latin America and the Caribbean, including those directly related to climate variability and extremes and their impacts on production and food supply chains, such as people-centred and multi-hazard early-warning systems and anticipatory action, as well as climate-resilient, sustainable and diversified agricultural production in order to ensure a more stable and nutritionally diverse food supply, and environmental sustainability. It suggests actions for strengthening the capacities of small-scale producers in climate-resilient agricultural production to reduce the risk of productive losses and maintain stable incomes and livelihoods. It also examines the diversification of the food supply of importing countries to draw on international markets in situations of domestic supply shortages.

In addition, this report presents initiatives aimed at increasing the access to and the affordability of healthy diets, and at creating healthier food environments such as food systems-based dietary guidelines, school feeding programmes and fiscal subsidies.

Finally, the report includes policies and actions related to nutrition-sensitive social protection programmes and agricultural insurance as a risk transfer mechanism for family farmers and small-scale producers.

The effective implementation of these policies requires robust governance to enable the development of resilient agrifood systems and the achievement of SDG 2. Due to the complexity of the growing interactions between food security and nutrition and climate variability and extremes, the report highlights the need for an integrated work and research agenda that addresses these interrelated issues. This report seeks to orient and provide information to policymakers, donors, the international development community and the private sector to move quickly in times of need.

Interventions to reduce the impacts of climate variability and extremes on food production and supply chains

Sustainable agriculture and post-farm practices are needed to enable resilient food supply chains that ensure a stable food flow from producers to consumers, promote employment and provide markets with healthy food. Good practices for reducing the impact of climate variability and extremes include early-warning systems, climate-resilient agricultural production, strengthening the capacities and coordination of small-scale producers and micro, small and medium enterprises (MSMEs) to provide a diversified and safe food supply. These strategies help agrifood systems to absorb, adapt or transform before shocks occur, thereby preventing extreme poverty and hunger.

People-centred and multi-hazard early-warning systems are essential for anticipatory action and are responsible for monitoring and detecting climate risks, providing strategies to mitigate imminent impacts while guaranteeing food security and nutrition. Climate-resilient, sustainable and diversified food supply chains are less vulnerable to climate variability and extremes, helping to ensure a more stable and nutritionally diverse food supply as well as healthy ecosystems. The strong capacities of small-scale producers, family farmers and MSMEs are a key factor in the mitigation of the risks posed by climate variability and extremes by enhancing their ability to adapt, thus reducing the impacts on food supply. Moreover, the diversification of the food supply in importing countries is vital for agrifood systems resilience, allowing countries to access international markets during supply shortages.

Interventions to promote healthier consumer behaviour by enhancing access to and affordability of healthy diets

The actions to reduce the impacts of climate variability and extremes on food production and supply chains must be complemented by interventions improving access to and affordability of healthy diets and policies for healthy food environments. Many factors within the food environment determine dietary patterns. One example is school feeding programmes combined with food and nutrition education, which could shape children's consumption patterns, affecting their lives beyond the school and possibly reduce inequalities.

School feeding programmes benefitted around 80.3 million children in 31 countries in 2022. These public policies aim to improve health, nutrition, education, human capital and local agriculture as well as create healthier food environments that: a) promote healthier consumer behaviours; b) enhance access to and affordability of nutritious foods; and c) reduce inequalities. These programmes can enhance the resilience of agrifood systems by incorporating public purchases from family farmers including local and seasonal fruits and vegetables, into school menus. Some countries have improved the nutritional quality of school menus by introducing a greater quantity of fruits and vegetables, and reducing sodium, fat and sugar, as well as implementing culturally appropriate menus. Despite facing challenges in the context of the COVID-19 pandemic, school feeding programmes have demonstrated their capacity for supporting the resilience, flexibility and adaptability of local food supply chains and for shifting consumption patterns.

Interventions to create healthier food environments to ensure food security and nutrition

Healthy food environments are crucial for food security and nutrition as they influence access, affordability, safety and preferences related to food. Aspects such as culture, language, culinary practices, knowledge, consumption patterns, beliefs and values all influence food production and consumption. Implementing the policies that strengthen healthy food environments is essential to promote dietary changes and encourage sustainable production practices. The impacts of climate variability and extremes, as in the case of other major drivers, are worsened by underlying structural factors such as unhealthy food environments. In this regard, the transition to more sustainable agrifood systems that promote healthy diets is a pathway towards adaptation and, consequently, greater climate resilience.

An example of interventions at this level considers the national food-based dietary guidelines (FBDGs) that aim to localize the principles of a healthy diet (adequacy, balance, diversity and moderation) taking into account local food practices, culture and traditions. Food systems-based dietary guidelines (FSBDGs) are developed or updated using the latest evidence on the country's public health and nutrition priorities, sociocultural factors, and local food availability (such as seasonality of food production) and access, as well as gender and life cycle approaches. In the region, 28 out of 33 countries have developed FBDGs, but these are not aligned with the Paris Agreement and other environmental targets. These guidelines can be developed or updated with a food-systems approach and consider environmental aspects of food production and processing such as greenhouse gas (GHG) emissions. FSBDGs aim to promote healthy diets, environmental sustainability, reduce inequalities by informing policies to create a better food supply, better food environments and encourage better dietary behaviours. To support countries, FAO has developed the FSBDGs methodology. By developing national FSBDGs involving productive and environmental sectors, countries can encourage the adoption of healthy diets at the population level, promote environmental sustainability and reduce inequalities.

Social protection systems that support the climate resilience of agrifood systems and help reduce inequality

While water and health systems are essential for food security and nutrition in the context of climate variability and extremes, this report focuses on social protection measures such as financial support and agricultural insurance as risk transfer mechanisms. This is due to the urgent need to build resilient capacities in populations in vulnerable conditions that are more exposed to adverse climate impacts such as small-scale producers and family farmers.

Social protection is a vital tool for poverty reduction, reducing inequalities and promoting inclusive rural development. It aims to prevent vulnerability and social exclusion throughout a person's life cycle and is essential for climate resilient development. Social protection does so by providing financial and material support to vulnerable populations, helping them mitigate risks, strengthen livelihoods and improve food security. In climate-vulnerable contexts, where rural communities face increased risks from extreme weather events, social protection systems can be designed to offer both immediate relief and long-term resilience.

Agricultural insurance is crucial for small-scale rural entrepreneurs, including MSMEs, as it helps to mitigate the negative impacts of climate variability and extremes on their income and food security. It transfers risks to insurance companies or to the state, to face food losses and to facilitate access to financial instruments. Various types of agricultural insurance products exist, with public sector involvement crucial in Latin American countries. Innovative risk management tools focusing on small-scale producers are essential for reducing climate vulnerability and ensuring food security.

Final considerations

Transformative change will be needed to reduce hunger and food insecurity in Latin American and the Caribbean and to achieve SDG Targets 2.1 and 2.2 – ending hunger, food insecurity and malnutrition by 2030. The evolution and transformation of agrifood systems in the coming decades will have implications for health, socioeconomic well-being and the environment. Greater effort is required to ensure that the objectives of actions across and within sectors, such as the environment, food and nutrition, agriculture, health and social development, among others, are aligned to address the negative impacts and threats posed by climate variability and extremes. Accelerated action on resilience is critical to addressing immediate challenges and ensuring long-term progress towards food security and nutrition for all.

This report acknowledges the need for more research and evaluation to address the evidence gap on how policy mechanisms can effectively reduce the impacts of climate variability and extremes on food security and nutrition, particularly within agrifood systems. Region-specific data is crucial for developing effective policies and actions that support agrifood system actors, including vulnerable populations, to enhance climate resilience. As climate variability and extremes accelerate, current data collection efforts are falling behind, making it vital to improve data dynamism to inform more targeted and effective interventions. Without a robust data foundation, it will not be possible to design strategies that adequately address the challenges posed by climate variability and extremes.


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INTRODUCTION

The 2024 edition of the *Latin America and the Caribbean Regional Overview of Food Security and Nutrition* provides an update on the region's progress towards achieving the Sustainable Development Goals (SDGs), specifically Target 2.1 (ending hunger) and Target 2.2 (eradicating all forms of malnutrition) by 2030.

This year's report focuses on the impact of climate variability and extremes, such as drought, flooding and storms on food security and nutrition. As the second-most climate-exposed region globally, Latin America and the Caribbean faces significant challenges due to rising temperatures and more frequent and severe extreme weather events.

In addition, major drivers of food insecurity and malnutrition such as climate variability and extremes, conflicts, economic slowdowns and downturns, combined with well-established underlying factors, such as the lack of access to and unaffordability of healthy diets, unhealthy food environments and high and persistent inequality, have intensified. Addressing them will require the implementation of diverse portfolios of policies, investments and legislation to accelerate the transformation of agrifood systems and strengthen their resilience to the major drivers. It will require a comprehensive, intersectional, rights-based and systemic approach that considers people's livelihoods, promotes access to and affordability of healthy diets, and strengthens resilience in agrifood systems.

In this context, the report calls for transformative changes across agrifood systems, urging the integration of climate strategies, poverty alleviation efforts and inclusive economic development. Strengthening resilience is essential to prevent future setbacks in food security and nutrition, avoid worsening the nutritional situation in some countries and continue to move towards a more equitable, sustainable and food-secure future.

This report highlights the urgent need for accelerated action to build resilience to the major drivers within agrifood systems to safeguard the region's progress towards eliminating hunger, food insecurity and malnutrition while ensuring long-term sustainability.

PART 1 shows that Latin America and the Caribbean has experienced a decline in hunger and food insecurity for two consecutive years, a trend not seen in other parts of the world. This progress has been driven by robust social protection programmes, post-COVID-19 pandemic economic recovery efforts and targeted policies aimed at improving access to food. However, significant disparities persist across subregions and among women, rural populations and other populations in vulnerable situations. The region is not on track to meet most nutrition targets and, while the affordability of a healthy diet has improved, it still has the highest cost compared to other regions.

PART 2 presents recent evidence on the increasing exposure to climate variability and extremes in the region and how this driver affects the four dimensions of food security: availability, access, utilization and stability. Climate variability and extremes reduce agricultural productivity, disrupt food supply chains, raise food prices and affect food environments by making healthy diets less affordable, particularly for populations in vulnerable conditions, while also changing dietary habits. The evolving climate patterns are negatively impacting all dimensions of food security, as well as reinforcing other underlying causes of malnutrition.

Therefore, there is an urgent need to transform agrifood systems to be more efficient, inclusive, resilient, and sustainable. CHAPTER 7 of the second part calls for the adoption of a more comprehensive portfolio of policies, regulations and interventions that build resilience against disruptions to agrifood systems caused by climate variability and extremes, as one of the major drivers behind hunger and food insecurity trends. This section also presents actions and policy recommendations to address the underlying structural factors such as the lack of access to and unaffordability of healthy diets, unhealthy food environments, and high and persistent inequality that exacerbate the negative impacts of major drivers on food security and nutrition.

Climate variability and extremes pose important challenges for food security and nutrition now and in the future. Resilience is an outcome that agrifood systems should achieve for eradicating hunger and malnutrition in all its forms.

PART 1

FOOD SECURITY AND NUTRITION IN LATIN AMERICA AND THE CARIBBEAN

This chapter presents an update on food security and nutrition figures as of 2023, as well as an overview of the progress made towards the Sustainable Development Goals (SDGs) Target 2.1 to end hunger and ensure access by all people to safe, nutritious and sufficient food all year round, and SDG Target 2.2 end all forms of malnutrition (undernutrition, micronutrient deficiencies, overweight and obesity). The latest estimates show that in Latin America and the Caribbean these two indicators have been reduced for two consecutive years in a row. Despite these improvements, there are still significant differences among subregions persist and levels of hunger and malnutrition remain above those prior to the COVID-19 pandemic.

CHAPTER 1 Sustainable Development Goal Target 2.1: Undernourishment and food insecurity presents an update on the status of food security and progress towards achieving the targets related to hunger and food insecurity (SDG Target 2.1). It includes global, regional, subregional and national estimates of the two indicators of SDG Target 2.1: the prevalence of undernourishment and the prevalence of moderate or severe food insecurity based on the Food Insecurity Experience Scale.

CHAPTER 2 Sustainable Development Goal Target 2.2: Malnutrition presents an update on the status of nutrition and progress towards achieving the goals related to the eradication of malnutrition in all its forms (SDG Target 2.2). This includes global, regional, subregional and national estimates of the following indicators: stunting in children under 5 years of age, wasting in children under 5 years of age, overweight in children under 5 years of age, and anaemia among women aged 15 to 49 years.

CHAPTER 3 Additional World Health Assembly nutrition indicators assesses progress towards achieving three global nutrition targets approved by the World Health Assembly (WHA) related to adult obesity, exclusive breastfeeding and low birthweight.

CHAPTER 4 presents updated estimates of the cost and affordability of a healthy diet.

CHAPTER 1
SUSTAINABLE DEVELOPMENT GOAL TARGET 2.1: UNDERNOURISHMENT AND FOOD INSECURITY

Key messages

- Globally, the prevalence of undernourishment has remained stable over the past three years, currently affecting 9.1 percent of the population.
- In the region, hunger affected 6.2 percent of the population (41 million people) in 2023. This represents a 0.4 percentage point decrease (2.9 million people) compared to 2022 and a 0.7 percentage point decrease (4.3 million people) compared to 2021. However, this improvement is driven primarily by the decrease in South America.
- The prevalence of undernourishment decreased in South America from 2022 to 2023, while in Mesoamerica the prevalence remained practically unchanged, and finally, in the Caribbean hunger increased marginally.
- The global prevalence of moderate or severe food insecurity remains above pre-COVID-19 pandemic levels, showing little change over the past four years.
- Latin America and the Caribbean made considerable progress in reducing the prevalence of moderate or severe food insecurity, which decreased in 2023 fo the second consecutive year. The regional prevalence (28.2 percent) remains below the global estimate (28.9 percent) but slightly above pre-pandemic levels.
- At the subregional level, moderate or severe food insecurity decreased in all three subregions in 2023 compared to 2022. South America experienced the largest decrease (4.5 percentage points), followed by the Caribbean (1.7 percentage points) and Mesoamerica (0.4 percentage point).
- In 2023, 187.6 million people in the region experienced moderate or severe food insecurity, marking a decrease of 19.7 million people compared to 2022, and 37.3 million people compared to 2021. Breaking down the 2023 figure by subregion, 110.4 million people faced this situation in South America, while 51 million people were affected in Mesoamerica and 26.3 million people in the Caribbean.

- The reduction in the prevalence of undernourishment and moderate or severe food insecurity is attributed to the economic recovery of several countries in the region, marked by increasing employment levels, decreased poverty and extreme poverty, and benefits from energy price increases observed after the COVID-19 pandemic, particularly for energy-exporting countries. Furthermore, solid social protection systems allowed countries in the region to respond quickly to changes, which is especially important in times of financial restrictions.

- Severe food insecurity affected 8.7 percent of the population (58.1 million people) in the region in 2023. In the Caribbean, the prevalence was 28.6 percent (12.8 million people), followed by Mesoamerica with 7.6 percent (13.8 million people) and South America with 7.2 percent (31.6 million people).

- Despite regional progress, inequalities persist in food insecurity, with significant differences among subregions and population subgroups. The gender gap for moderate or severe food insecurity in Latin America and the Caribbean was 5.2 percentage points in 2023 compared to a 1.3 percentage point gap at the global level. Furthermore, this form of food insecurity was 6.2 percentage points higher in rural areas than in urban areas in the region.

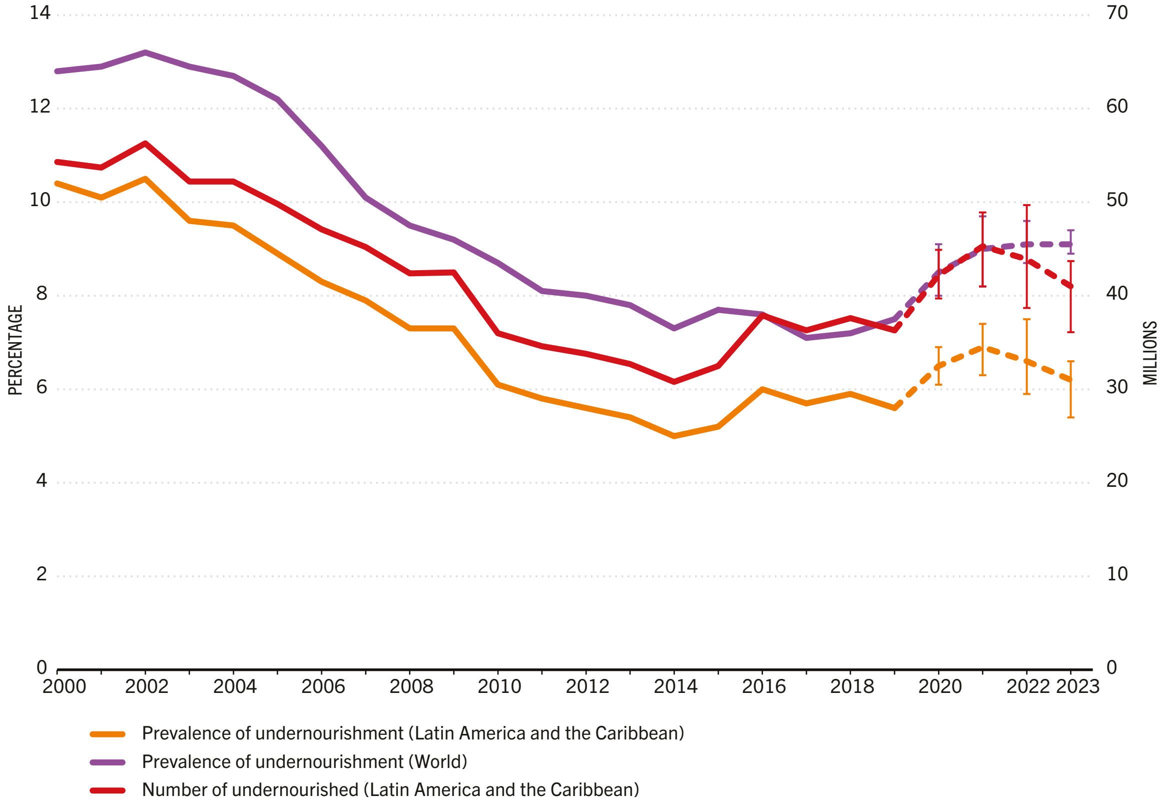
1.1 PREVALENCE OF UNDERNOURISHMENT

The Food and Agriculture Organization of the United Nations' (FAO) prevalence of undernourishment (PoU) indicator is derived from official country data on food supply, food consumption and dietary energy needs in the population considering demographic characteristics such as age, sex and levels of physical activity. Designed to capture a state of chronic energy deprivation, it does not reflect the short-lived effects of temporary crises or a temporarily inadequate intake of essential nutrients. FAO strives always to improve the accuracy of the PoU estimates by taking into account new information; the entire historical series is updated for each report. For this reason, only the current series of estimates should be used, including for values in past years.[1]

After significant increases between 2019 and 2021, hunger in the world, as measured by the PoU, has remained practically unchanged for three consecutive years (TABLE 1 and TABLE A-1). Latest estimates show that between 8.9 and 9.4 percent of the population faced hunger in 2023. This represents an estimate of between 713 and 757 million people who were undernourished. Taking the midpoint of these ranges, the prevalence of undernourishment was estimated to be 9.1 percent in 2023, or 733.4 million people, which shows an increase of about 152 million people since 2019.

In Latin America and the Caribbean, considerable progress toward reducing hunger has been made over the past two years. The prevalence of undernourishment for 2023 was estimated at 6.2 percent for the region (TABLE 1), which is significantly lower than the global estimate, and down from 6.9 percent in 2021 and 6.6 percent in 2022 but is still 0.6 percentage point above 2019 levels (FIGURE 1).

FIGURE 1
Prevalence of undernourishment in the world and Latin America and the Caribbean, and the number of undernourished in Latin America and the Caribbean

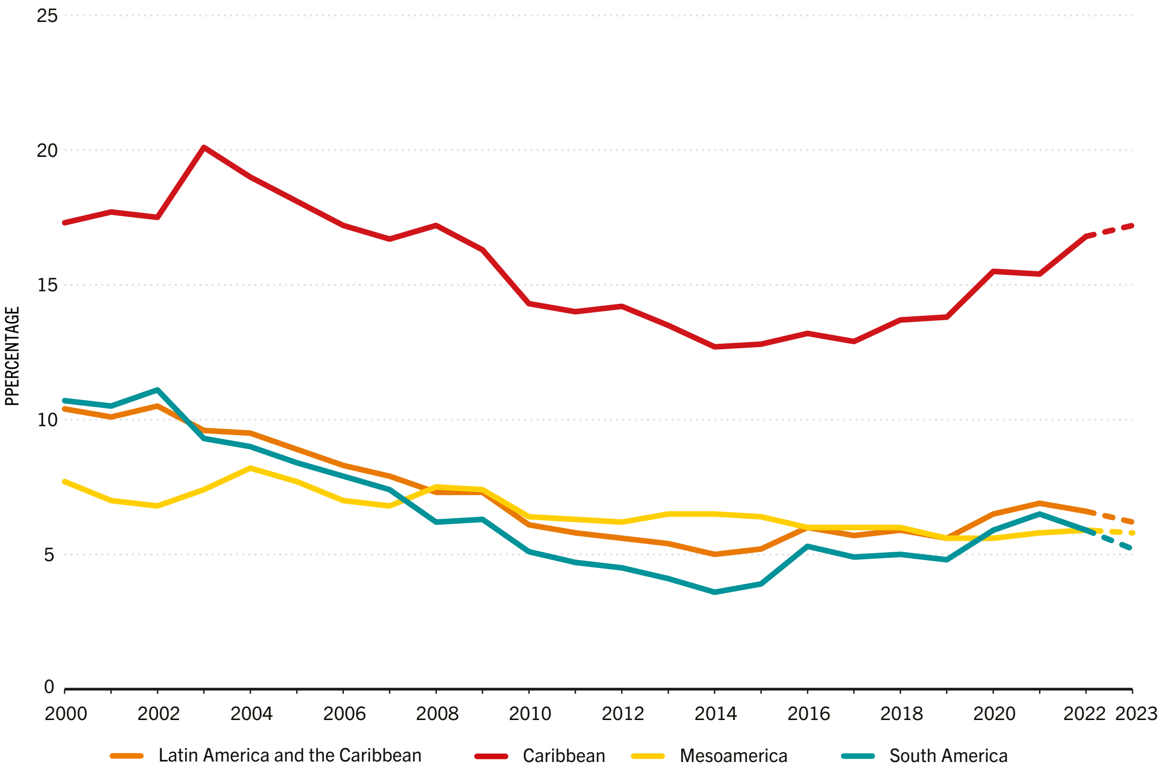


Note: The values for 2023 are projections based on nowcasts.
Source: FAO. 2024. FAOSTAT: Suite of Food Security Indicators. [Accessed on 24 July 2024]. https://www.fao.org/faostat/en/#data/FS. Licence: CC-BY-4.0.

The number of people affected by undernourishment was estimated to be 41 million people in 2023, which represents a reduction of 2.9 million people compared to 2022 and 4.3 million people compared to 2021, after a sharp increase of nearly 6 million people between 2019 and 2020.

Despite the progress made at the regional level, the figures mask considerable differences among subregions. The prevalence of undernourishment has been on the rise for the past two years in the Caribbean, while it has remained relatively unchanged in Mesoamerica and has decreased in South America (FIGURE 2). Latest estimates show that 17.2 percent of the population in the Caribbean was undernourished in 2023, which is a 0.4 percentage point increase compared to 2022. In Mesoamerica, the prevalence was estimated at 5.8 percent, which represents a marginal decrease of 0.1 percentage point compared to 2022. South America had the lowest prevalence of 5.2 percent, with a decrease of 0.7 percentage point compared to the previous year.

FIGURE 2
Prevalence of undernourishment in Latin America and the Caribbean by subregion



Note: The values for 2023 are projections based on nowcasts.
Source: 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.

TABLE 1
Prevalence of undernourishment (percent)

	2000	2010	2015	2019	2020	2022	2023
World	**12.8**	**8.7**	**7.7**	**7.5**	**8.5**	**9.1**	**9.1**
Latin America and the Caribbean	10.4	6.1	5.2	5.6	6.5	6.6	6.2
Caribbean	17.3	14.3	12.8	13.8	15.5	16.8	17.2
Mesoamerica	7.7	6.4	6.4	5.6	5.6	5.9	5.8
South America	10.7	5.1	3.9	4.8	5.9	5.9	5.2

Note: The values for 2023 are projections based on nowcasts.
Source: FAO. 2024. FAOSTAT: Suite of Food Security Indicators. [Accessed on 24 July 2024]. https://www.fao.org/faostat/en/#data/FS.
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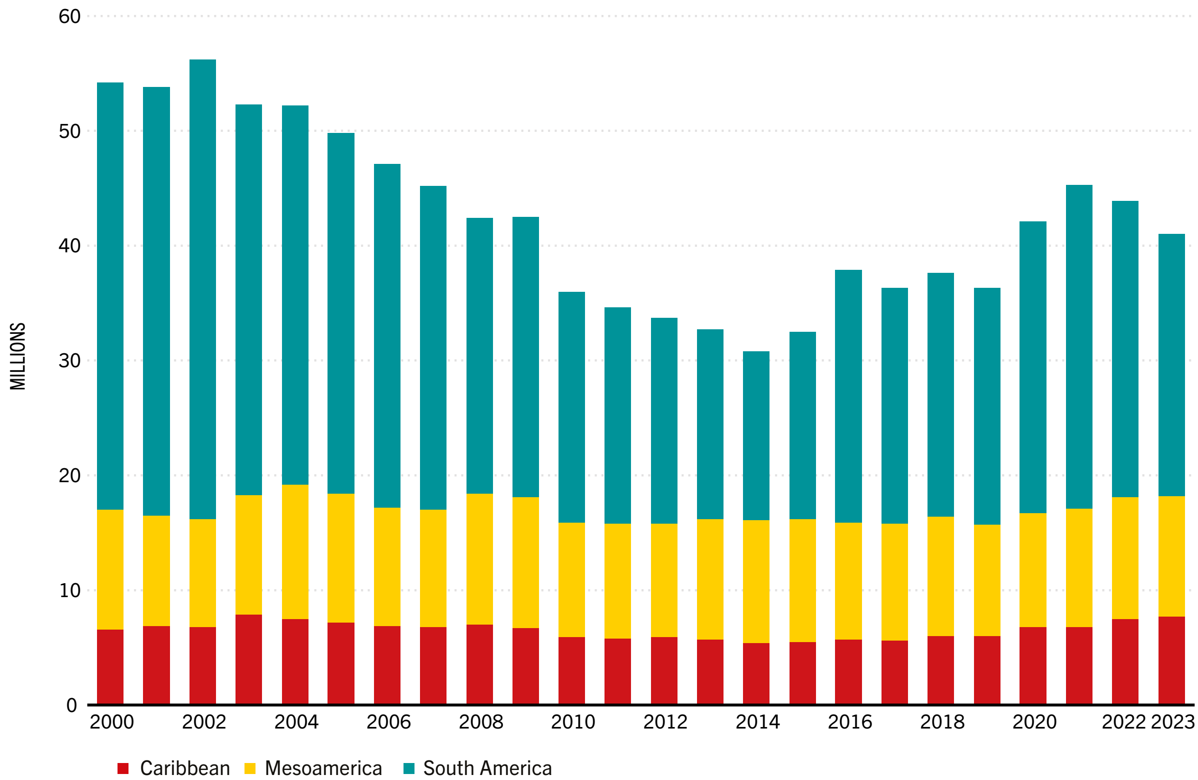
Of the 41 million people undernourished in 2023 in the region, 22.8 million live in South America (55.6 percent), 10.5 million in Mesoamerica (25.6 percent) and 7.7 million in the Caribbean (18.8 percent) (FIGURE 3). Comparing these latest estimates with those of 2022, the number of undernourished people increased in the Caribbean by 200 000, decreased in Mesoamerica by 100 000 and decreased in South America by 3 million.

Despite the decrease, estimates are still above pre-pandemic levels. In all three subregions an increase is observed in the number of undernourished people between 2019 and 2023. In the Caribbean, this number increased by 1.7 million, which is equivalent to a 28.3 percent increase. In Mesoamerica, 800 000 more people were undernourished, equivalent to an 8.2 percent increase. In South America, the number increased by 2.2 million people, or 10.7 percent.

FIGURE 3
Number of undernourished people in Latin America and the Caribbean by subregion



Note: The values for 2023 are projections based on nowcasts.
Source: 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.

TABLE 2
Number of people undernourished (millions)

	2000	2010	2015	2019	2020	2022	2023
World	**785.2**	**604.8**	**570.2**	**581.3**	**669.3**	**723.8**	**733.4**
Latin America and the Caribbean	54.3	36.0	32.5	36.3	42.2	43.9	41.0
Caribbean	6.6	5.9	5.5	6.0	6.8	7.5	7.7
Mesoamerica	10.4	10.0	10.7	9.7	9.9	10.6	10.5
South America	37.2	20.1	16.3	20.6	25.4	25.8	22.8

Note: The values for 2023 are projections based on nowcasts.
Source: 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.

Significant differences among countries are observed in the prevalence of undernourishment in Latin America and the Caribbean when comparing the three-year national averages (FIGURE 4). In the Caribbean, for the 2021–2023 period, Haiti showed a prevalence of 50.4 percent, followed by Dominica (13.4 percent) and Trinidad and Tobago (12.6 percent). In this same period Barbados, the Dominican Republic, and Saint Vincent and the Grenadines showed a prevalence below 5 percent (3.5, 4.6 and 4.8 percent, respectively); furthermore, Cuba had a prevalence below 2.5 percent.

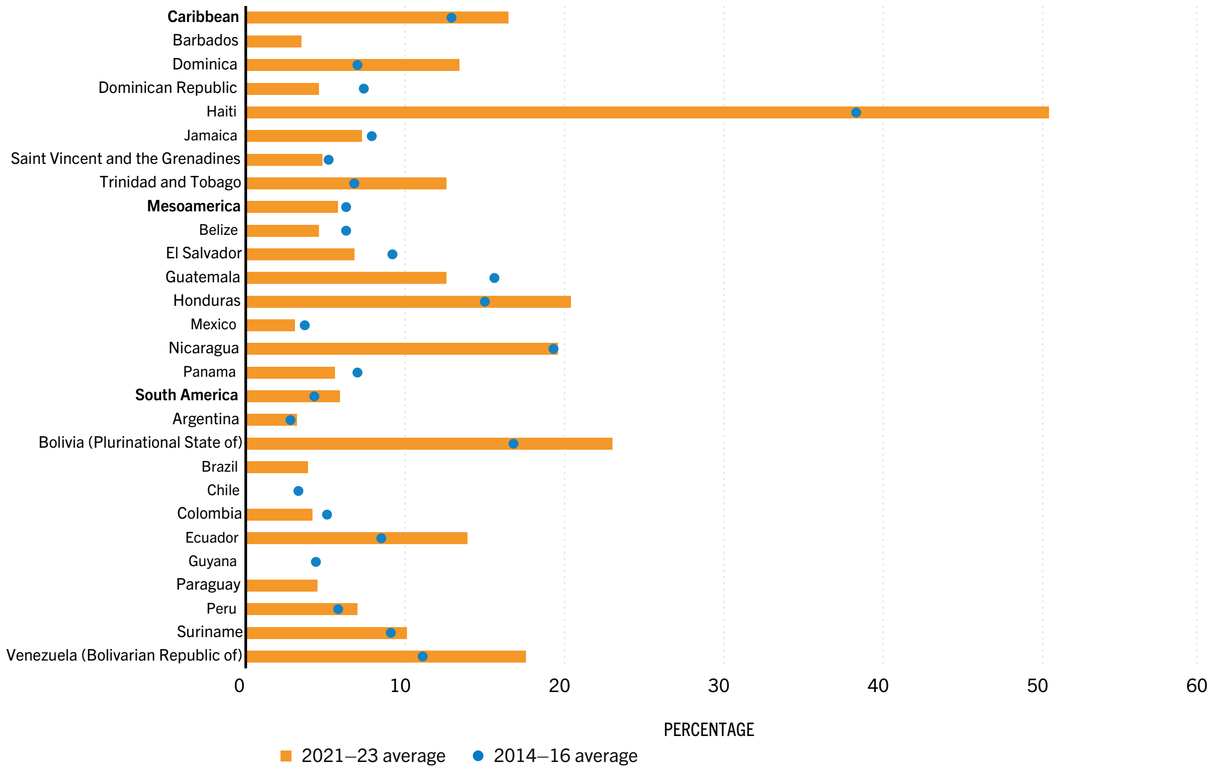
In Mesoamerica, Honduras showed a prevalence of undernourishment of 20.4 percent for the 2021–2023 period, followed by Nicaragua at 19.6 percent and Guatemala with 12.6 percent. At the other end of the spectrum, Costa Rica (less than 2.5 percent), Mexico (3.1 percent), Belize (4.6 percent) and Panama (5.6 percent) were the countries with the lowest prevalence in the subregion.

In South America, the prevalence of undernourishment in the Plurinational State of Bolivia was 23 percent, while 17.6 and 13.9 percent of the population of the Bolivarian Republic of Venezuela and Ecuador, respectively, was affected. However, in Chile, Uruguay and Guyana, the prevalence was estimated to be below 2.5 percent, followed by Argentina (3.2 percent), Brazil (3.9 percent) and Colombia (4.2 percent).

Comparing the latest estimates with previous figures corresponding to the 2014–2016 period, Haiti is the country that shows the highest increase, with an increase of 12.1 percentage points. In addition, the Bolivarian Republic of Venezuela and Dominica show an increase in the prevalence of undernourishment of 6.5 and 6.4 percentage points, respectively. Over the same period, the countries that show the largest decreases are Guatemala, the Dominican Republic and El Salvador (of 3.0, 2.8 and 2.4 percentage points, respectively).

Furthermore, when comparing these latest estimates with a more recent period (2019–2021) (see Annex I) the Bolivarian Republic of Venezuela shows the largest decrease compared to the 2021–2023 period, reducing the prevalence of undernourishment by 4.6 percentage points. The Dominican Republic, Saint Vincent and the Grenadines, and Guatemala also reduced this prevalence in the same period by 1.6, 1.3 and 1 percentage points, respectively. At the other end of the spectrum, the prevalence of undernourishment increased in Honduras, Haiti and the Plurinational State of Bolivia by 4.6, 5.3 and 6.1 percentage points, respectively.

FIGURE 4
Prevalence of undernourishment in Latin America and the Caribbean by country and subregion



Notes: The 2021–2023 average values reflect 2023 projections that are based on nowcasts. The prevalence of undernourishment was less than 2.5 percent for Barbados and Paraguay in 2014–2016, for Guyana and Chile in 2021–2023, and for Costa Rica, Cuba and Uruguay (not shown in figure) in both periods. Values are not available for Antigua and Barbuda, the Bahamas, Grenada, Saint Kitts and Nevis, and Saint Lucia.
Source: 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.

1.2 PREVALENCE OF FOOD INSECURITY BASED ON THE FOOD INSECURITY EXPERIENCE SCALE

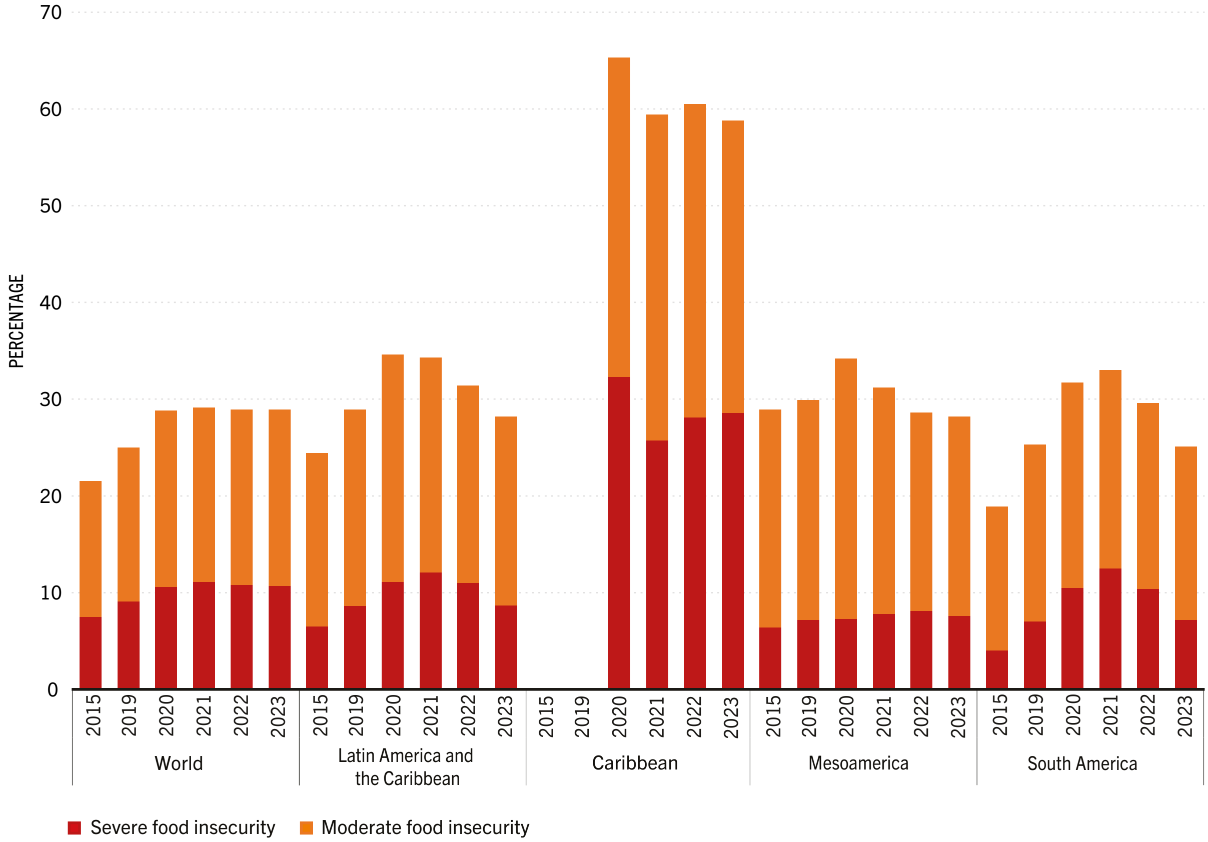
The prevalence of moderate or severe food insecurity based on the Food Insecurity Experience Scale (FIES) is an estimate of the proportion of the population facing moderate or severe constraints on their ability to obtain sufficient food over the course of a year. People face moderate food insecurity when they are uncertain of their ability to obtain food and have been forced to reduce, at times over the year, the quality and/or quantity of food they consume due to lack of money or other resources. Severe food insecurity means that individuals have likely run out of food, experienced hunger and, at the most extreme, have gone for days without eating, putting their health and well-being at serious risk.

In 2023, moderate or severe food insecurity affected 28.9 percent of the world population, while the prevalence of severe food insecurity was estimated at 10.7 percent (FIGURE 5). Following a significant increase between 2019 and 2020 in the context of the pandemic, levels have remained relatively unchanged in recent years. The total number of people affected by moderate or severe food insecurity was 2.33 billion, including 864.1 million facing severe food insecurity. While the prevalence of both indicators has remained relatively unchanged since 2020, the total number of people affected by both levels of food insecurity increased by 66 million and 36 million, respectively, due to population growth.

At the regional level, considerable progress has been made in Latin America and the Caribbean towards the reduction of food insecurity. After an increase between 2019 and 2020 following the pandemic, and stagnation between 2020 and 2021, the prevalence of moderate or severe food insecurity decreased for the second year in a row, affecting 28.2 percent of the population in 2023, which is equivalent to 187.6 million people. This also marks the first time in recent years that the regional estimate is below the world average (by 0.7 percentage point). Regarding severe food insecurity, the regional estimate of 8.7 percent was also below the world average (by 2 percentage points), which is equivalent to 58.1 million people.

Compared to 2022, the prevalence of moderate or severe food insecurity decreased by 3.2 percentage points, which is equivalent to 19.7 million fewer people affected. Severe food insecurity also decreased in this period by 2.3 percentage points, or 14.4 million fewer people than the previous year.

FIGURE 5
Prevalence of food insecurity in Latin America and the Caribbean by subregion



Note: See Annex III for details about years of data availability and population coverage for the Caribbean.
Source: 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.

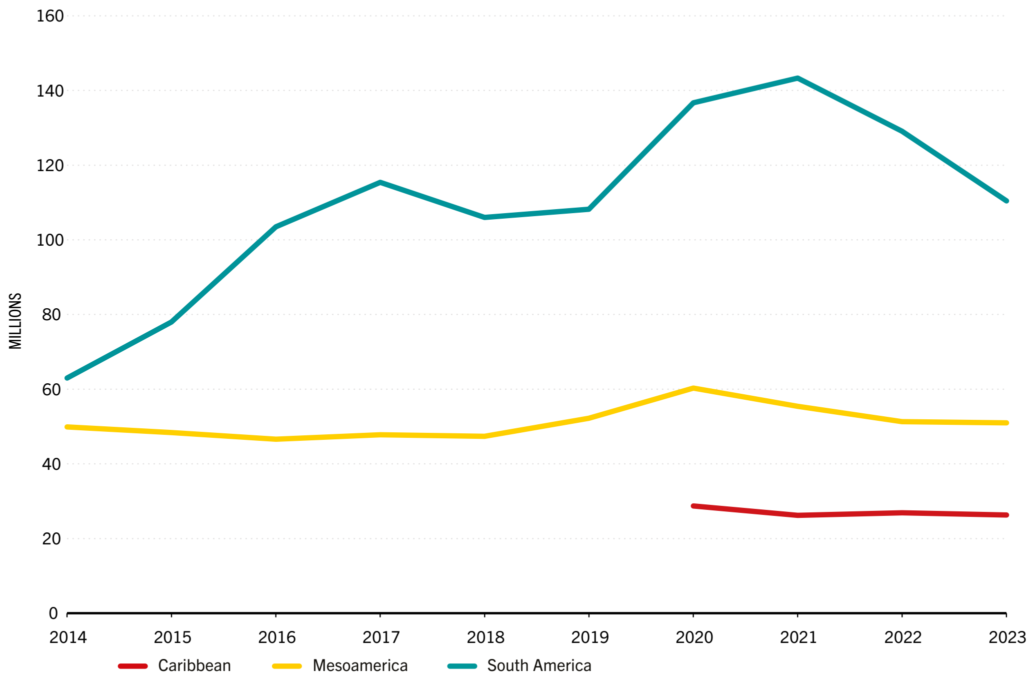
TABLE 3
Prevalence of food insecurity (percent)

	Severe food insecurity					Moderate or severe food insecurity				
	2015	**2019**	**2020**	**2022**	**2023**	**2015**	**2019**	**2020**	**2022**	**2023**
World	**7.5**	**9.1**	**10.6**	**10.8**	**10.7**	**21.5**	**25.0**	**28.8**	**28.9**	**28.9**
Latin America and the Caribbean	6.5	8.6	11.1	11.0	8.7	24.4	28.9	34.6	31.4	28.2
Caribbean	n.a.	n.a.	32.3	28.1	28.6	n.a.	n.a.	65.3	60.5	58.8
Mesoamerica	6.4	7.2	7.3	8.1	7.6	28.9	29.9	34.2	28.6	28.2
South America	4.0	7.0	10.5	10.4	7.2	18.9	25.3	31.7	29.6	25.1

Notes: n.a. = not available. See Annex III for details about years of data availability and population coverage for the Caribbean.
Source: 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.

Despite this considerable progress at the regional level, the improvement masks significant differences among the three subregions that constitute Latin America and the Caribbean. Both South America and Mesoamerica have a lower prevalence of moderate or severe food insecurity than the world average, estimated at 25.1 and 28.2 percent, respectively, which is equivalent to 110.4 million and 51 million people (TABLE 4). The Caribbean has a prevalence of 58.8 percent, equivalent to 26.3 million people. A positive element to highlight in the three subregions is that moderate or severe food insecurity decreased in 2023 compared to 2022. In South America, it decreased by 4.5 percentage points, while in the Caribbean it fell by 1.7 percentage points and in Mesoamerica by 0.4 percentage point.

FIGURE 6
Number of moderately or severely food-insecure people in Latin America and the Caribbean by subregion



Note: See Annex III for details about years of data availability and population coverage for the Caribbean.
Source: 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.

TABLE 4
Number of moderately or severely food insecure people (millions)

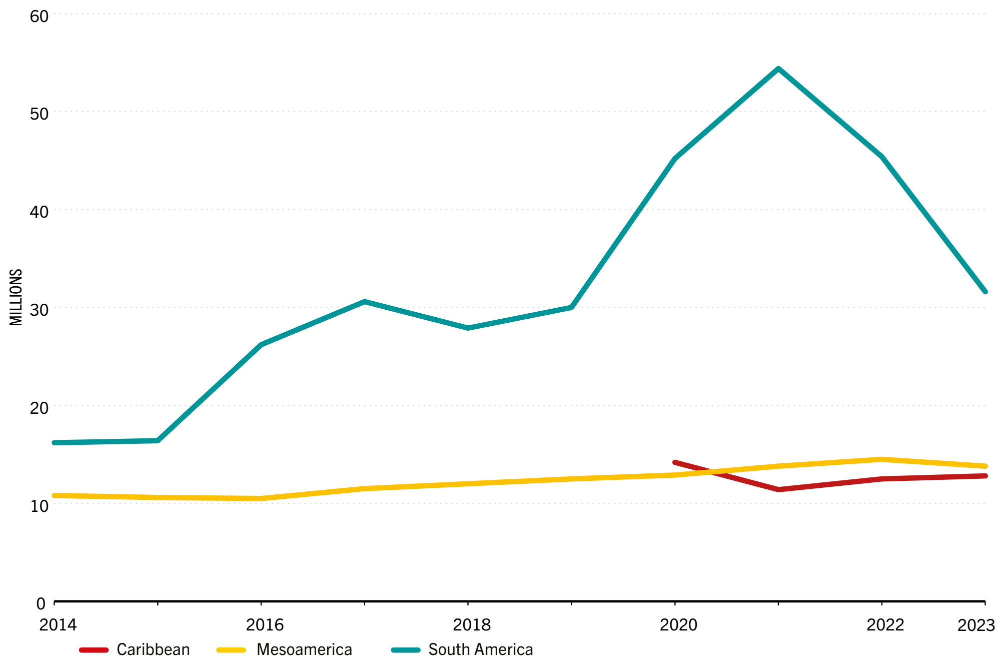
	2015	2017	2019	2020	2022	2023
World	**1 595.2**	**1 794.0**	**1 942.6**	**2 259.9**	**2 306.6**	**2 325.5**
Latin America and the Caribbean	152.2	189.8	186.7	225.7	207.3	187.6
Caribbean	n.a.	n.a.	n.a.	28.7	26.9	26.3
Mesoamerica	48.4	47.8	52.2	60.3	51.3	51.0
South America	78.0	115.4	108.2	136.7	129.1	110.4

Notes: n.a. = not available. See Annex III for details about years of data availability and population coverage for the Caribbean.
Source: 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.

Regarding severe food insecurity a similar situation is observed. South America and Mesoamerica have a lower prevalence than the global estimate at 7.2 and 7.6 percent, respectively, which is equivalent to 31.6 million and 13.8 million people affected. In the Caribbean, 28.6 percent of the population was severely food insecure, which is equivalent to 12.8 million people.

When comparing the latest estimates with 2022, in South America and Mesoamerica the prevalence of severe food insecurity decreased by 3.2 and 0.5 percentage points, respectively. The opposite is observed in the Caribbean, where the prevalence increased by 0.5 percentage point.

FIGURE 7
Number of severely food-insecure people in Latin America and the Caribbean by subregion



Note: See Annex III for details about years of data availability and population coverage for the Caribbean.
Source: 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.
Download: [Link TBD]

TABLE 5
Number of severely food insecure people (millions)

	2015	2017	2019	2020	2022	2023
World	**554.1**	**613.0**	**706.1**	**827.9**	**861.7**	**864.1**
Latin America and the Caribbean	40.4	55.5	55.7	72.2	72.5	58.1
Caribbean	n.a.	n.a.	n.a.	14.2	12.5	12.8
Mesoamerica	10.6	11.5	12.5	12.9	14.5	13.8
South America	16.4	30.6	30.0	45.2	45.4	31.6

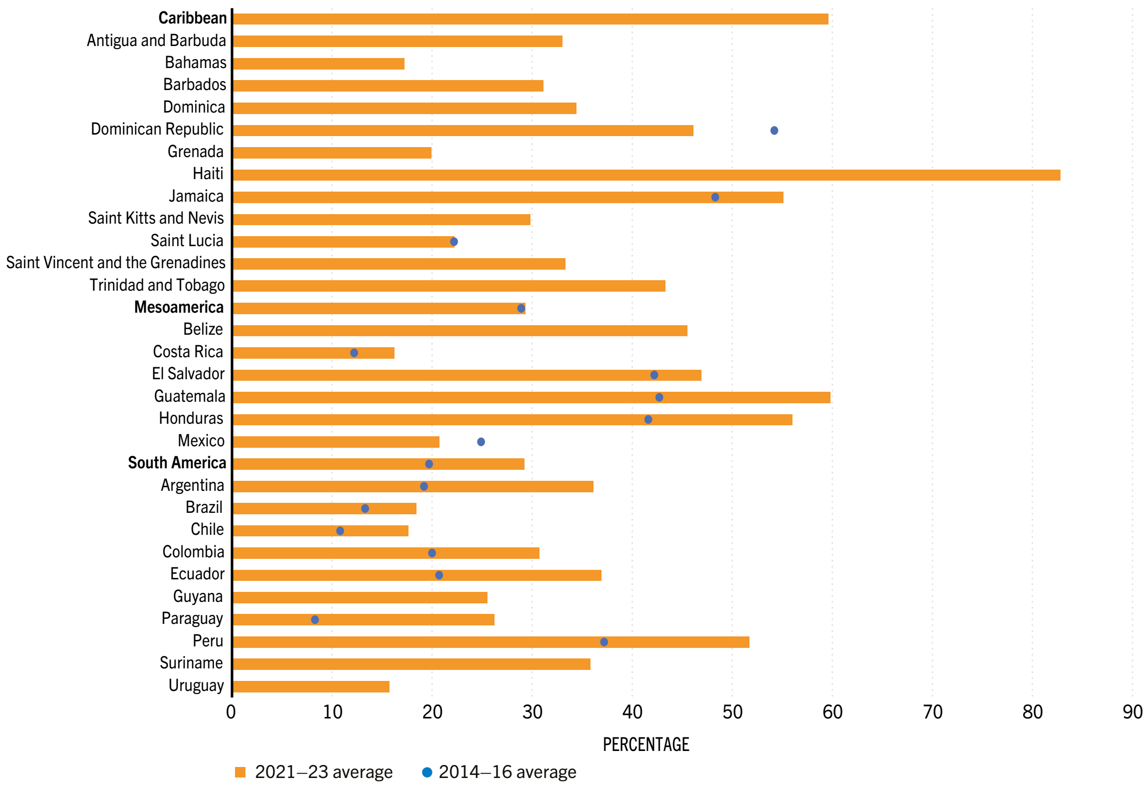
Notes: n.a. = not available. See Annex III for details about years of data availability and population coverage for the Caribbean.
Source: FAO. 2024. FAOSTAT: Suite of Food Security Indicators. [Accessed on 24 July 2024]. https://www.fao.org/faostat/en/#data/FS. Licence: CC-BY-4.0.

In the Caribbean in the 2021–2023 triennium, Haiti showed a prevalence of 82.8 percent, while in Jamaica and the Dominican Republic the prevalence was 55.1 and 46.1 percent, respectively. In Antigua and Barbuda, and Barbados, approximately one-third of the population was affected by this kind of food insecurity. In the subregion, the countries with the lowest prevalence of moderate or severe food insecurity were the Bahamas and Grenada, estimated at 17.2 and 19.9 percent, respectively.

In Mesoamerica, more than half the population of Guatemala and Honduras was affected by moderate or severe food insecurity in the 2021–2023 triennium. In Belize and El Salvador, upward of 40 percent of the population was affected by food insecurity, while Mexico and Costa Rica were the countries with the lowest proportion of people affected, estimated at 20.7 and 16.2 percent, respectively.

In South America, more than half the population of Peru was moderately or severely food insecure. Furthermore, in Argentina, Ecuador and Suriname, 36.1, 36.9 and 35.8 percent, respectively, of the population was affected by moderate or severe food insecurity. At the other end of the spectrum, Uruguay, Chile and Brazil had the lowest prevalence at 15.7, 17.6 and 18.4 percent, respectively.

FIGURE 8
Prevalence of moderate or severe food insecurity in Latin America and the Caribbean by country and subregion



Note: See Annex III for details about years of data availability and population coverage for the Caribbean.
Source: 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.

Comparing the 2021–2023 triennium with the 2014–2016 triennium, Paraguay, Guatemala and Argentina showed increases in the prevalence of moderate or severe food insecurity of 17.9, 17.1 and 16.9 percentage points, respectively. In the Dominican Republic and Mexico, the prevalence of moderate or severe food insecurity decreased in these periods by 8.1 and 4.2 percentage points, respectively.

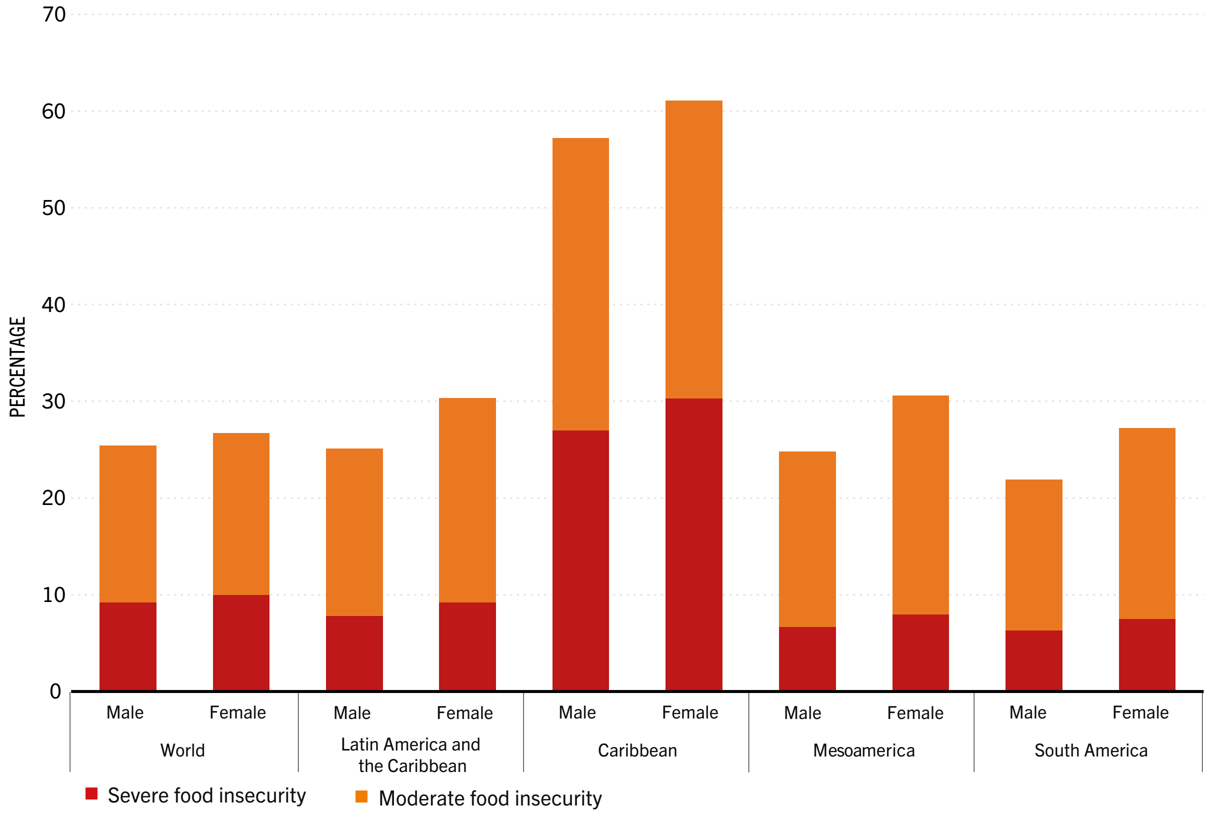
Compared with a more recent period (2019–2021) (see Annex I), the countries that were able to reduce the prevalence of moderate or severe food insecurity the most were the Dominican Republic (7 percentage points) and Mexico (4.8 percentage points). The countries with the highest increase in this same period were Honduras and Jamaica, with increases of 6.1 and 4.8 percentage points, respectively.

Food insecurity in both degrees of severity continues to impact different subgroups of the population disproportionately (FIGURE 9). The prevalence of food insecurity among women is higher than the prevalence among men. This is observed both at the global level and across all regions of the world. At the global level, the prevalence of moderate or severe food insecurity was 1.3 percentage points higher among women in 2023, and for severe food insecurity it was 0.8 percentage points higher. It is worth noting that the gender gap for moderate or severe food insecurity decreased by 1 percentage point compared to 2022, and for severe food insecurity the gap remained virtually unchanged.

In Latin America and the Caribbean, the gender gap in food insecurity was larger compared to that of the world at both levels of severity (TABLE 6). For moderate or severe food insecurity in 2023, the gender gap in the region was 5.2 percentage points, while for severe food insecurity it was 1.4 percentage points, which is closer to the global estimate.

Considering the gender gaps in the subregions, Mesoamerica had the largest difference of 5.8 percentage points for moderate or severe food insecurity, and 1.3 percentage points for severe food insecurity. In South America, the gender gap for the former was 5.3 percentage points, while the gap for the latter was 1.2 percentage points. For the Caribbean, the gender gap on moderate or severe food insecurity was 3.9 percentage points, while for severe food insecurity, the gap was estimated at 3.3 percentage points, higher than the other two subregions.

FIGURE 9
Prevalence of moderate or severe food insecurity by sex, 2023



Source: 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.

TABLE 6
Number of severely food insecure people (millions)

	Severe food insecurity						Moderate or severe food insecurity					
	Men			Women			Men			Women		
	2019	2020	2023	2019	2020	2023	2019	2020	2023	2019	2020	2023
World	**7.8**	**8.9**	**9.2**	**8.4**	**10.0**	**10.0**	**21.9**	**24.9**	**25.4**	**23.3**	**27.3**	**26.7**
Latin America and the Caribbean	7.7	10.0	7.8	9.1	11.8	9.2	25.7	30.2	25.1	31.0	38.1	30.3
Caribbean	n.a.	31.4	27.0	n.a.	33.5	30.3	n.a.	63.6	57.2	n.a.	68.0	61.1
Mesoamerica	6.5	6.1	6.7	7.4	8.1	8.0	26.3	28.0	24.8	32.8	39.5	30.6
South America	6.0	9.4	6.3	7.4	11.0	7.5	22.3	27.7	21.9	27.1	34.7	27.2

Source: 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.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CHAPTER 2
SUSTAINABLE DEVELOPMENT GOAL TARGET 2.2: MALNUTRITION

Key messages

- In Latin America and the Caribbean, the prevalence of stunting in children under 5 years of age has shown significant progress since 2000. Despite this progress, the rate of decline has been slowed down in recent years. In 2022, the prevalence of stunting in the region was 11.5 percent, which is significantly below the global estimate of 22.3 percent. However, while the prevalence decreased by nearly 5 percentage points between 2000 and 2012, the reduction between 2012 and 2022 was only 1.2 percentage points.
- Stunting in children was estimated at 16.9 percent in Mesoamerica, followed by 11.3 percent in the Caribbean and 9.0 percent in South America in 2022.
- In 2022, the prevalence of wasting among children under 5 years of age in Latin America and the Caribbean was 1.4 percent, significantly below the global estimate of 6.8 percent. Most countries in the region are on track to achieve the SDG target, which aims to maintain wasting levels below 3 percent.
- Wasting in children was estimated at 2.9 percent in the Caribbean, followed by 1.4 percent in South America and 1.0 percent in Mesoamerica in 2022.
- The prevalence of overweight in children under 5 years of age in Latin America and the Caribbean increased steadily between 2000 and 2022, reaching 8.6 percent. The regional prevalence, as well as the prevalence in all subregions, is above the global estimate of 5.6 percent. The increase in the prevalence of overweight in the region has been larger than the global average.
- In 2022, overweight in children was estimated at 9.7 percent in South America, followed by 6.7 percent in Mesoamerica and 6.6 percent in the Caribbean.
- In Latin America and the Caribbean, anaemia affected 17.2 percent of women aged 15 to 49 years in 2019, significantly below the global estimate of 29.9 percent. This regional estimate masks significant differences among the subregions. In the Caribbean, 29.2 percent of women in this age group suffered from anaemia, compared to 17.3 percent in South America and 14.6 percent in Mesoamerica.

This section reports on four global nutrition indicators: stunting, wasting and overweight in children under 5 years of age, and anaemia in women aged 15 to 49 years.

2.1 STUNTING AMONG CHILDREN UNDER 5 YEARS OF AGE

Stunting in children under 5 years of age refers to a height-for-age more than two standard deviations below the median of the World Health Organization (WHO) Child Growth Standards. Low height-for-age is an indicator that reflects the cumulative effects of undernutrition and infections since and even before birth. It reflects growth faltering as a result of long-term nutritional deprivation interacting with a variety of other factors over a sustained period of time, such as recurrent infections, diseases that cause poor nutrient intake, absorption or utilization, lack of water and sanitation infrastructure and poverty. Stunted children are at greater risk for illness and death. Stunting often adversely affects the cognitive and physical growth of children, making for poor performance in school and reduced intellectual capacity.[2]

Stunting affected 22.3 percent of children under 5 years of age in the world in 2022. In Latin America and the Caribbean, the prevalence was estimated at 11.5 percent, which is about half the global estimate. Although significant reductions have been observed in the region since the beginning of this millennium, the decline has been slowing down in recent years. Between 2000 and 2012, the prevalence of stunting decreased by 5.1 percentage points in Latin America and the Caribbean, compared to a reduction of only 1.2 percentage points in the period 2012–2022.

There are important differences across subregions (TABLE 7). In South America, the prevalence of stunting in children under 5 years of age in 2022 was 9.0 percent, showing a reduction of 1.1 percentage points compared to 2012. In Mesoamerica, the prevalence was 16.9 percent, representing a decrease of 1.3 percentage points in the same period. In the Caribbean, the prevalence was 11.3 percent, while between 2012 and 2022 the decrease was 1.7 percentage points.

TABLE 7
Prevalence of stunting among children under 5 years of age (percent)

	2000	2005	2010	2012	2015	2020	2022
World	**33.0**	**31.1**	**27.9**	**26.3**	**24.6**	**22.7**	**22.3**
Latin America and the Caribbean	17.8	15.7	13.6	12.7	12.1	11.7	11.5
Caribbean	15.3	14.6	13.7	13.0	12.5	11.7	11.3
Mesoamerica	25.3	22.3	19.3	18.2	17.5	17.2	16.9
South America	14.6	12.7	10.9	10.1	9.5	9.1	9.0

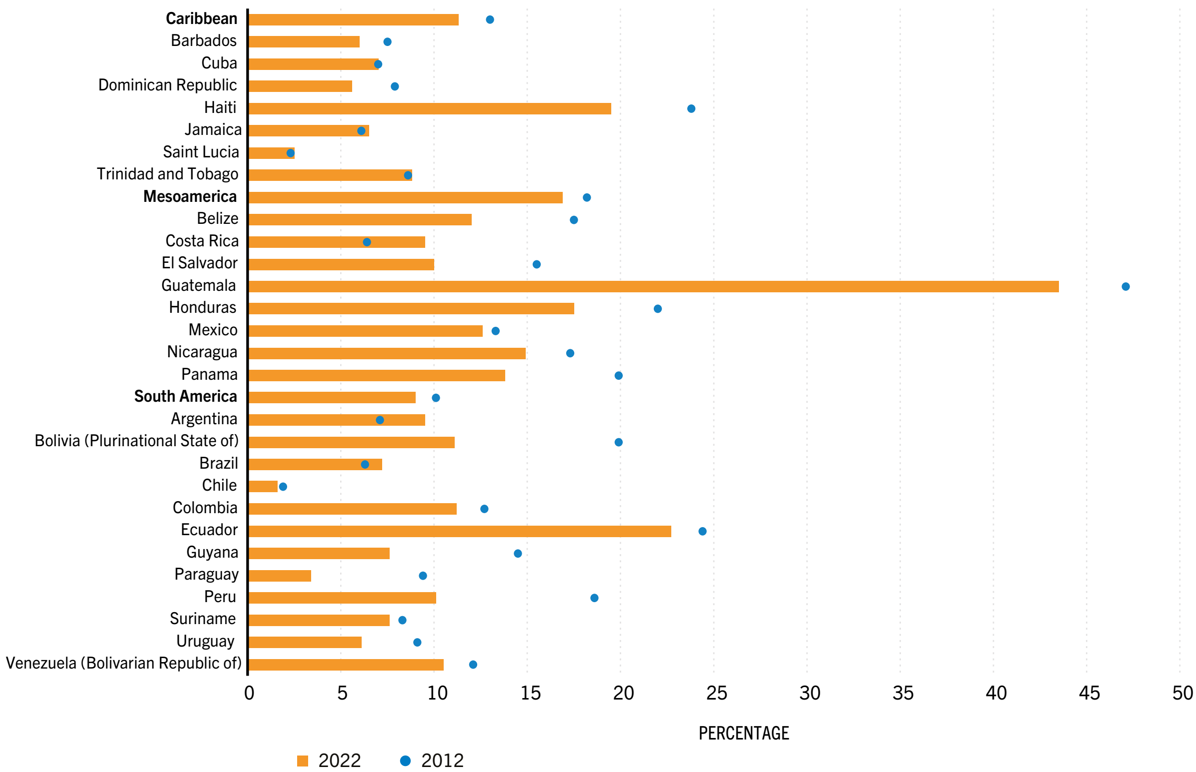
Source: UNICEF, WHO & World Bank. 2023. Levels and trends in child malnutrition. UNICEF / WHO / World Bank Group Joint Child Malnutrition Estimates – Key findings of the 2023 edition. New York, USA, UNICEF; Geneva, Switzerland, WHO; and Washington, DC, World Bank. https://data.unicef.org/resources/jme-report-2023

Despite this progress in the past 20 years, the data presented above at the regional and subregional level shows that the region is not on track to achieve the global 2030 target for childhood stunting, which aims at a 40 percent reduction in the number of children from the 2012 baseline (FIGURE 10). If we compare a 10-year period between 2012 and 2022, most of the countries in the region were able to decrease this prevalence. The countries with the largest reduction were the Plurinational State of Bolivia, Peru, Guyana and Panama, with reductions of 8.8, 8.5, 6.9 and 6.1 percentage points, respectively. However, in Costa Rica, Argentina and Brazil over the same period the prevalence increased by 3.1, 2.4 and 0.9 percentage points, respectively.

Considering absolute values, Chile, Saint Lucia and Paraguay had the lowest prevalence of stunting in the region in 2022 (1.6, 2.5 and 3.4 percent, respectively).

FIGURE 10

Prevalence of stunting among children under 5 years of age in Latin America and the Caribbean by country and subregion



Source: 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

2.2 WASTING AMONG CHILDREN UNDER 5 YEARS OF AGE

Wasting is defined as weight-for-height more than two standard deviations below the median of the WHO Child Growth Standards. Low weight-for-height is an indicator of acute weight loss or a failure to gain weight and can be the result of insufficient food intake and/or frequent or prolonged illnesses. Wasting indicates acute malnutrition and increases the risk of death in childhood from infectious diseases, such as diarrhoea, pneumonia and measles.[3,4]

Data corresponding to 2022 shows that the prevalence of wasting in Latin America and the Caribbean was 1.4 percent, which is significantly lower than the global estimate of 6.8 percent (TABLE 8). Looking at the three subregions, the Caribbean had a prevalence of 2.9 percent, which is slightly above the regional estimate, followed by South America at 1.4 percent, and finally Mesoamerica at 1.0 percent.

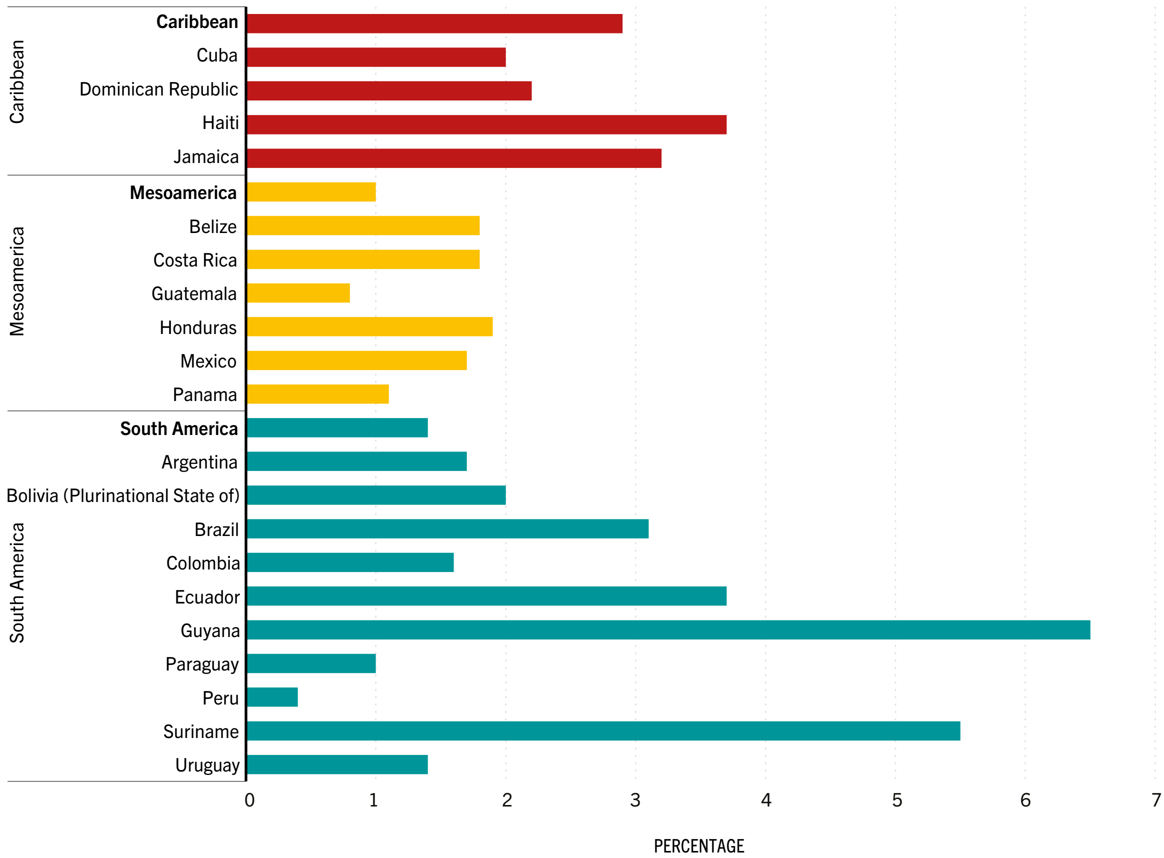
FIGURE 11 shows the prevalence of wasting for a series of countries in the region considering data for the latest year available. Even though all three subregions, and most countries, are on track to reach the 2030 global target for this indicator, which is to reduce and maintain wasting among children under 5 years of age below 3 percent, six countries in the region still present a prevalence higher than this target. These countries are Guyana, which has a prevalence of 6.9 percent, followed by Suriname at 5.5 percent, Haiti and Ecuador, both at 3.7 percent, while Jamaica and Brazil show a prevalence of 3.2 and 3.1 percent, respectively.

TABLE 8
Prevalence of wasting among children under 5 years of age (percent)

	2022
World	**6.8**
Latin America and the Caribbean	1.4
Caribbean	2.9
Mesoamerica	1.0
South America	1.4

Source: 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

FIGURE 11
Prevalence of wasting among children under 5 years of age in Latin America and the Caribbean by country and subregion (latest year available from 2015 to 2022)



Source: 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

2.3 OVERWEIGHT AMONG CHILDREN UNDER 5 YEARS OF AGE

Overweight among children under 5 years of age is defined as weight-for-height higher than two standard deviations over the median of the WHO Child Growth Standards median. This indicator reflects an accumulation of fat and is often a manifestation of expending less energy than has been consumed. Childhood overweight and obesity is associated with a higher probability of overweight and obesity in adulthood, which can lead to various non-communicable diseases (NCDs), such as diabetes and cardiovascular diseases, and various types of cancer.[5]

In 2022, overweight affected 5.6 percent of children under 5 years of age at a global level. In Latin America and the Caribbean this prevalence was estimated at 8.6 percent, or 3.0 percentage points above the global estimate (TABLE 9). Furthermore, the regional estimate of childhood overweight has shown a faster increase in comparison to the global estimate. Between 2012 and 2022, the increase in the region was 1.2 percentage points, compared to 0.1 percentage point increase in the global estimate.

The trend observed across subregions varies considerably in Latin America and the Caribbean. The increase in the regional estimate is driven mainly by the increase in South America, compared to a much more stable trend in recent years in both Mesoamerica and the Caribbean.

In comparing the evolution of the prevalence of overweight among children under 5 years of age in Latin America and the Caribbean between 2012 and 2022

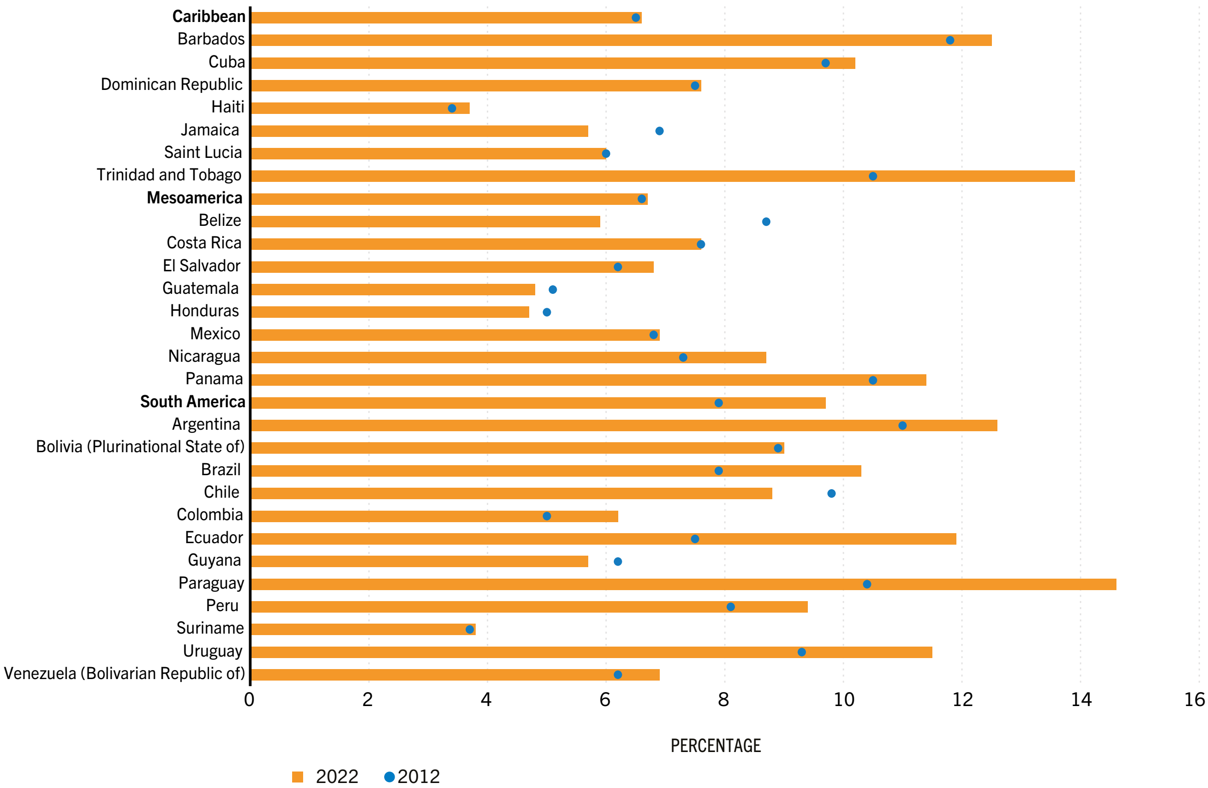
TABLE 9
Prevalence of overweight among children under 5 years of age (percent)

	2000	2005	2010	2012	2015	2020	2022
World	**5.3**	**5.6**	**5.5**	**5.5**	**5.5**	**5.6**	**5.6**
Latin America and the Caribbean	6.8	7.1	7.3	7.4	7.7	8.3	8.6
Caribbean	6.1	6.4	6.4	6.5	6.5	6.6	6.6
Mesoamerica	6.9	6.7	6.6	6.6	6.5	6.5	6.7
South America	6.9	7.4	7.7	7.9	8.3	9.3	9.7

Source: 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

(FIGURE 12), most countries of the region showed an increase, with Ecuador, Paraguay, and Trinidad and Tobago being the ones with the largest increases, estimated at 4.4, 4.2 and 3.4 percentage points, respectively. However, three countries were able to reduce the prevalence during the same period. In Belize, Jamaica and Chile the prevalence of overweight among children decreased by 2.8, 1.2 and 1 percentage point, respectively. In both Costa Rica and Saint Lucia, the prevalence remained at the same level in 2012 and 2022.

FIGURE 12
Prevalence of overweight among children under 5 years of age in Latin America and the Caribbean by country and subregion



Source: 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

2.4 ANAEMIA AMONG WOMEN AGED 15 TO 49 YEARS

Anaemia affected 17.2 percent of women aged 15 to 49 years in the region in 2019, which is equivalent to 29.6 million women in this age group. The regional prevalence is significantly below the world average of 29.9 percent. In the three subregions, the prevalence of anaemia among women in South America and Mesoamerica was 17.3 and 14.6 percent, respectively. The Caribbean, however, has a prevalence (29.2 percent) that is very close to the global estimate, and much higher than the other two subregions (TABLE 10).

Looking at the trend of this indicator since 2000, the prevalence of anaemia has decreased in all subregions, but this progress has come to a halt from 2014 onwards in the region.

TABLE 10
Prevalence of anaemia among women aged 15 to 49 years (percent)

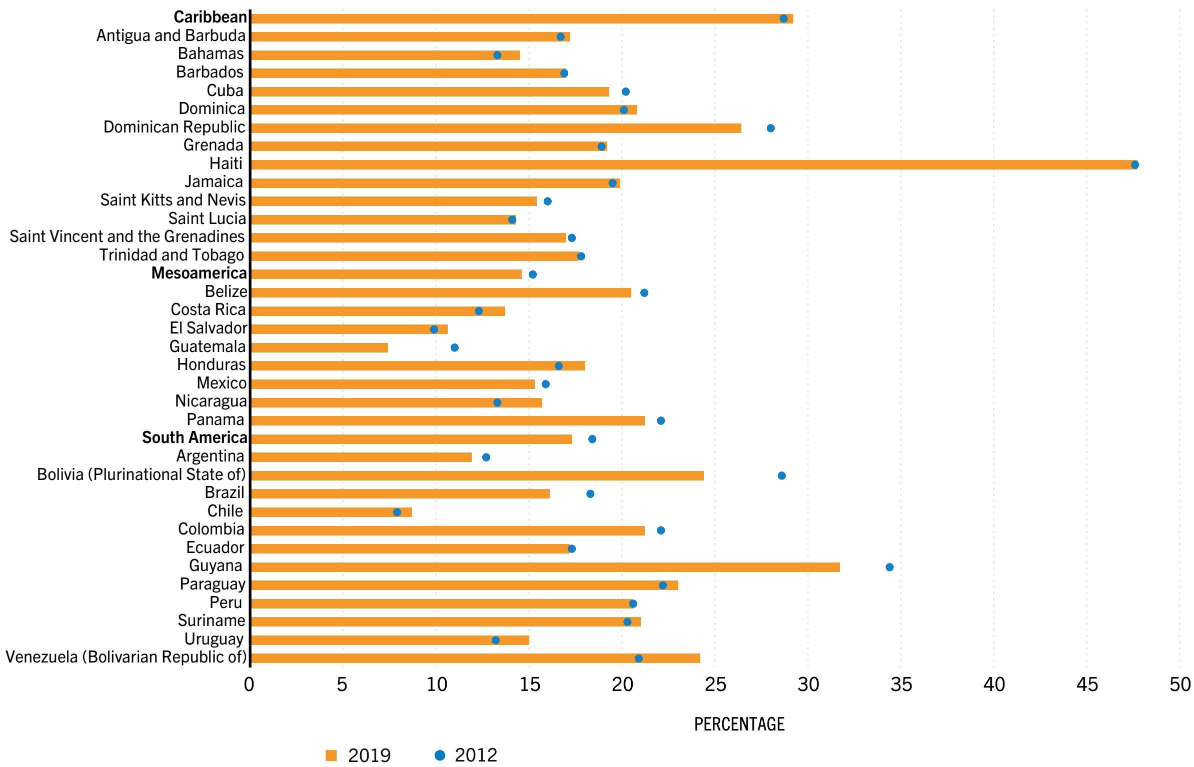
	2000	2005	2010	2012	2015	2019
World	**31.2**	**29.9**	**28.6**	**28.5**	**28.8**	**29.9**
Latin America and the Caribbean	25.6	22.8	19.3	18.2	17.3	17.2
Caribbean	34.8	32.0	29.2	28.7	28.6	29.2
Mesoamerica	22.5	19.0	16.1	15.2	14.5	14.6
South America	25.9	23.4	19.6	18.4	17.4	17.3

Notes: The estimates refer to women aged 15 to 49 years, including pregnant, non-pregnant and lactating women, and were adjusted for altitude and smoking. WHO defines anaemia in pregnant women as a haemoglobin concentration <110 g/L at sea level, and anaemia in non-pregnant women and lactating women as a haemoglobin concentration <120 g/L.
Source: WHO. 2021. WHO global anaemia estimates, 2021 edition. In: WHO. [Cited 24 July 2024].
www.who.int/data/gho/data/themes/topics/anaemia_in_women_and_children

The countries with the highest prevalence of anaemia among women aged 15 to 49 years in the region in 2019 (FIGURE 13) were Haiti, Guyana and the Dominican Republic, with prevalences of 47.7, 31.7 and 26.4 percent, respectively. At the other end of the spectrum, El Salvador (10.6 percent), Chile (8.7 percent) and Guatemala (7.4 percent) had the lowest prevalence. Since 2012, 15 countries in the region have been able to reduce the prevalence of anaemia among women. The countries with the largest reductions were the Plurinational State of Bolivia (4.2 percentage points), Guatemala (3.6 percentage points), Guyana (2.7 percentage points) and Brazil (2.2 percentage points). The countries with the largest increases for this same period were the Bolivarian Republic of Venezuela (3.3 percentage points), Nicaragua (2.4 percentage points) and Uruguay (1.8 percentage points).

FIGURE 13

Prevalence of anaemia among women aged 15 to 49 years in Latin America and the Caribbean by country and subregion



Notes: The estimates refer to women aged 15 to 49 years, including pregnant, non-pregnant and lactating women, and were adjusted for altitude and smoking. WHO defines anaemia in pregnant women as a haemoglobin concentration < 110 g/L at sea level, and anaemia in non-pregnant women and lactating women as a haemoglobin concentration < 120 g/L.
Source: WHO. 2021. WHO global anaemia estimates, 2021 edition. In: WHO. [Cited 24 July 2024]. www.who.int/data/gho/data/themes/topics/anaemia_in_women_and_children

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CHAPTER 3
ADDITIONAL WORLD HEALTH ASSEMBLY NUTRITION INDICATORS

Key messages

- New global estimates of the prevalence of obesity among adults have shown a steady increase since 2000, from 8.7 percent in 2000 to 15.8 percent in 2022, with a total of 881 million people affected.
- In Latin America and the Caribbean, the prevalence of obesity among adults is almost double the global estimate with 29.9 percent of the population affected in 2022, up from 15.4 percent in 2000. The Caribbean had the lowest prevalence at 24.5 percent, followed by South America at 28.6 percent, and Mesoamerica at 34.4 percent.
- Considerable progress has been made since 2012 towards increasing the prevalence of exclusive breastfeeding for infants under 6 months of age in the region. The latest estimates, corresponding to 2022, show that 43.1 percent of infants under 6 months in the region were exclusively breastfed, up from 34.3 percent in 2012.
- South America had the highest prevalence of exclusive breastfeeding at 47.1 percent, followed by Mesoamerica (38.7 percent) and the Caribbean (31.4 percent).
- Latin America and the Caribbean has a lower prevalence of low birthweight than the global estimate. In 2020, this prevalence was 9.6 percent compared to the global estimate of 14.7 percent. The Caribbean showed a prevalence of 11.7 percent, followed by Mesoamerica (10.9 percent) and finally South America (8.8 percent).

This section assesses progress towards three additional WHA endorsed global nutrition targets, i.e. exclusive breastfeeding, low birthweight and adult obesity.

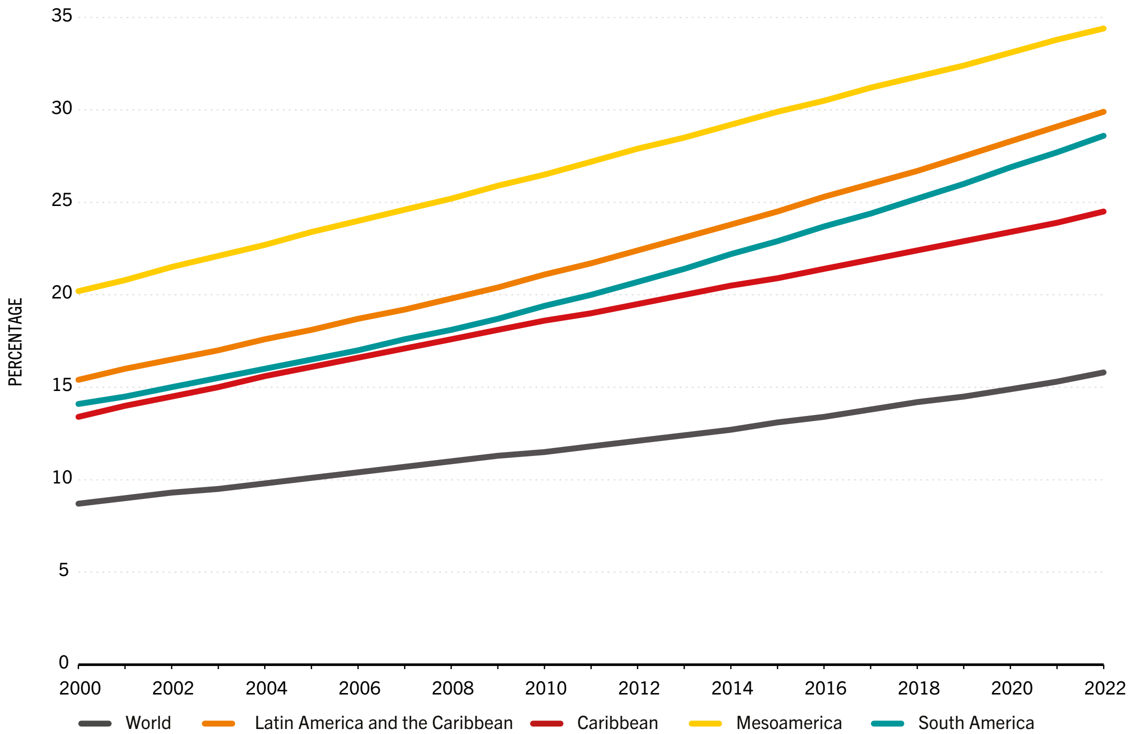
3.1 ADULT OBESITY

Obesity among adults is measured by taking the body mass index (BMI), which is the ratio of weight-to-height commonly used to classify the physical status of adults. It is calculated as the body weight in kilograms divided by the square of the body height in metres (kg/m2). Obesity includes individuals with a BMI equal to or higher than 30 kg/m^2.

New data available on the prevalence of obesity among adults shows that there has been a steady increase over the last 20 years, with the global prevalence up from 8.7 percent in 2000 to 15.8 percent in 2022, which is equivalent to 881 million people (FIGURE 14).

In Latin America and the Caribbean, the prevalence is almost double the global estimate, with 29.9 percent of the adult population in the region affected by obesity in 2022, which is equivalent to 141.4 million people. In addition, the prevalence has shown an increase of 7.5 percentage points in the last 10 years, equivalent to 50 million more people. At the subregional level, Mesoamerica had the highest prevalence in 2022, at 34.4 percent, followed by South America (28.6 percent) and the Caribbean (24.5 percent). An increase in the prevalence of obesity has been observed in all subregions since 2000 (TABLE 11).

FIGURE 14
Prevalence of obesity among adults in Latin America and the Caribbean by subregion



Source: WHO. 2024. Global Health Observatory (GHO) data repository: Prevalence of obesity among adults, BMI ≥ 30, age-standardized. Estimates by country. [Accessed on 24 July 2024]. https://apps.who.int/gho/data/node.main.A900A?lang=en. Licence: CC-BY-4.0.

TABLE 11
Prevalence of obesity among adults (percent)

	2000	2005	2010	2012	2015	2020	2022
World	**8.7**	**10.1**	**11.5**	**12.1**	**13.1**	**14.9**	**15.8**
Latin America and the Caribbean	15.4	18.1	21.1	22.4	24.5	28.3	29.9
Caribbean	13.4	16.1	18.6	19.5	20.9	23.4	24.5
Mesoamerica	20.2	23.4	26.5	27.9	29.9	33.1	34.4
South America	14.1	16.5	19.4	20.7	22.9	26.9	28.6

Source: WHO. 2024. Global Health Observatory (GHO) data repository: Prevalence of obesity among adults, BMI ≥ 30, age-standardized. Estimates by country. [Accessed on 24 July 2024]. https://apps.who.int/gho/data/node.main.A900A?lang=en. Licence: CC-BY-4.0.

In the Caribbean, more than 45 percent of the adult population of the Bahamas and of Saint Kitts and Nevis was affected by obesity in 2022. In Antigua and Barbuda, Barbados, Jamaica, Saint Lucia, and Saint Vincent and the Grenadines, around one-third of the population was affected by obesity. On the contrary, the country with the lowest prevalence in this subregion was Haiti (10.7 percent).

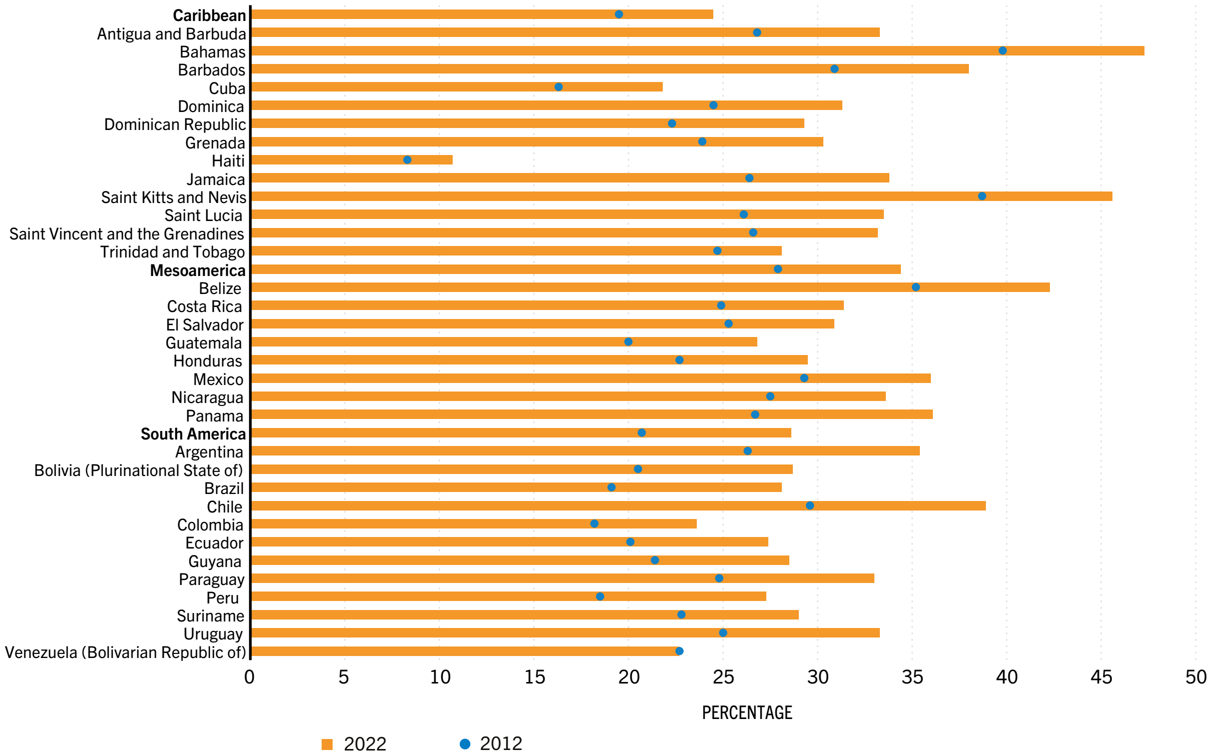
In Mesoamerica, Belize had the highest prevalence of obesity in 2022, estimated at 42.3 percent, followed by Panama and Mexico, with 36.1 and 36.0 percent, respectively. Guatemala had the lowest prevalence in this subregion, though it still affects an important proportion of the population with a prevalence of 26.8 percent among adults.

In South America, more than 30 percent of the adult population in Chile, Argentina, Uruguay and Paraguay was affected by obesity in 2022. Countries with the lowest prevalence were the Bolivarian Republic of Venezuela (22.7 percent) and Colombia (23.6 percent), which are nonetheless significant proportions of the population.

Since 2012, all countries in the region have shown an increase in obesity among adults except the Bolivarian Republic of Venezuela, where the prevalence in both 2012 and 2022 was estimated at 22.7 percent. The largest increases in the last 10 years (comparing 2022 to 2012) were observed in Panama, Chile, Argentina and Brazil, where the prevalence increased by more than 9 percentage points.

FIGURE 15

Prevalence of obesity among adults in Latin America and the Caribbean by country and subregion



Source: WHO. 2024. Global Health Observatory (GHO) data repository: Prevalence of obesity among adults, BMI ≥ 30, age-standardized. Estimates by country. [Accessed on 24 July 2024]. https://apps.who.int/gho/data/node.main.A900A?lang=en. Licence: CC-BY-4.0.

3.2 PREVALENCE OF EXCLUSIVE BREASTFEEDING DURING THE FIRST 6 MONTHS OF LIFE

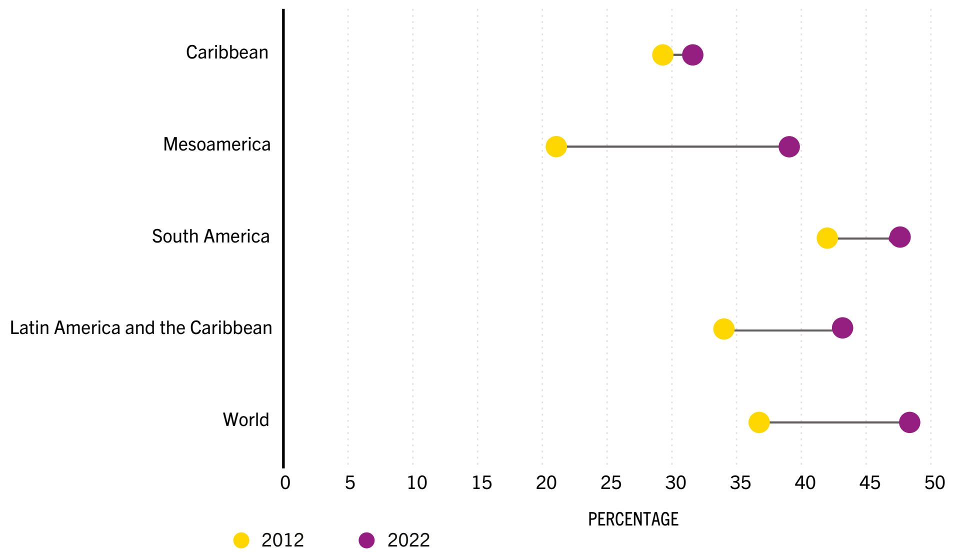
Exclusive breastfeeding for infants under 6 months of age is defined as receiving only breastmilk, with no additional food or drink, not even water. It is a cornerstone of child health and survival, offering the best nutrition for newborns and infants. Breastmilk provides all the energy and nutrients needed during the first months of life, strengthens the immune system, protects against infections and death, and reduces the risk of developing non-communicable diseases. Breastfeeding also benefits mothers by preventing postpartum haemorrhage and promoting uterine involution, decreasing the risk of iron-deficiency anaemia, reducing the risk of various types of cancer, lowering the risk of type 2 diabetes and providing psychological benefits.[6]

Considerable progress has been made since 2012 towards increasing the prevalence of exclusive breastfeeding for infants under 6 months of age. The latest estimate, corresponding to 2022, shows that 48.0 percent of the infants under 6 months in the world were exclusively breastfed, up from 37.1 percent in 2012. Despite this progress, the world is not on track to achieve the 2030 target of 70 percent.

In Latin America and the Caribbean (FIGURE 16), progress has also been made during this period but the region, including all subregions, is below the world average and far off track to achieve the 2030 target. The regional prevalence was estimated at 43.1 percent in 2022, below the global estimate of 48.0 percent, while for the subregions South America had the highest prevalence at 47.1 percent, followed by Mesoamerica (38.7 percent) and the Caribbean (31.4 percent). Mesoamerica had the largest improvement, almost doubling the percentage of infants exclusively breastfed compared to 2012.

FIGURE 17 shows the prevalence of exclusive breastfeeding at the country level corresponding to the two most recent data points available for each country.

FIGURE 16
Prevalence of exclusive breastfeeding among infants 0–5 months of age in Latin America and the Caribbean by subregion

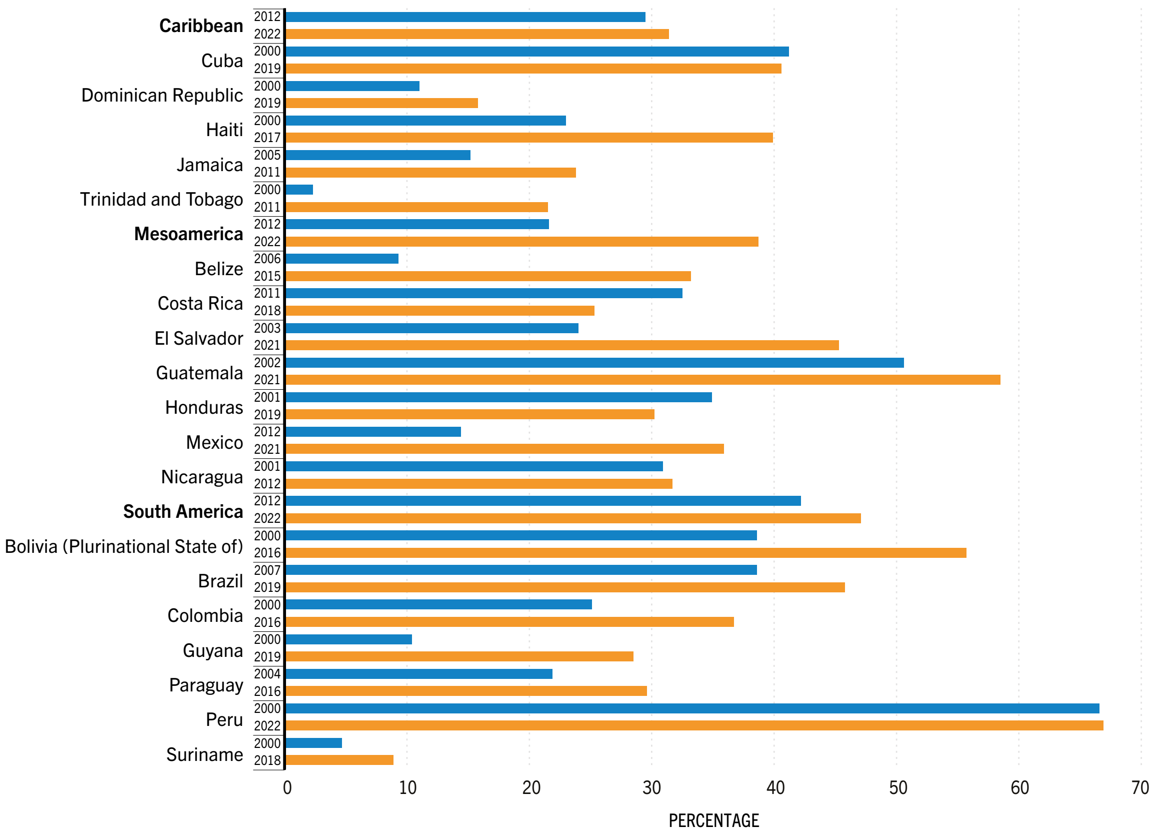


Source: UNICEF. 2024. Infant and young child feeding. In: UNICEF. [Cited 24 July 2024]. https://data.unicef.org/topic/nutrition/infant-and-young-child-feeding

Regarding the latest available data point, the highest prevalence was seen in Peru at 64.6 percent, followed by Guatemala (58.8 percent), Uruguay (57.7 percent) and the Plurinational State of Bolivia (55.7 percent). The countries with the lowest prevalence were Saint Lucia (3.5 percent), Suriname (8.9 percent) and the Dominican Republic (15.8 percent). Comparing this indicator over the years, the countries with important improvements are Mexico with a 21.5 percentage point increase between 2012 and 2021, Belize with a 23.9 percentage point rise between 2006 and 2015 and El Salvador with a 21.3 percentage point increase between 2003 and 2021.

FIGURE 17

Prevalence of exclusive breastfeeding among infants 0–5 months of age in Latin America and the Caribbean by country and subregion



Note: Countries with only one observation are not shown on the figure. These are Argentina (32.0 percent in 2011), Barbados (19.7 percent in 2012), Ecuador (39.6 percent in 2004), Panama (21.5 percent in 2013), Saint Lucia (3.5 percent in 2012) and Uruguay (57.7 percent in 2018).
Source: UNICEF. 2024. Infant and young child feeding. In: UNICEF. [Cited 24 July 2024]. https://data.unicef.org/topic/nutrition/infant-and-young-child-feeding

3.3 PREVALENCE OF LOW BIRTHWEIGHT

Low birthweight is defined by WHO as weight at birth lower than 2.5 kg (5.5 lb) and can be caused by intrauterine growth restriction, prematurity or both. Low birthweight constitutes a significant public health problem globally and is associated with a range of both short and long-term consequences, such as foetal and neonatal mortality and morbidity, impaired growth and cognitive development, as well as an increased risk of non-communicable diseases later in life.[7]

Estimates from 2020 show that Latin America and the Caribbean had a prevalence of low birthweight of 9.6 percent, which was lower than the global estimate (14.7 percent). As shown in TABLE 12, no significant changes have been observed since 2000 in the region. A decrease in the global prevalence by 1.9 percentage points was observed in the period 2000–2020, while at the regional level it increased slightly by 0.3 percentage point. When analysed by subregion, the Caribbean showed a prevalence of low birthweight of 11.7 percent, with an increase of almost 1 percentage point in this period, followed by Mesoamerica (10.9 percent) and finally South America (8.8 percent), meaning that all three subregions are below the global estimate.

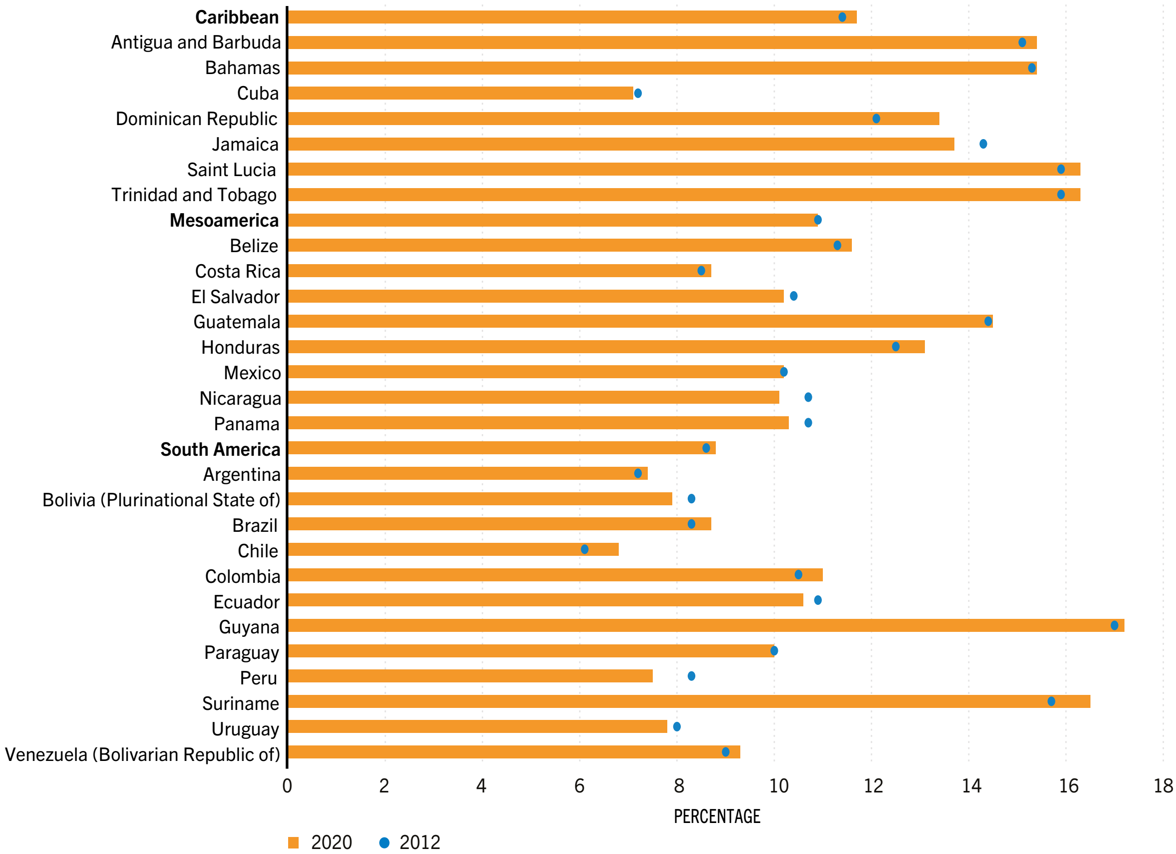
TABLE 12
Prevalence of low birthweight (percent)

	2000	2005	2010	2015	2019	2020
World	**16.6**	**16.1**	**15.3**	**14.8**	**14.6**	**14.7**
Latin America and the Caribbean	9.3	9.4	9.5	9.5	9.6	9.6
Caribbean	10.8	11.1	11.3	11.5	11.7	11.7
Mesoamerica	10.6	10.7	10.8	10.9	10.9	10.9
South America	8.5	8.6	8.6	8.7	8.8	8.8

Source: UNICEF & WHO. 2023. Low birthweight. In: UNICEF. [Cited 24 July 2024]. https://data.unicef.org/topic/nutrition/low-birthweight; UNICEF & WHO. 2023. Joint low birthweight estimates. In: WHO. [Cited 24 July 2024]. www.who.int/teams/nutrition-and-food-safety/monitoring-nutritional-status-and-food-safety-and-events/joint-low-birthweight-estimates

FIGURE 18 shows the latest data available for the prevalence of low birthweight in countries of the region. The countries with the highest prevalence in 2020 were Guyana (17.2 percent), Suriname (16.5 percent), Saint Lucia (16.3 percent) and Trinidad and Tobago (16.3 percent). At the other end of the spectrum, Chile (6.8 percent), Cuba (7.1 percent) and Argentina (7.4 percent) registered the lowest prevalence in the region. Considering the period 2012–2020, Peru, Jamaica and Nicaragua show the highest reductions in this indicator (0.8, 0.6 and 0.6 percentage point, respectively). The countries that show the largest increase for the same period are the Dominican Republic (1.3 percentage points) and Suriname (0.8 percentage point).

FIGURE 18
Prevalence of low birthweight in Latin America and the Caribbean by country and subregion



Source: UNICEF & WHO. 2023. Low birthweight. In: UNICEF. [Cited 24 July 2024]. https://data.unicef.org/topic/nutrition/low-birthweight; UNICEF & WHO. 2023. Joint low birthweight estimates. In: WHO. [Cited 24 July 2024]. www.who.int/teams/nutrition-and-food-safety/monitoring-nutritional-status-and-food-safety-and-events/joint-low-birthweight-estimates

CHAPTER 4

UPDATES TO THE COST AND AFFORDABILITY OF A HEALTHY DIET

Key messages

- New price data and methodological changes regarding the cost and affordability of a healthy diet indicators have resulted in more accurate estimates.
- In 2022, the average cost of a healthy diet in the world was estimated at 3.96 purchasing power parity (PPP) dollars per person per day, up from 3.56 PPP dollars in 2021. Latin America and the Caribbean had the highest cost of a healthy diet at 4.56 PPP dollars, followed by Asia at 4.20 PPP dollars, Africa at 3.74 PPP dollars, Northern America and Europe at 3.57 PPP dollars and Oceania at 3.46 PPP dollars.
- The Caribbean is the subregion with the highest cost within the region at 5.16 PPP dollars per person per day, followed by South America at 4.29 PPP dollars and Mesoamerica at 4.05 PPP dollars.
- Compared to 2021, the cost of a healthy diet increased by 11.8 percent in the region. Across the subregions, the cost of a healthy diet increased by 12.5 percent in Mesoamerica, 11.7 percent in South America and 11.4 percent in the Caribbean.
- Given its cost, 27.7 percent of the population in the region, or 182.9 million people, could not afford a healthy diet in 2022. Compared to 2021, this proportion decreased by 2.4 percentage points, which is equivalent to 14.3 million more people being able to afford a healthy diet.
- In the Caribbean, 50 percent of the population could not afford a healthy diet in 2022, followed by Mesoamerica with an estimated proportion of 26.3 percent and South America at 26 percent.

A healthy diet is defined as a balanced, moderate, diverse and adequate selection of foods comsumed over a period of time. It protects against malnutrition in all its forms, as well as NCDs, and ensures that the needs for macronutrients (proteins, fats and carbohydrates including dietary fibres) and essential micronutrients (vitamins, minerals and trace elements) are met, specific to the person's gender, age, physical activity level and physiological state.[8]

The cost of a healthy diet indicator is the cost of purchasing the least expensive locally available foods that meet the energy requirements and food-based dietary guidelines (FBDGs) for a representative person within an energy balance at 2 330 kcal/day. The cost of a healthy diet is converted to international dollars using purchasing power parity. After the cost is calculated, it is compared to a country's income distribution to determine what percentage of the population is unable to access a healthy diet, and finally the number of people unable to afford a healthy diet is calculated.[9]

In this version of the report, all indicators on the cost and affordability of a healthy diet are updated as of 2022 following two major changes. First, estimates from 2017 to 2022 regarding the cost of a healthy diet were calculated using data from the latest round of the International Comparison Programme released by the World Bank in 2021, which replaces the previous data from the 2017 round of the programme. Second, an important revision was made in the method to compute the affordability of healthy diet indicators. Specifically, in previous editions of the regional report, the amount of money required for basic non-food needs was determined as a fixed proportion of the household's disposable income (48 percent). The same percentage was applied to all countries, justified by the observation that, on average, people in low-income countries spend 52 percent of their income on food. In this year's edition a new method is introduced, which is based on the World Bank's income classification of a country. The new method involves multiplying country income group-specific international poverty lines by the non-food expenditure shares for each country income group to calculate the daily cost of basic non-foods in a country.[a]

In 2022, Latin America and the Caribbean had the highest average cost of a healthy diet, estimated at 4.56 PPP dollars per person per day, above the global average of 3.96 PPP dollars (TABLE 13). Since the start of the series in 2017, this has been the trend for the region, constantly above the global level. Latest data shows that the trend of an increase in the cost of a healthy diet observed since the start of the series continued for the 2021–2022 period, with an accentuated increase in the final year, showing a 11.8 percent rise in the cost of a healthy diet for the region compared to 2021 (FIGURE 19). Among the subregions, in 2022, the Caribbean had the highest cost within the region at 5.16 PPP dollars per person per day, followed by South America at 4.29 PPP dollars and Mesoamerica at 4.05 PPP dollars. Between 2021 and 2022, the cost of a healthy diet increased by 12.5 percent in Mesoamerica, 11.7 percent in South America, and 11.4 percent in the Caribbean. Comparing the price increase between 2017 and 2022, the cost of a healthy diet increased by 28 percent in the Caribbean, 25.4 percent in South America and 25 percent in Mesoamerica.

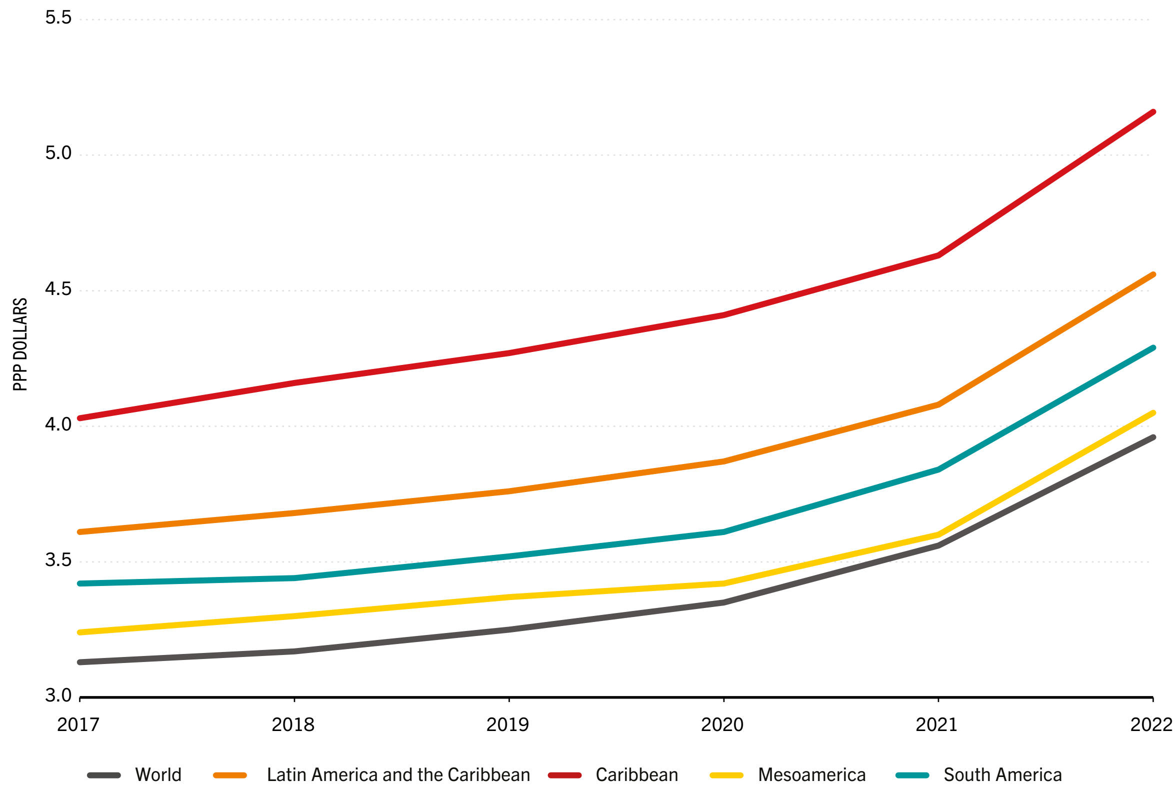
TABLE 13
Cost of a healthy diet (purchasing power parity international dollars)

	2017	2018	2019	2020	2021	2022
World	**3.13**	**3.17**	**3.25**	**3.35**	**3.56**	**3.96**
Latin America and the Caribbean	3.61	3.68	3.76	3.87	4.08	4.56
Caribbean	4.03	4.16	4.27	4.41	4.63	5.16
Mesoamerica	3.24	3.30	3.37	3.42	3.60	4.05
South America	3.42	3.44	3.52	3.61	3.84	4.29

Source: 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.

[a] Annex 1B in The State of Food Security and Nutrition 2024 offers a more detailed explanation of this methodological change.

FIGURE 19
Cost of a healthy diet in Latin America and the Caribbean by subregion



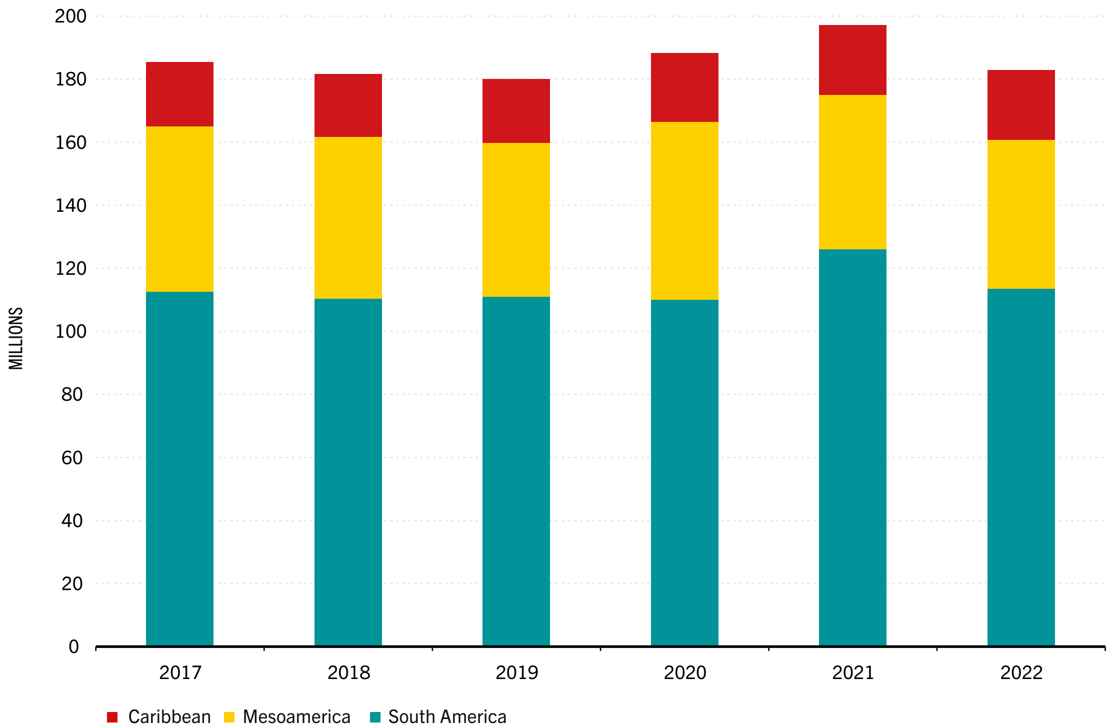
Source: FAO. 2024. FAOSTAT: Cost and Affordability of a Healthy Diet (CoAHD). [Accessed on 24 July 2024]. https://www.fao.org/faostat/en/#data/CAHD. Licence: CC-BY-4.0.

In 2022, 2.8 billion people globally could not afford the cost of a healthy diet, which is equivalent to 35.4 percent of the population (TABLE 14). These new estimates show that there has been a reduction in unaffordability at a global level of 1 percentage point compared to 2021, meaning a decrease of 50.1 million people who are unable to afford a healthy diet. This has not been the case for all regions, as unaffordability dropped below pre-pandemic levels in Asia, Latin America and the Caribbean, Northern America and Europe, while increasing substantially in Africa.

In Latin America and the Caribbean, 182.9 million people (27.7 percent) could not afford a healthy diet in 2022. Compared to 2021, this proportion decreased by 2.4 percentage points, which is equivalent to 14.3 million more people being able to afford a healthy diet. In the Caribbean, 50 percent of the population could not afford a healthy diet in 2022, equivalent to 22.2 million people, followed by Mesoamerica, with this proportion estimated at 26.3 percent, or 47.1 million people, and South America at 26 percent, equivalent to 113.6 million people.

FIGURE 20 shows the number of people unable to afford a healthy diet in Latin America and the Caribbean by subregion. After a two-year increase between 2019 and 2021 in the number of people unable to afford a healthy diet in the region, in 2022 a reduction of 14.3 million people was observed in this indicator. The variation in the number of people unable to afford a healthy diet between 2021 and 2022 was mainly driven by the decrease in South America, as 12.4 million fewer people were unable to afford a healthy diet in this period. In Mesoamerica, a reduction of 2 million people was observed, while in the Caribbean the number of people unable to afford a healthy diet increased by 100 000.

FIGURE 20
Number of people unable to afford a healthy diet in Latin America and the Caribbean by subregion



Source: 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.

TABLE 14
Number of people unable to afford a healthy diet (millions)

	2017	2018	2019	2020	2021	2022
World	**3 062.3**	**2 916.1**	**2 823.4**	**2 968.0**	**2 876.4**	**2 826.3**
Latin America and the Caribbean	185.5	181.8	180.0	188.1	197.2	182.9
Caribbean	20.4	19.9	20.1	21.8	22.1	22.2
Mesoamerica	52.6	51.5	48.9	56.3	49.1	47.1
South America	112.5	110.3	111.0	110.1	126.0	113.6

Source: 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.

The percentage of people unable to afford a healthy diet varies considerably among subregions and countries (FIGURE 21). Between 2021 and 2022 in South America, the number of people unable to afford a healthy diet decreased by 9.8 percent, while in Mesoamerica, the reduction was 4.1 percent. In the Caribbean, however, the number increased by 0.5 percent.

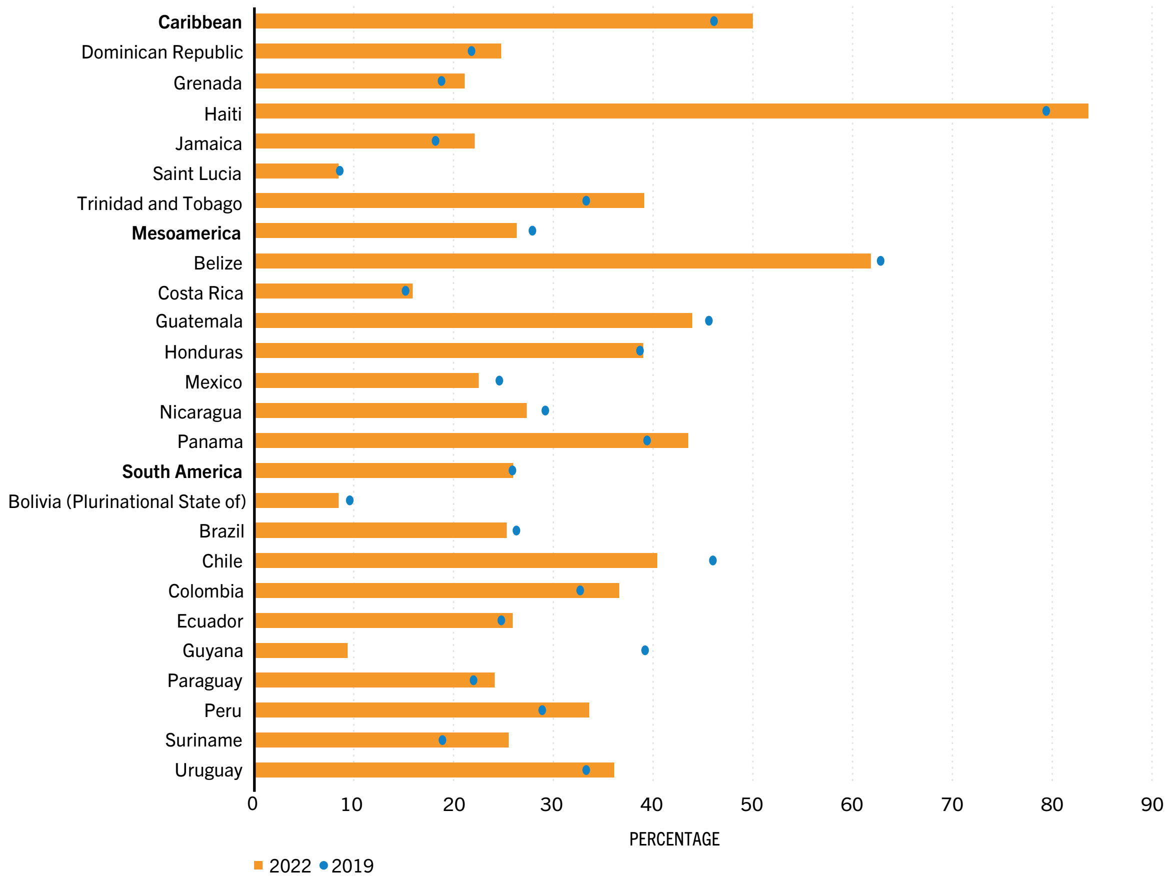
In the Caribbean, 83.6 percent of the population of Haiti could not afford a healthy diet in 2022, while nearly 40 percent of the population of Trinidad and Tobago faced the same situation. At the other end of the spectrum, Saint Lucia, Grenada and Jamaica were the countries with the lowest percentage of people who could not afford a healthy diet, estimated at 8.5, 21.1 and 22.1 percent, respectively.

In Mesoamerica, the countries with the highest percentage of people unable to afford a healthy diet were Belize, Guatemala and Panama, estimated at 61.8, 43.9 and 43.5 percent, respectively. The countries with the lowest proportion of the population being unable to afford a healthy diet in this subregion were Costa Rica (15.9 percent), Mexico (22.5 percent) and Nicaragua (27.3 percent).

In South America, Chile, Colombia and Uruguay were the countries with the highest proportion of the population being unable to afford a healthy diet, estimated at 40.4, 36.6 and 36.1 percent, respectively, in 2022. The Plurinational State of Bolivia (8.5 percent), Guyana (9.4 percent) and Paraguay (24.1 percent) had the lowest percentage of the population unable to afford a healthy diet.

FIGURE 21

Percentage of people unable to afford a healthy diet in Latin America and the Caribbean by country and subregion



Source: 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.

PART 2
CLIMATE VARIABILITY AND EXTREMES AND FOOD SECURITY AND NUTRITION

The 2021 edition of The State of Food Security and Nutrition in the World provided an analysis of the major drivers of the current food security and nutrition trends in the world, which are: conflict, climate variability and extremes, and economic slowdowns and downturns, combined with underlying structural factors such as high and persistent inequality, unhealthy food environments, and the lack of access to and unaffordability of healthy diets. These major drivers are increasing in frequency and intensity and are occurring simultaneously in countries along with other factors that create multiple, compounding impacts on agrifood systems that seriously undermine food security and nutrition.[10]

In recent years, the region has been significantly affected by different shocks, including price spikes that have translated into increased inflation rates. Although inflation has been falling, as of March 2024 it remained above pre-pandemic levels.[11] [11]In addition, conflicts continue to threaten local, regional and global food security.

In Latin America and the Caribbean, economic slowdowns are a key factor affecting food security and nutrition. Countries experiencing economic downturns exhibit both the highest prevalence of undernourishment and the steepest increases in its rates in the region. Despite economic contractions during the COVID-19 pandemic, the economic recovery has resulted in reductions in poverty[12] and in increased food security. Therefore, it is important to take a closer look at the other relevant drivers.

According to *The State of Food Security and Nutrition in the World 2024* report, 20 countries in Latin America and the Caribbean had high exposure, meaning that they experienced high frequency or intensity of climate extremes, and 14 were also highly vulnerable to extreme climate events and to climatic factors, in the period 2013–2022. This means they have a series of conditions that increase the susceptibility of a household to the effects of extreme climate events on food security (see BOX 1 for definitions of terms).[13]

Climate variability and extremes produce multiple pressures on agrifood systems that can affect food security and nutrition. They have various effects on the different dimensions of food security,[14,15] affecting agricultural productivity due to crop losses or reduced production, and the functioning of food supply chains due to disruptions in infrastructure, transport and food distribution. This could also lead to changes in food trade by generating an increase in imports to offset production losses. Furthermore, climate variability and extremes impact food access and consumption.[16] The impact of climate extremes on livelihoods is directly related to a decrease in incomes, particularly for those who depend on natural resources related to agriculture and food production, which reduces their ability to purchase food.[17] Additionally, production losses may drive an increase in consumer food prices, leading to a decrease in access to and affordability of healthy diets. As people's purchasing power is reduced, food consumption patterns are impacted since food security, dietary diversity and the nutritional quality of food consumed tends to decrease.[18,19] Finally, climate variability and extremes can affect the supply of drinking water, which can have implications for food safety and, therefore, for food security and nutrition.[20]

Although the increasing intensity and frequency of climate extremes can be partly attributed to climate change, this report does not look at the cause of such increases. Rather, the report analyses the occurrence of climate variability and extremes, as well as the association between climate extremes and the four dimensions of food security. Climate variability refers to variations in the mean state and other statistics of climate on all spatial and temporal scales beyond that of individual weather events. This variability may be due to natural internal processes within the climate system, or to variations in natural or anthropogenic external forcing. On the other hand, an extreme climate event is the occurrence of a weather or climate variable above (or below) a threshold value near the upper (or lower) ends of the range of observed values for the variable (BOX 1).[21]

Climate extremes, such as drought, flooding, heatwaves and storms can severely impact food security, water access, healthcare systems and household economies, all of which are critical factors in child nutrition and growth. These disruptions create conditions that contribute to stunting in children, particularly in vulnerable and low-income communities.[22]

However, in the context of climate change, the main concern is that both climate variability and extremes are exacerbated in both occurrence and intensity, presenting important challenges for food security and nutrition now and in the future.

There is compelling evidence of global climate change in the form of rising air and sea surface temperatures, receding glaciers, shifting climate patterns, more frequent and severe extreme climate events and rising sea levels. The accelerated warming of the planet is altering ecosystem processes, intensifying climate variability and climate-related events, and it is affecting temperatures with both cold and hot extremes changing climate variability and intensifying climate-related events, as well as altering precipitation patterns with increased occurrences of flooding and drought.[23]

New evidence strengthens the conclusion of the Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming of 1.5 °C (SR1.5) that even smaller incremental increases in global warming (+0.5 °C) are associated with significant changes in climate extremes globally and for large regions. This is the case of extreme temperatures and the intensification of precipitation, including those events associated with tropical cyclones, as well as worsening drought in some regions.[24]

The effects produced by climate variability and extremes may have a significant impact on the four dimensions of food security[25,26] and nutrition, affecting the availability (CHAPTER 6.3), access (CHAPTER 6.4), utilization (CHAPTER 6.5) and stability (CHAPTER 6.6) of the food supply.

The impacts of extreme climate events do not affect all subgroups of the population equally, since they mostly affect family farmers,[27] Indigenous Peoples,[28] women[29] and young children.[30] In general, the structural vulnerabilities faced by these population groups tend to exacerbate conditions of poverty, food insecurity and malnutrition during periods of economic slowdowns and downturns, or after conflict or climate-related disasters.[31]

While evidence is accumulating globally showing the link between climate variability and extremes, and food security and nutrition,[32] the evidence specific to Latin America and the Caribbean is more limited. Specific information for the region would help in generating effective policies and actions to support different actors in agrifood systems and vulnerable groups, with the aim of strengthening climate resilience and moving towards the greater sustainability of these systems to improve food security and nutrition.

Considering the importance of this topic for Latin America and the Caribbean, this edition of the *Latin America and the Caribbean Regional Overview of Food Security and Nutrition* presents the available evidence and data analysis on climate variability and extremes, explaining how they relate to food security and nutrition, and proposing policies and recommendations that can contribute to enhancing the resilience of agrifood systems in order to ensure food security and nutrition in a context of increasing climate variability and extremes. The objective of this chapter is to provide guidance on how the Food and Agriculture Organization of the United Nations (FAO) Members can overcome the challenges posed by climate-related events, underscoring that resilient and sustainable agrifood systems are essential for achieving the SDGs and targets of the 2030 Agenda, especially Target 2.1 (End hunger and food insecurity) and Target 2.2 (End all forms of malnutrition). The final section highlights policies and actions implemented in Latin America and the Caribbean, and also proposes recommendations to promote and develop the climate resilience of agrifood systems to achieve food security and nutrition in the context of the growing frequency and intensity of climate variability and extremes.

BOX 1
DEFINITIONS

Climate

Climate, in a narrow sense, is usually defined as the average weather or, more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization (WMO). The relevant quantities used are most often surface variables such as temperature, precipitation and wind.[33]

Climate change

Climate change refers to a change in the state of the climate that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere or in land use.[34]

Climate disturbances or shocks

Climate shocks not only include those disturbances in the usual precipitation and temperatures, but also complex events such as drought and flooding. Equivalent to the concept of natural hazard or stress, these are exogenous events that can have a negative impact on food security and nutrition, depending on the vulnerability of an individual, household or system to the shock. [35]

Climate extreme (extreme weather or climate event)

The occurrence of a value of a weather or climate variable above (or below) a threshold value near the upper (or lower) ends of the range of observed values of the variable. Many weather and climate extremes are a result of natural climate variability, and natural decadal or multi-decadal variations in the climate provide the backdrop for anthropogenic climate change. Even if there were no anthropogenic changes in climate, a wide variety of natural weather and climate extremes would still occur. For simplicity, both extreme climate events and extreme weather events are collectively referred to as "climate extremes".[36]

Climate variability

Refers to variations in the mean state and other statistics (standard deviations, the occurrence of extremes, etc.) of the climate on all spatial and temporal scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system (internal variability) or to variations in natural or anthropogenic external forcing (external variability).[37]

Resilience

The capacity of individuals, households, communities, cities, institutions, systems and societies to prevent, resist, absorb, adapt, respond and recover positively, efficiently and effectively when faced with a wide variety of risks, while maintaining an acceptable level of functioning and without jeopardizing the long-term prospects for sustainable development, peace and security, human rights and well-being for all.[38]

Weather

Conditions of the atmosphere over a short period of time (minutes to days), whereas climate is how the atmosphere behaves over relatively longer periods of time (the long-term average of weather over time). The difference between weather and climate is a measure of time (see above definitions for climate, climate change, climate variability and climate extremes).

CHAPTER 5
CLIMATE EXTREMES IN LATIN AMERICA AND THE CARIBBEAN

Key messages

- The frequency of climate extremes has increased considerably in recent decades in Latin America and the Caribbean with varying consequences according to subregion, country and territory.
- Between 1990 and 2023, while Mesoamerica and the Caribbean exhibit relatively modest increases in the number of extreme climate events indicating slow but steady growth, South America shows a more pronounced trend with an increase of 75.6 percent in the average number of climate-related hazards per year.
- The frequency of drought in the region as a whole increased from 3.0 times per year in the 1990–2000 period to 3.3 times in the 2013–2023 period, while the average number of flood-related events doubled, going from 16 to 32.1 events per year. In addition, storm-related events increased almost 40.0 percent, going from 10.1 to 14.3 per year across the region.
- Very hot days are becoming more frequent and maximum temperatures are increasingly higher. Data from recent decades reveals a clear trend of an increasing frequency of hot days in Latin America and the Caribbean. Furthermore, in recent years almost the entire region shows increases in air temperature, compared to a reference period from 1960 to 1991.
- Regarding rain deficit and drought, recent precipitation data shows anomalies compared to the historical average. In addition to greater variation in precipitation patterns, some areas have experienced multiple years of severe drought over the past decade.

Many climate extremes are the result of natural climate variability, and natural decadal or multi-decadal variations in the climate provide the backdrop for anthropogenic climate change. Even if there were no anthropogenic changes in climate, a wide variety of natural climate extremes would still occur (BOX 1). Countries are facing a greater frequency of climate extremes linked in part to climate change.[39] Furthermore, according to the IPCC, the effects of the increase in extreme climate events have been felt with greater intensity in Mesoamerica, South America and in Small Island Developing States.[b,40]

In Latin America and the Caribbean, the frequency of climate extremes has increased considerably in recent decades. Between 1990 and 2000, an average of 36.8 climate extremes occurred in the region per year, while between 2010 and 2023 the frequency was close to 55.1 events per year, which represents an increase of 50.0 percent. This increase is not driven by a single type of event, but rather is reflected in an upward trend of the combination in all types of events.[41]

Also, one of the most significant climate variability events on the planet, El Niño Southern Oscillation (ENSO) has major influences on the climate of Latin America and the Caribbean, affecting rainfall, temperature and climate extremes (BOX 2).

Climate extremes impact food value chains putting the whole agriculture sector at risk, affecting the four dimensions of food security (CHAPTER 6) and nutrition. This is due to productivity losses that affect the quantity and quality of food produced, with the subsequent price volatility and loss of income.[42] Considering the latter, an analysis of climate extremes, particularly their trends in recent years, and the frequency and intensity of events at both the regional and subregional level, is key to a deeper understanding of how these events could impact food security and nutrition.

[b] The report also mentions Africa, Asia and the Arctic.

BOX 2

THE RELATIONSHIP BETWEEN CLIMATE VARIABILITY AND THE EL NIÑO SOUTHERN OSCILLATION PHENOMENON

El Niño Southern Oscillation (ENSO) is a complex climate phenomenon that involves periodic variations in sea surface temperatures and atmospheric pressure in the tropical Pacific Ocean. ENSO has two distinct phases – El Niño and La Niña – with opposite effects on global weather patterns. These phases significantly influence climate variability around the world, including in Latin America and the Caribbean, affecting rainfall, temperature and extreme weather events.[43]

ENSO is a naturally occurring phenomenon that involves fluctuating ocean temperatures in the central and eastern equatorial Pacific, coupled with changes in the atmosphere. This phenomenon has a major influence on climate patterns in various parts of the world. El Niño and La Niña are the components that relate to the ocean while the Southern Oscillation is the atmospheric counterpart.

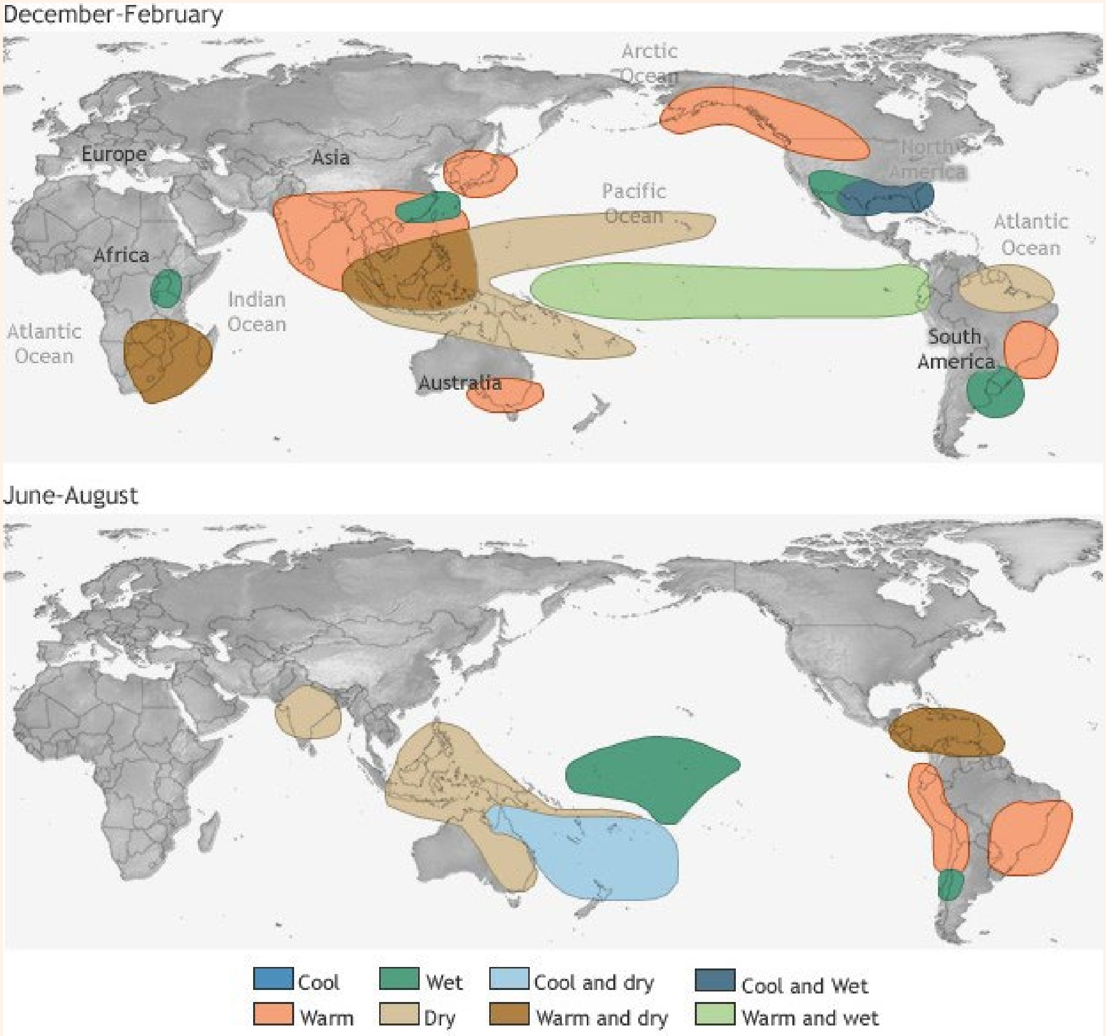
The cool phase of this phenomenon is known as La Niña, which, in 2022, evolved into a moderate-strength event that continued throughout the year. This phenomenon was associated with higher air temperatures and precipitation deficits in northern Mexico, a prolonged period of drought in much of southeastern South America, and increased precipitation in parts of Mesoamerica, northern South America and the Amazon region.

El Niño, which is the warm phase, affects weather during different seasons in different regions of the world (FIGURE A). El Niño repeats every two to seven years and usually lasts between nine and 12 months. The 2015–2016 El Niño was extreme and one of the most intense in the last 100 years, affecting approximately 60 million people worldwide and leading to a decline in the global production of staple crops such as wheat, rice and maize. Numerous extreme weather events were observed during this period, including cyclones, flooding, severe drought and extreme temperatures. Large areas of the Caribbean, Mesoamerica and South America were affected by drought conditions over this period, which affected both people and agriculture.[44]

The World Meteorological Organization (WMO) forecasted that the El Niño event, which began in 2023, would be one of the five strongest on record. It is likely to increase global temperatures and cause widespread disruptions to climate patterns.[45]

Regarding food crises,[*] climate extremes were a more prominent driver in 2023 compared to 2022 due to El Niño, which resulted in erratic and reduced rainfall across the region. This mainly affected regions in Colombia, El Salvador, Guatemala, Honduras, Nicaragua, Haiti and the Dominican Republic. Several impacts were expected, such as below-average cereal production in Haiti, while erratic rainfall reduced crop yields and resulted in crop damage in some areas, mainly affecting subsistence farmers. In El Salvador and Nicaragua's Dry Corridor, insufficient rainfall and higher-than-normal temperatures, which are often linked to the El Niño phenomenon, contributed to below-average yields in some areas (FSIN and Global Network Against Food Crises, 2024). In Guatemala, due to the drought caused by the 2015–2016 El Niño phenomenon, more than 3.6 million people needed humanitarian aid.[46]

FIGURE A.
Climate impacts of El Niño



Note: Refer to the disclaimer page for the names and boundaries used in this map.
Source: NOAA (National Oceanic and Atmospheric Administration). Global Impacts of El Niño and La Niña. In: NOAA. [Accessed August 10 2024]. https://www.climate.gov/news-features/featured-images/global-impacts-el-ni%C3%B1o-and-la-ni%C3%B1a

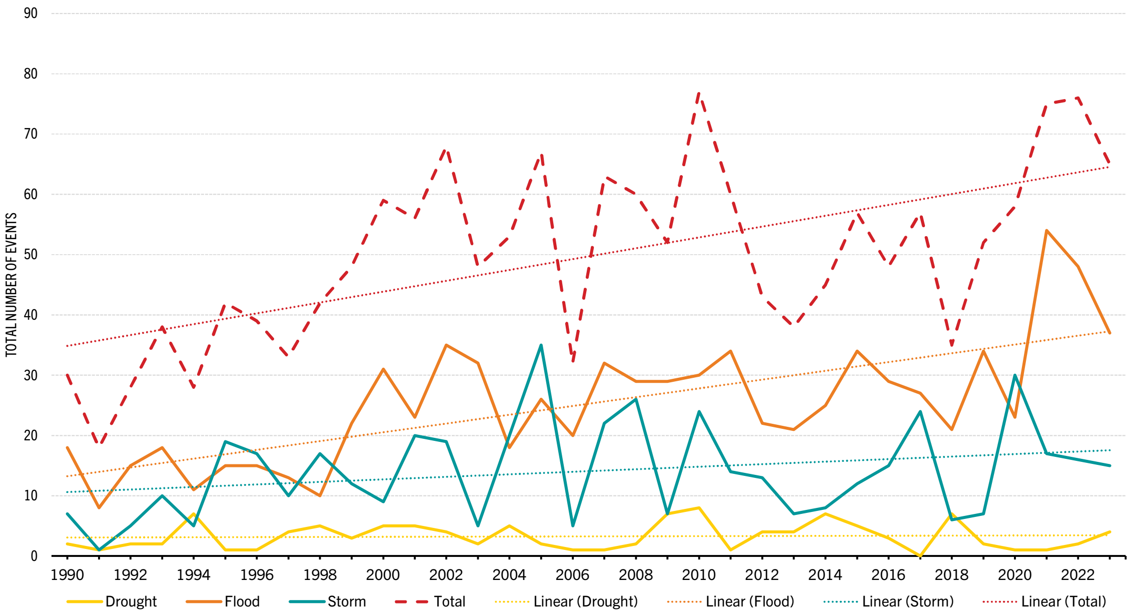
[*] The Global Report on Food Crises 2024 defines a food crisis as a situation in which acute food insecurity requires urgent action to protect and save lives and livelihoods at local or national levels and exceeds the local resources and capacities to respond. Food crises are more likely among populations already suffering from prolonged food insecurity and malnutrition, and in areas where structural factors increase their vulnerability to shocks. They can occur anywhere and can have global ramifications. Furthermore, the capacity of governments to respond can influence the magnitude and severity of food crises. See FSIS (Food Security Information Systems). 2024. Global Report on Food Crises 2024. Rome. https://www.fsinplatform.org/report/global-report-food-crises-2024/

5.1. GREATER FREQUENCY AND INTENSITY OF CLIMATE EXTREMES IN THE REGION

The frequency of climate extremes has increased considerably in recent decades in Latin America and the Caribbean (FIGURE 22). The frequency of drought increased from 3.0 per year in the period of 1990–2000 to 3.3 in the period 2013–2023, while the average number of flood-related events doubled, going from 16.0 to 32.1 events per year over the same periods. Storm-related events increased almost 40.0 percent, going from 10.1 to 14.3 per year across the region.[47]

FIGURE 22

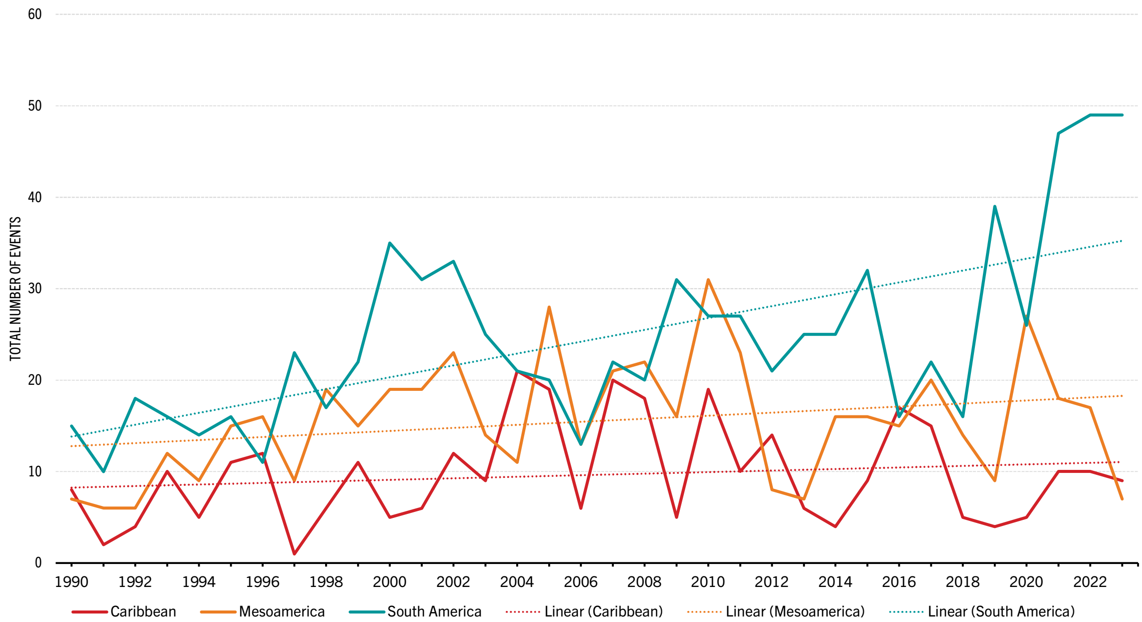
Number of extreme climate events in Latin America and the Caribbean by type, 1990–2023



Note: Total number of extreme climate events that occurred in Latin America and the Caribbean by type of phenomenon during the period 1990–2023. Extreme climate events are defined as medium or large-scale events that exceed the threshold established for registration in the international disaster database EM-DAT.
Source: Author's own elaboration based on EM-DAT & CRED/UCLouvain. EM-DAT. [Accessed August 10 2024]. www.emdat.be

The illustration by subregion highlights clear upward trends in the occurrence of climate extremes across all three subregions (FIGURE 23). Comparing the periods 1990–2000 and 2013–2023, in the Caribbean, the average number of events per year increased 25.0 percent, from 6.8 to 8.5 events. In Mesoamerica, the increase was also 25.0 percent, rising from 12.1 to 15.1 events per year. South America experienced the largest increase from 17.9 to 31.5 events per year, which represents an increase of 75.6 percent. This important increase in South America could be explained by the deforestation in the Amazon, which has reduced evapotranspiration and intensified the dry season so that temperatures have risen more than in other areas.[48] Also in the subregion, urban flooding in the Río de la Plata basin has become more common.[49]

FIGURE 23
Number of extreme climate events in Latin America and the Caribbean by subregion, 1990–2023



Note: Total number of extreme climate events that occurred in Latin America and the Caribbean by subregion during the period 1990–2023. Extreme climate events are defined as medium and large-scale events that exceed the thresholds established for registration in the international disaster database EM-DAT.
Source: Author's own elaboration based on EM-DAT & CRED/UCLouvain. EM-DAT. [Accessed August 10 2024]. www.emdat.be

As discussed in the next sections, climate extremes such as rising temperatures, rain deficits, drought, flooding and storms can lead to unsustainable agrifood systems, which in turn impact food security and nutrition.

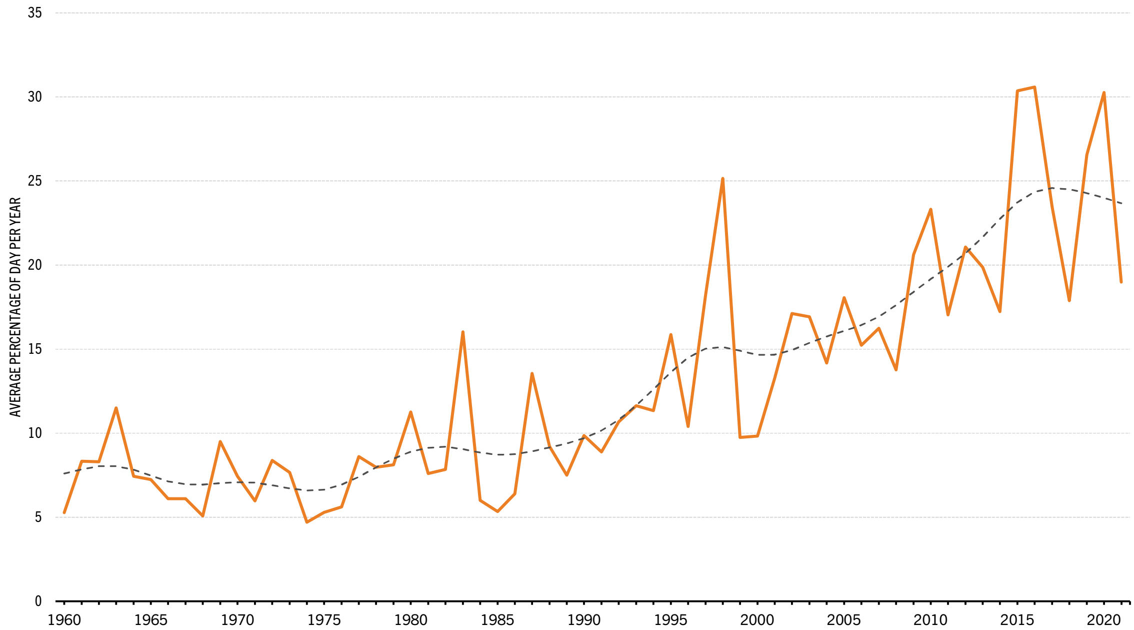
Rising temperatures in Latin America and the Caribbean

Rising global temperatures, driven primarily by increased greenhouse gas (GHG) emissions, contribute to greater climate variability and more frequent extreme events such as heatwaves. When comparing the 2011–2020 period with 1850–1900, which is considered the pre-industrial baseline, global surface temperature was approximately 1.1 ºC higher.[50] Data from recent decades reveals a clear trend of increasing frequency of hot days in Latin America and the Caribbean (FIGURE 24). These events directly and indirectly affect agricultural production.[51]

Extreme heat causes increased livestock mortality rates, reduced work capacity, decreased agricultural yields, and it negatively impacts fisheries and aquaculture by affecting fish stocks, seafood safety and aquatic ecosystems. For example, in the livestock subsector, heat stress can affect mortality rates, live weight gain, milk production and animal fertility.[52] Prolonged exposure to higher temperatures often leads to more intense dry periods, reducing water availability and exacerbating crop losses, which limits feed for livestock. Additionally, heat stress can weaken the immune systems of animals, making them more susceptible to diseases and reducing their resilience to other environmental stressors. These combined effects result in lower livestock productivity and increased mortality, further undermining food security and nutrition in regions dependent on livestock for food and income.

FIGURE 24

Average percentage of days in the year with temperatures above the 90th percentile in Latin America and the Caribbean



Note: The graph shows the average percentage of days per year for the entire Latin American and Caribbean region in which the daily maximum temperature is above the 90th percentile (TX90p). The blue line represents the original data, while the dashed black line represents the series smoothed by a 21-year Gaussian pattern, which helps to reduce possible short-term variations and capture a clearer view of long-term changes while taking into account that not all events follow a linear pattern.

Source: Author's own elaboration based on time series data provided by BEST (Berkeley Earth Surface Temperature). n.d. BEST. [Accessed August 10 2024]. https://berkeleyearth.org/data/. Dataset details available: in Rohde, R., Muller, R.A., Jacobsen, R., Muller, E., Perlmutter, S., Rosenfeld, A., Wickham, C. et al. 2013. A new estimate of the average Earth surface land temperature spanning 1753 to 2011. Geoinfor Geostat: An Overview 1: 1.

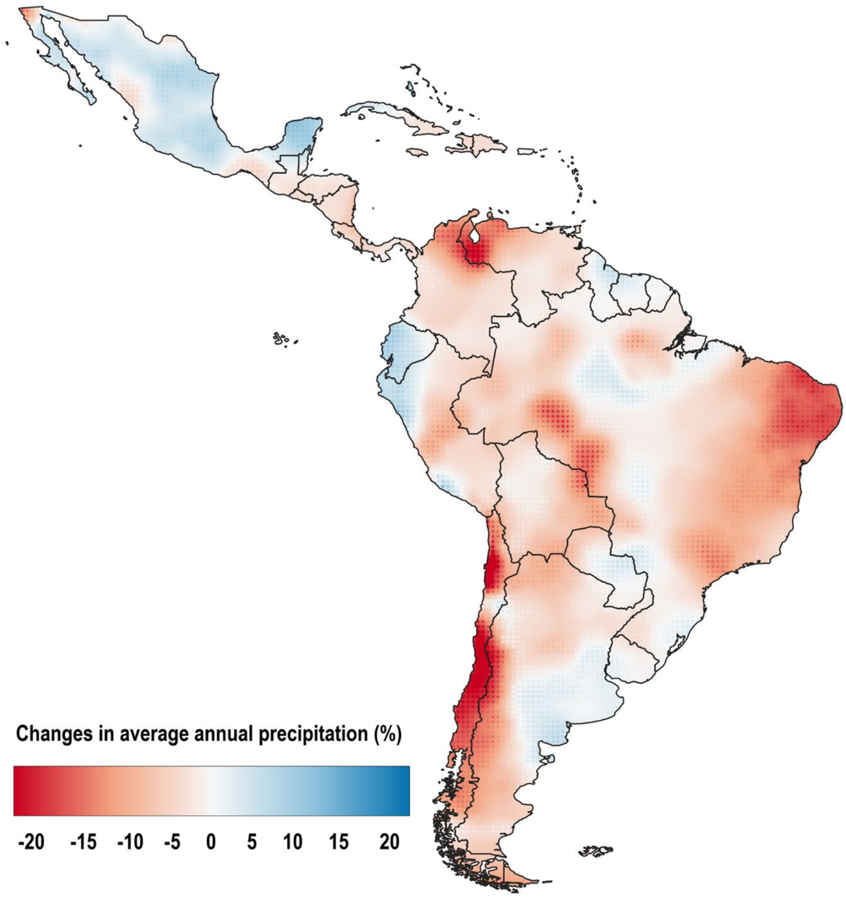
Rain deficit and drought

Among the various hazards affecting agriculture, drought has a disproportionate impact on the sector, accounting for more than 60 percent of agricultural losses worldwide.[53] These droughts are often classified as slow-onset events, but in terms of consequences and response strategies they are often similar to sudden-onset events.[54] Agricultural drought is the result of a combination of rainfall deficit (meteorological drought), soil-water deficit and a reduction in the level of groundwater or stored water needed for irrigation (hydrological drought).[55] In addition to crop production, drought also affects forestry, livestock and ecosystems, with widespread consequences for agricultural systems and human health.

In the cultivated areas of Mesoamerica and South America, rainfall levels during 2015–2016 were below normal. In these subregions the livelihoods of millions of families of smallholder farmers, pastoralists and agropastoral producers depend on rainfall.[56] During 2022, prolonged drought conditions contributed to negative effects on several economic sectors in the region, such as agriculture, energy, transportation and water supply. In Brazil, the agricultural production index fell 5.2 percent in the first quarter of 2022, compared to the same period in 2021, due to a decrease in soybean and corn production.[57]

In recent years, precipitation data shows positive and negative anomalies compared to the historical average (FIGURE 25). In some areas, the short-term average in recent years is more than 600 mm/year lower than the long-term average. The areas near the Amazon are among those with the greatest negative difference. In contrast, in the period from 2016 to 2022, excessive rainfall was observed across almost all of Guyana.

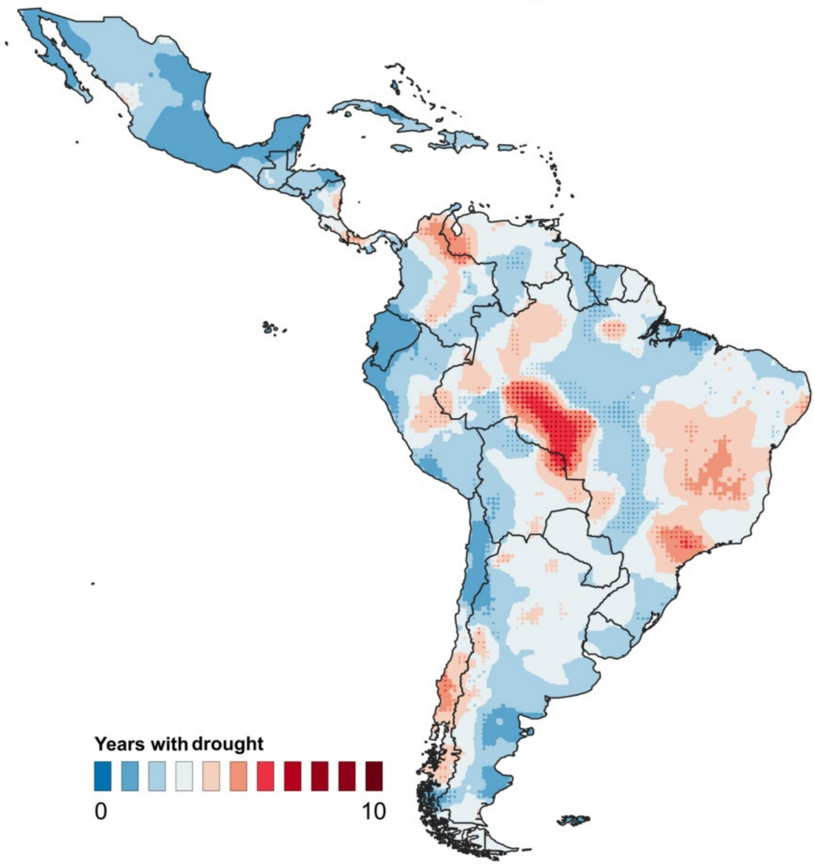
FIGURE 25
Percentage changes in average annual total precipitation in 2012–2022 compared to the historical average during 1960–2022



Notes: The map shows percentage changes in the average annual total precipitation for the period of 2012–2022 compared to the historical average (1960–2022). Changes were calculated from interpolated grid data using inverse distance weighting. Refer to the disclaimer page for the names and boundaries used in this map.
Source: Author's own elaboration based on data from Climate Research Unit. n.d. University of East Anglia. [Accessed August 10 2024]. https://www.uea.ac.uk/web/groups-and-centres/climatic-research-unit/data

In addition to greater variation in precipitation patterns, some areas have experienced multiple years of severe drought over the past decade (FIGURE 26). These prolonged dry conditions can cause other adverse situations such as wildfires, which were observed in countries like Argentina and Paraguay in 2022.[58] A drought is considered severe when the total annual precipitation is less than 1 standard deviation from the historical mean. In this situation, the consequences can last for a long period of time. In Latin America and the Caribbean, some areas have experienced more than five years of anomalous drought during the period 2012–2022. Such a situation can lead to severe water shortages, economic instability, and increased conflict over limited resources. The Dry Corridor was strongly affected by drought induced by the El Niño phenomenon between May and August 2023. This poses important challenges for agriculture, especially for the various crops that are grown in this season, the loss of which can increase acute food insecurity in the region (BOX 3).[59]

FIGURE 26
Drought during the period 2012–2022



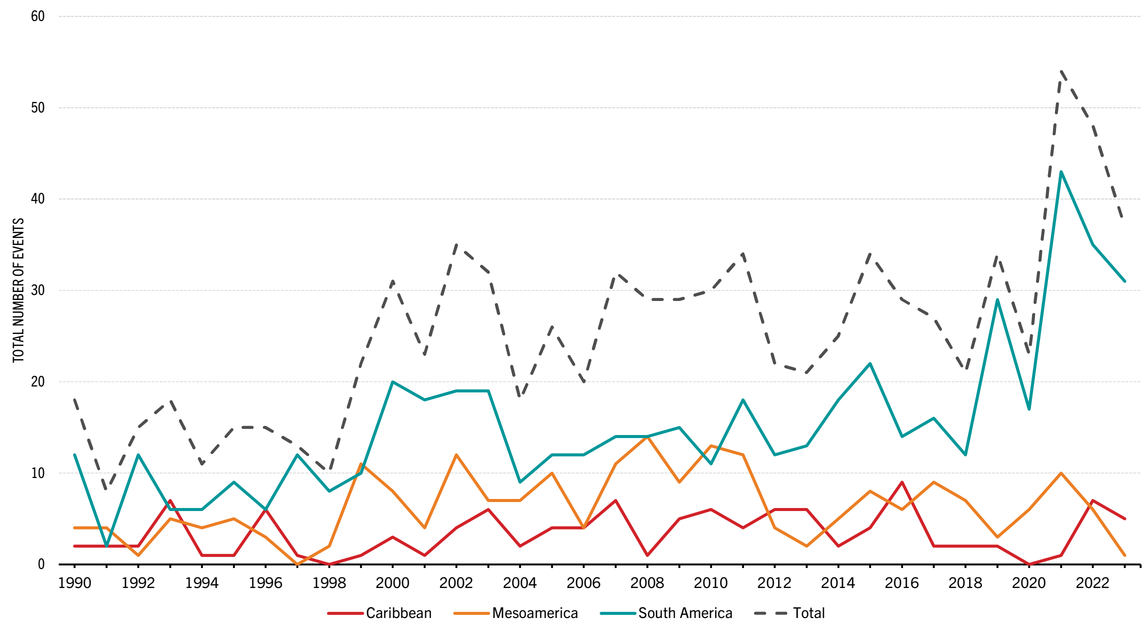
Notes: The map shows the number of years in which an area has had total annual precipitation less than 1 standard deviation from the historical mean (1960–2022). The number of years has been calculated from interpolated grid data using inverse distance weighting. Refer to the disclaimer page for the names and boundaries used in this map.
Source: Author's own elaboration based on data from Climate Research Unit. n.d. University of East Anglia. [Accessed August 10 2024]. https://www.uea.ac.uk/web/groups-and-centres/climatic-research-unit/data

Flooding and storms

Heavy rainfall and flooding can have both positive and negative impacts on the productivity of agrifood systems. For example, heavy rains and flooding of fields can delay spring planting, while causing soil compaction, oxygen starvation and root disease. Flooding can be caused by tropical storms, as happened with hurricanes Fiona, Lisa and Ian, which caused severe damage in Mesoamerica and the Caribbean.[60]

In the Caribbean, the average number of flood-related disasters per year in the period from 1990 to 2000 was 2.4, while from 2013 to 2023 it increased significantly to an average of 3.6. This represents an increase of 53.8 percent. Comparing the same periods, in Mesoamerica the average number of flood-related events rose from 4.3 to 5.7 disasters per year, representing an increase of 34 percent. The most drastic change is observed in South America where the average number of disasters related to floods went from 9.4 to 22.7 events per year, representing an increase of 142.7 percent.

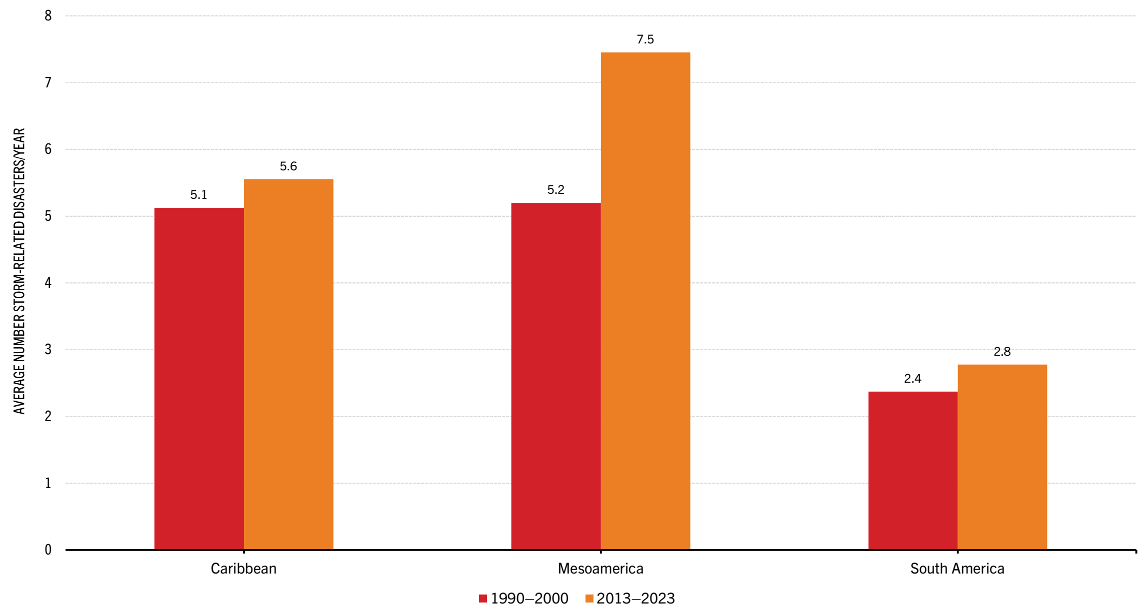
FIGURE 27
Flood-related disasters in Latin America and the Caribbean, 1990–2023



Note: Total number of flood-related disasters in Latin America and the Caribbean by subregion during the period 1990–2023. Disasters are defined as medium- and large-scale disasters that exceed established thresholds for registration in the international disaster database EM-DAT.
Source: Author's own elaboration based on EM-DAT & CRED/UCLouvain. EM-DAT. [Accessed August 10 2024]. www.emdat.be

Regarding storm-related disasters, all three subregions experienced an increase in the average number of such events when comparing the period before 2001 with 2013 onwards (FIGURE 28). Comparing 1990–2000 with 2013–2023, the largest relative increase occurred in Mesoamerica, where the number of storm-related disasters rose from 5.1 to 7.8 per year (52.6 percent increase). Sequentially, the South American average jumped from 2.3 to 2.7 disasters per year (19.3 percent) and the Caribbean average increased from 5.1 to 5.6 disasters per year (8.4 percent).

FIGURE 28
Average number of storm-related disasters in Latin America and the Caribbean by subregion



Note: Average number of storm-related disasters in Latin America and the Caribbean by subregion during the periods 1990–2000 and 2013–2023. Disasters are defined as medium- and large-scale disasters that exceed established thresholds for registration in the international disaster database EM-DAT.
Source: Author's own elaboration based on EM-DAT & CRED/UCLouvain. EM-DAT. [Accessed August 10 2024]. www.emdat.be

CHAPTER 6
CLIMATE VARIABILITY AND EXTREMES AND THE DIMENSIONS OF FOOD SECURITY

Key messages

- The exposure to climate extremes in the region is on the rise. The proportion of countries exposed to three or four different types of climate extremes rose from 11 percent in the period 2003–2007 to 44 percent during 2018–2022. Of the countries analysed, 20 have a high exposure to climate extremes and 14 have climate related vulnerability.
- In countries of the region affected only by climate extremes —and no by other factors— the prevalence of undernourishment increased by 0.8 percentage point on average between 2019 and 2023, but when combined with economic downturns and conflict the average rose to 9.2 percentage points.
- The evolving patterns of climate variability and extremes are one of the major drivers of recent food insecurity and malnutrition trends.
- The effects that climate variability and extremes may have on food availability are related to decreases in productivity and general production levels, which means countries must develop coping strategies to be able to maintain levels of food supply without major disruptions.
- Regarding access, the effects that climate extremes may have on food production could lead to an increase in food prices, affecting the purchasing power of households and reducing their access to food. In addition, those people whose livelihoods are affected by extreme climate events may also experience a reduction in their purchasing power due to a decrease in their income. In both cases, people may change their dietary patterns and the quantity and quality of the food they consume, moving from the consumption of nutritious food to highly processed foods, thereby affecting their food security and nutrition.
- Regarding food utilization, climate extremes could impact this dimension in different ways. Human health and nutritional status could be affected due to food insecurity and lower nutritional quality and safety of the food consumed, with repercussions on metabolism and energy expenditure. For example, people may have irregular eating patterns and poor diet quality, and food safety is compromised by contaminated food, vectors or water. Metabolism and energy intake are also affected by changes in lifestyle and well-being due to weather conditions.

The previous section shows the increase in frequency and intensity of climate variability and extremes, exploring the occurrence of the different types of events affecting the region. This section will show the associations between these events and food security and nutrition in Latin America and the Caribbean.

According to FAO's analysis in The State of Food Security and Nutrition in the World 2018, and the following editions in 2021 and 2024, globally, climate variability and extremes together represent one of the major drivers of recent food insecurity and malnutrition trends. Besides climate variability and extremes, the report identified economic slowdowns and downturns, as well as conflict as major drivers of hunger, food insecurity and malnutrition, along with the underlying structural factors such as the lack of access to and unaffordability of healthy diets, unhealthy food environments, and high and persistent inequality (FIGURE 38).

The accelerated warming of the globe significantly impacts ecosystems, intensifies climate variability and disrupts climatic conditions, resulting in more frequent extreme climate events and altered precipitation patterns, leading to increased occurrences of floods and droughts. Therefore, climate variability, extreme weather events and El Niño are intrinsically connected. El Niño is an important driver of natural climate variability, and in turn, triggers extreme climate events in various parts of the world.

Extreme climate events can cause acute food insecurity to a degree that can be identified by the need for emergency humanitarian aid or increases in the prevalence of acute food insecurity. Acute food insecurity refers to a short-term (possibly temporary) inability to meet dietary energy needs, related to sporadic crises that can sometimes be prolonged and are of a severity that threatens lives or livelihoods (BOX 3). In recent years, some countries in Mesoamerica and the Caribbean have required emergency humanitarian assistance on a recurring basis to safeguard their populations and preserve their livelihoods due to multiple underlying factors, including food insecurity and malnutrition, that are occurring at the same time.

TABLE 15 shows some examples of countries that have been affected by different types of climate extremes in the three subregions of Latin America and the Caribbean and, if information is available, the number of people affected by acute food insecurity, according to phases 3 and 4 of the Integrated Food Security Phase Classification and Cadre Harmonisé (IPC/CH) classification.[c]

[c] The Integrated Food Security Phase Classification (ICF) system has five levels or phases of acute food insecurity: 1) minimal/none; 2) stressed; 3) crisis; 4) emergency; and 5) catastrophe/famine. This analysis considers phases 3 and above.

BOX 3

INTEGRATED FOOD SECURITY PHASE CLASSIFICATION OF ACUTE FOOD INSECURITY

For the Integrated Food Security Phase Classification (IPC), acute food insecurity[61] is defined as any manifestation of food insecurity found in a certain area, at a specific point in time, of a severity that threatens lives or livelihoods, or both, regardless of the causes, context or duration. It is highly susceptible to change and can occur and manifest in a population within a short period of time as a result of sudden changes or shocks that negatively impact the determinants of food insecurity.

For each country, rough estimates of the number of people facing critical levels of acute food insecurity are presented that refer to the specific populations covered by the analysis, and not necessarily to the entire population at the national level.[62] The IPC system has five levels of acute food insecurity: 1) minimal/none; 2) stressed; 3) crisis; 4) emergency; and 5) catastrophe/famine.[63]

Examples of key drivers of acute food insecurity include:

- erratic rainfall and heavy reliance on rainfed agriculture;
- poverty and lack of livelihood assets;
- conflict, displacement and destruction of the means of livelihood;
- recurrent shocks, such as drought or flooding, or underlying conditions, such as poor soil fertility and high disease burden;
- civil instability, poor access to markets, economic downward trend and high dependency on markets and imports; and
- inadequate services, such as access to credit, quality education, health care or extension services.

The acute food insecurity classification focuses on identifying food insecurity of a severity that requires urgent action with short-term objectives to protect or save lives and livelihoods.

According to the Global Report on Food Crises 2024, climate extremes were a more prominent driver of acute food insecurity in 2023 compared to 2022 due to the El Niño phenomenon, with erratic and reduced rainfall across the region (BOX 4 shows past impacts on food insecurity in the Dry Corridor). In 2023, Colombia, El Salvador, the Dominican Republic, Guatemala, Haiti and Honduras were affected by flooding, storms, drought and landslides, which are drivers that contribute to food insecurity.[64] Combined, these countries reported that almost 15.8 million people suffered from acute food insecurity at the crisis level or worse[65,d] and needed urgent humanitarian assistance. Also, in Ecuador and Peru, 1.1 million migrants and refugees suffered from acute food insecurity driven by extreme weather events and difficulties accessing formal employment (TABLE 15).[66]

TABLE 15
Climate extremes by country and type in Latin America and the Caribbean and acute food insecurity in countries by subregion, 2023

Subregions	Climate shocks	Countries affected by climate shocks	Number of people (millions)		
			IPC/CH Phase 3 (Crisis)	IPC/CH Phase 4 (Emergency)	Acute food insecurity (WFP)*
Caribbean	Floods	Haiti	3.1	1.8	
	Floods and other climate shocks	Dominican Republic	1.5	0.1	
Mesoamerica	Storm	El Salvador	0.8	0.1	
	Drought and other climate shocks	Honduras	2.1	0.4	
	Floods and other climate shocks	Guatemala	3.7	0.6	
South America	Floods and other climate shocks	Colombia			1.6
		Peru			0.8
		Ecuador			0.3
			11.2	**3**	**2.7**
				16.9	

Notes: This table is elaborated based on the Global Report on Food Crises 2024. The table shows the number of people who are food insecure classified according to the Integrated Food Security Phase Classification (IPC), the Cadre Harmonisé (CH) and the World Food Programme (WFP), and it highlights the occurrence of specific climate shocks (drought, flooding, cyclones and landslides), which are drivers contributing to food insecurity. *The data for acute food insecurity (WFP) is not disaggregated in Phases 3 or 4.
Source: Author's own elaboration based on data from GNAFC (Global Network Against Food Crises) and FSIN (Food Security Information Network). 2024. 2024 Global Report on Food Crises. In: FSIN. [Accessed August 10 2024]. www.fsinplatform.org/grfc2024; and EM-DAT, CRED & UC Louvain. EM-DAT. [Accessed August 10 2024]. www.emdat.be

[d] Phase 3 and above of the Integrated Food Security Phase Classification (IPC) or equivalent situations. The estimates indicated for the population referring to a situation of crisis-level food insecurity come from a selection of countries or population groups affected by very severe and intense acute food insecurity in the peak period of 2023 defined in the Global Report on Food Crises 2024. The main source of information is the IPC or the Cadre Harmonisé (CH), including countries with population sectors in Phase 4 (Emergency) or Phase 5 (Catastrophe) of the IPC/CH; countries with at least 1 million people in IPC/CH Phase 3 (Crisis); and countries for which the Inter-Agency Standing Committee has declared a system-wide emergency response. This data implies emergency-level food insecurity that requires the immediate adoption of humanitarian measures. This is distinguished from the prevalence estimates of undernourishment presented in previous sections that are more comprehensive at the regional level and measure chronic food deprivation.

BOX 4
SPOTLIGHT: ARID FUTURES

Central America's Dry Corridor, which extends from southern Mexico to Panama, comprising parts of Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica and Panama, is vulnerable to climate-related disasters due to its geography, frequent climatic extremes, and socioeconomic and institutional weaknesses. Livelihoods are very climate sensitive as more than 1 million families rely on subsistence farming. It is estimated that even the most optimistic climate scenario could reduce yields of maize and bean crops in the region by 20 percent by the end of the century.[67]

At the same time, most countries in the Dry Corridor have high exposure to nutritional threats, and low capacity to respond to such threats, suggesting that there are no safety nets in place for children as food insecurity worsens.[68] For example, Honduras and Guatemala demonstrate a very high risk of deteriorating population nutrition status in an emergency. In this context, children's food security is expected to decline.

Past events provide insight into the potential impacts of climate-induced food insecurity. In 2009, for example, 2.5 million Guatemalans were affected by severe drought, which resulted in immense economic and social hardship: 400 000 families were affected, 30 percent of all pregnant women were malnourished and 25 children died because of the event.[69]

In addition, as the climate changes and such events become more common and more severe, livelihoods and food insecurity may become a more important driver for children and their families to migrate. Faced with an uncertain future, many of the region's families and children have already migrated driven by hunger and in search of a better future. Moreover, 15 percent of those surveyed by the World Food Programme (WFP) reported that they were making concrete plans to migrate.[70]

6.1. CLIMATE VARIABILITY AND EXTREMES ARE A THREAT TO FOOD SECURITY AND NUTRITION

Food security and nutrition is threatened by climate variability and extremes. Extreme events disrupt food security and nutrition in a more immediate manner, but slow onsets can also cause long-term disruptions. The extent to which climate variability and extremes negatively affect people's food security and nutrition status depends on their degree of exposure (the frequency or intensity of climate extremes), and their vulnerability to climate shocks and stress. There are some countries in the region that are more exposed and more vulnerable to extreme climate events, meaning that their food security and nutrition is more threatened than that of other countries with greater effects on their food security and nutrition.

High exposure to extreme climate events

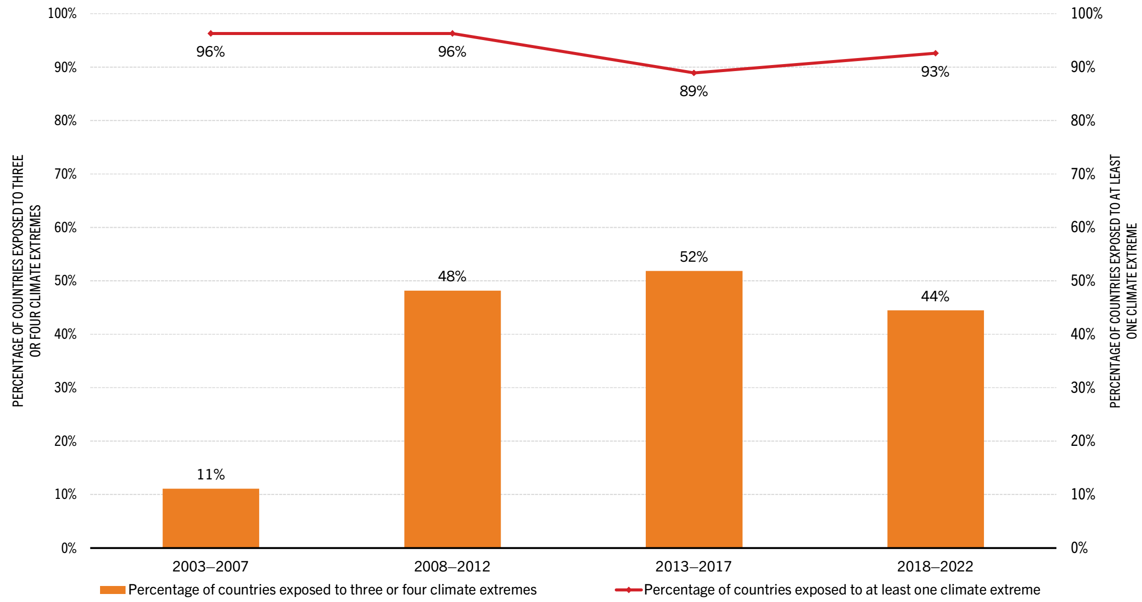
Exposure is related to people, livelihoods, species or ecosystems, environmental services and resources, infrastructure, and economic, social or cultural assets in places and environments located in hazard-prone areas that could be negatively affected.[71,72] Based on the analysis carried out in *The State of Food Security and Nutrition in the World 2018*,[e] the frequency (number of years of exposure in a five-year period) and intensity (various types of extreme climate events over a five-year period) were taken into account to determine the exposure of countries to extreme climate events in areas that could be most negatively affected. For the purposes of this analysis, high-exposure countries are those that experienced three or four different types of extreme climate events during the two subperiods 2013–2017 and 2018–2022 or, alternatively, where climate extremes occurred during at least seven years in the period 2013–2022.

Globally, the number of low- and middle-income countries exposed to three or four types of extreme climate events (heat waves, drought, flooding or storms) doubled between the periods 2003–2007 and 2018–2022.[73] The intensity of extreme climate events in the region has also increased, with the percentage of countries exposed to three or four different types of climate extremes rising from 11 percent (three countries) in the period 2003–2007 to 44 percent (12 countries) in 2018–2022 (FIGURE 29).

[e] See Annex 2 of 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. www.fao.org/3/I9553EN/i9553en.pdf; 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; or FAO, IFAD, UNICEF, WFP & WHO. 2024. The State of Food Security and Nutrition in the World 2024 – Financing to end hunger, food insecurity and malnutrition in all its forms. Rome, FAO. https://doi.org/10.4060/cd1254en according to updates.

FIGURE 29

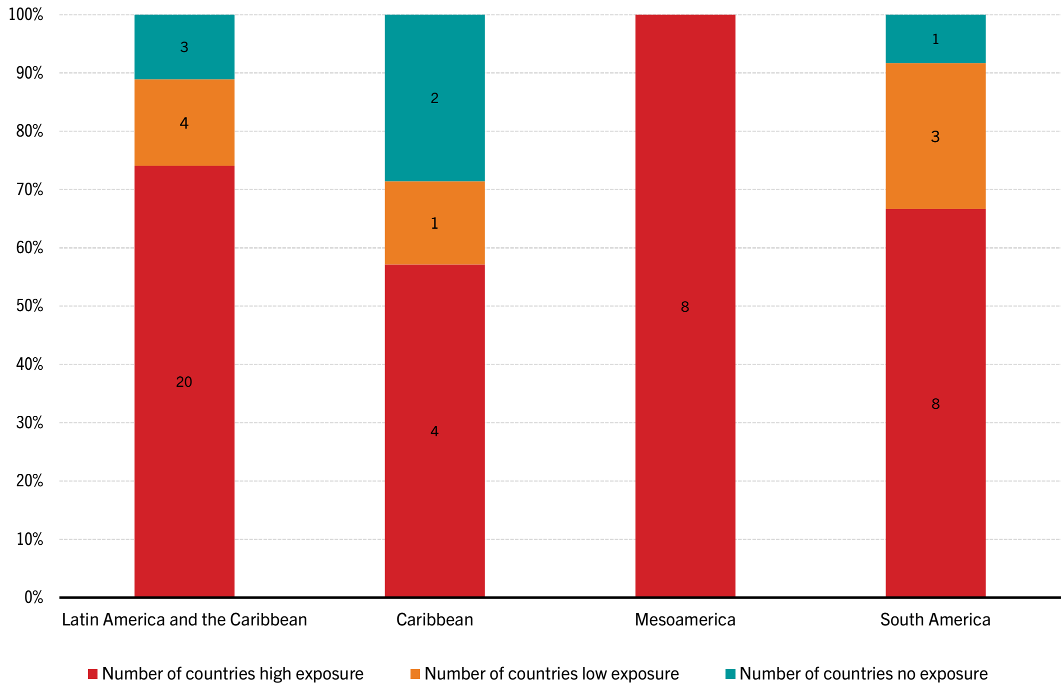
Frequency and intensity of extreme climate events in Latin America and the Caribbean



Note: The definition of high exposure to climate extremes follows the methodology adopted in The State of Food Security and Nutrition in the World 2024. See supplementary materials to chapter 3 of The State of Food Security and Nutrition in the World 2024 for details.
Sources: Authors' own elaboration based on FAO. 2024. FAOSTAT: Food security indicator set. [Accessed July 24 2024]. https://www.fao.org/faostat/en/#data/FS. License: CC-BY-4.0 (for prevalence of undernourishment); and World Bank. 2022. World Bank: World development indicators. [Accessed October 31 2023]. https://datatopics.worldbank.org/world-development-indicators (for data relating to country groupings by income level).

Of the countries analysed in the region, 20 show high exposure to climate extremes. Regarding the subregions, FIGURE 30 shows that all countries in Mesoamerica have high exposure to climate extremes, while in South America and the Caribbean the percentage of countries in this position is 67 and 57 percent, respectively.

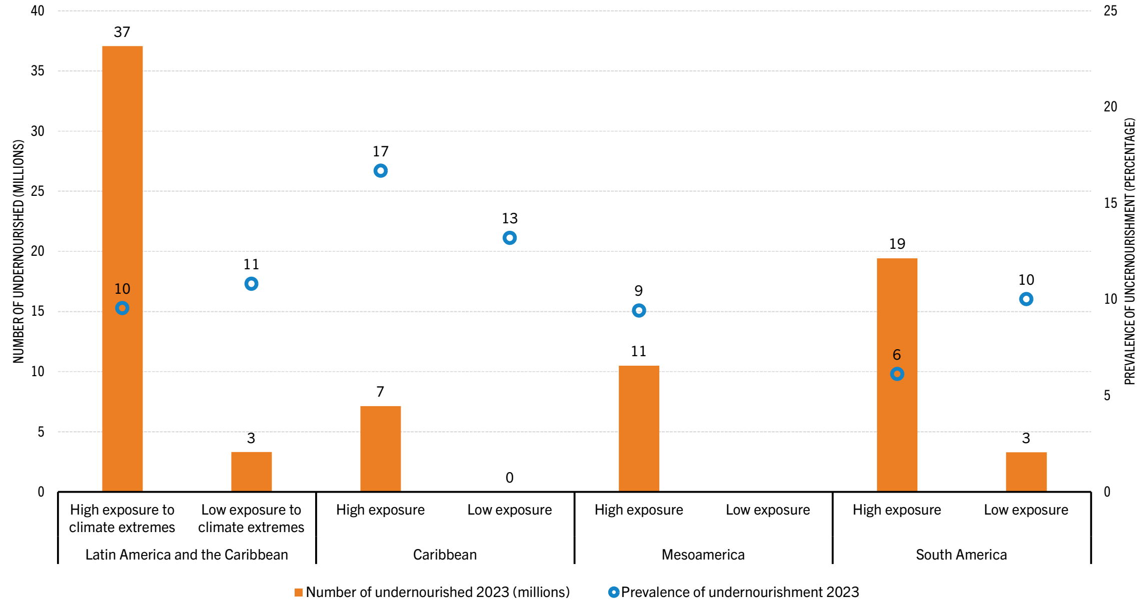
FIGURE 30
Number of countries in Latin America and the Caribbean
with different levels of exposure to climate extremes by subregion for the period 2013–2022



Notes: The number inside the bar refers to the Number of countries with high exposure is defined as countries and territories exposed to climate extremes for up to 50 percent of the time, or less than four out of six years during the most recent subperiod of six consecutive years. The definition of high exposure to climate extremes follows the methodology adopted in The State of Food Security and Nutrition in the World 2024. See supplementary materials to chapter 3 of The State of Food Security and Nutrition in the World 2024 for details.
Sources: Authors' own elaboration based on FAO. 2024. FAOSTAT: Food security indicator set. [Accessed July 24 2024]. https://www.fao.org/faostat/en/#data/FS. License: CC-BY-4.0 (for prevalence of undernourishment); and World Bank. 2022. World Bank: World development indicators. [Accessed October 31, 2023]. https://datatopics.worldbank.org/world-development-indicators (for data relating to country groupings by income level).

FIGURE 31 shows that, although the prevalence of undernourishment could be higher in countries with low exposure, the number of people affected by hunger in the region and subregions is much higher in countries with high exposure. In Latin America and the Caribbean, 37 million people in countries with high exposure suffer from hunger compared to 3 million in countries with low exposure.

FIGURE 31
Undernourishment in countries with high and low exposure to climate extremes in Latin America and the Caribbean and by subregion for the period 2013–2022



Note: The definition of high exposure to climate extremes follows the methodology adopted in The State of Food Security and Nutrition in the World 2024. See supplementary materials to chapter 3 of The State of Food Security and Nutrition in the World 2024 for details.
Sources: Authors' own elaboration based on FAO. 2024. FAOSTAT: Food security indicator set. [Accessed July 242024]. https://www.fao.org/faostat/en/#data/FS. License: CC-BY-4.0 (for prevalence of undernourishment); and World Bank. 2022. World Bank: World development indicators.
[Accessed October 31 2023]. https://datatopics.worldbank.org/world-development-indicators (for data relating to country groupings by income level).

Vulnerability to food security in the face of climate extremes

Vulnerability to food insecurity, in this case, is related to a series of conditions that increase the susceptibility of a household to the effects of extreme climate events on food security.[74] A country is considered to have climate-related vulnerability if one of the following conditions exists: a country shows a statistically significant association between the production or import of cereals and at least one climate factor (temperature, precipitation, Anomaly Hot Spots of Agriculture Production system or Agricultural Stress Index System) during the 2003–2022 period (climate-related production); a country depends largely on agriculture, meaning that 60 percent or more of the population is employed within the agriculture sector in 2022, or the country shows a significant increase in the prevalence of undernourishment related to a severe drought alert during the 2003–2022 period (vulnerability to severe drought).

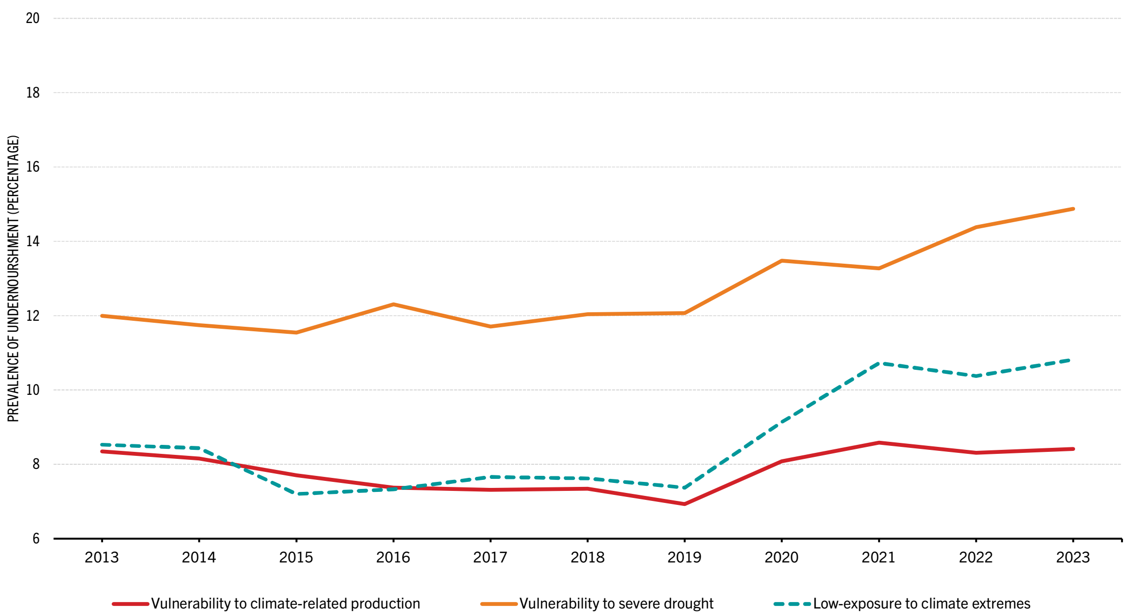
Among the countries in the region analysed, 14 have climate related vulnerability, and among those 12 countries have vulnerability to climate-related production or imports, six have vulnerability to severe drought, and two have both vulnerabilities.[f] FIGURE 32.A shows that countries in the region that are vulnerable to severe drought also have a higher prevalence of undernourishment, which is significantly more than countries

[f] No country in the region shows vulnerability due to being largely dependent on agriculture

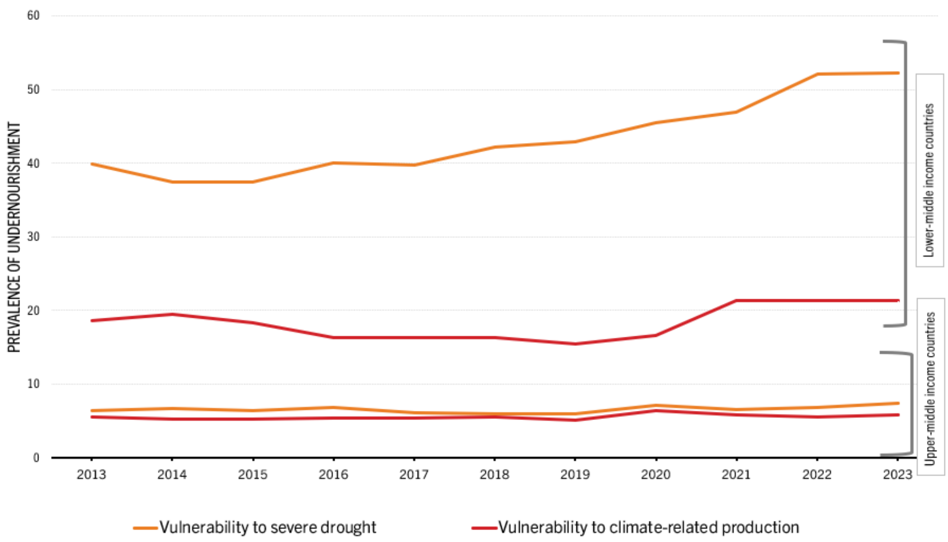
with vulnerability to climate-related production. But a separate analysis by income level, or by subregion, shows important differences. Lower-middle-income countries with vulnerability to climate-related production and severe drought have a higher prevalence of undernourishment than upper-middle-income countries in the region with the same vulnerabilities. And, specifically in lower-middle-income countries with high vulnerability to drought, the prevalence of undernourishment has increased since 2015 (FIGURE 32.B). Additionally, while in the Caribbean and South America the prevalence of undernourishment is higher in countries vulnerable to drought, in Mesoamerica the prevalence of undernourishment is higher for those countries with vulnerability to climate-related production (FIGURE 32.C).

FIGURE 32
Evolution of undernourishment in countries in Latin America and the Caribbean

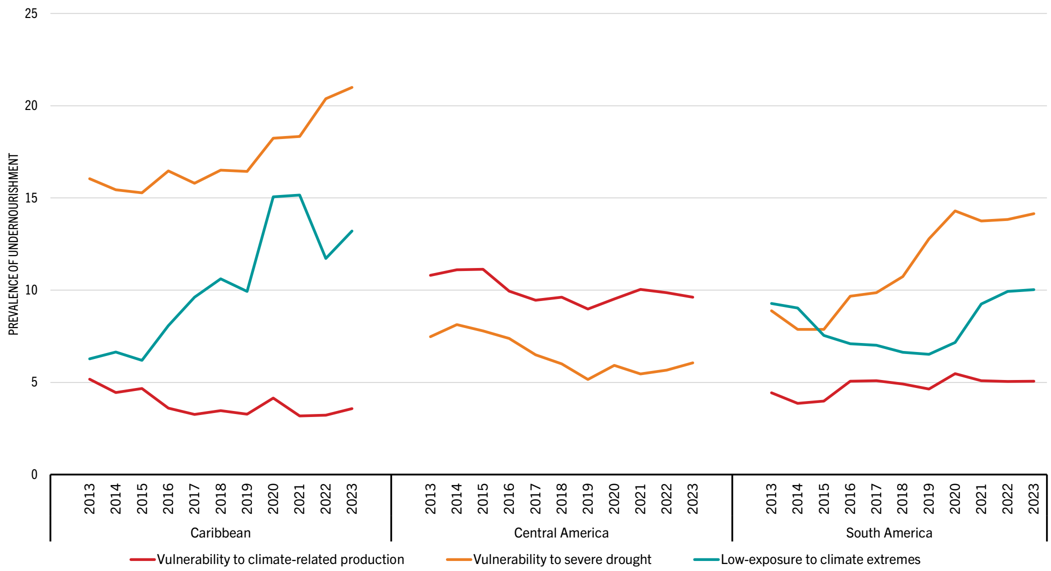
A) Evolution of undernourishment in countries in Latin America and the Caribbean with vulnerability to severe drought and climate-related production



B) Evolution of undernourishment by country income group classification



C) Evolution of undernourishment by subregion



Note: The definition of climate related vulnerability follows the methodology adopted in The State of Food Security and Nutrition in the World 2024. See supplementary materials to chapter 3 of The State of Food Security and Nutrition in the World 2024 for details.
Sources: Authors' own elaboration based on FAO. 2024. FAOSTAT: Food security indicator set. [Accessed July 24 2024]. https://www.fao.org/faostat/en/#data/FS. License: CC-BY-4.0 (for prevalence of undernourishment); and World Bank. 2022. World Bank: World development indicators. [Accessed October 31 2023]. https://datatopics.worldbank.org/world-development-indicators (for data relating to country groupings by income level)

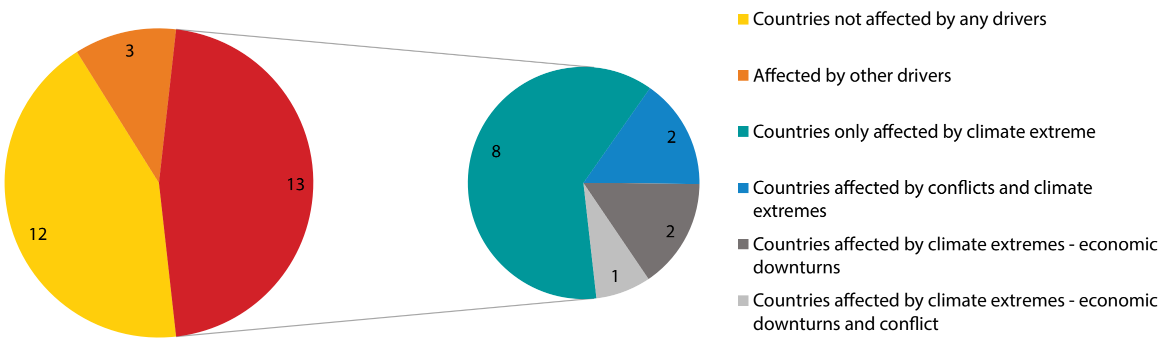
High exposure and vulnerability to extremes increase the risk of hunger

The combination of both high exposure and climate-related vulnerability put countries at greater risk of hunger in the face of extreme climate events. A country is considered affected if it experiences a combination of high exposure to climate extremes (i.e. drought, flooding, heat spells and storms) and vulnerability to climate factors.

As shown in *The State of Food Security and Nutrition in the World 2024*, the region is not only affected by climate variability and extremes, but also by the other three drivers. FIGURE 33 shows that, of the 13 countries affected by climate extremes,[g] eight countries are affected by climate extremes alone[h] and five by climate extremes combined with other drivers.

Furthermore, FIGURE 34 and FIGURE 35 both show the latest estimates and the evolution of the prevalence of undernourishment in countries affected by climate extremes compared to other drivers. It is important to note that countries in Latin America and the Caribbean that are affected by climate extremes and other drivers show a higher prevalence of undernourishment than countries that are not affected by those drivers, and the gap is especially higher in countries affected by economic slowdowns and downturns.

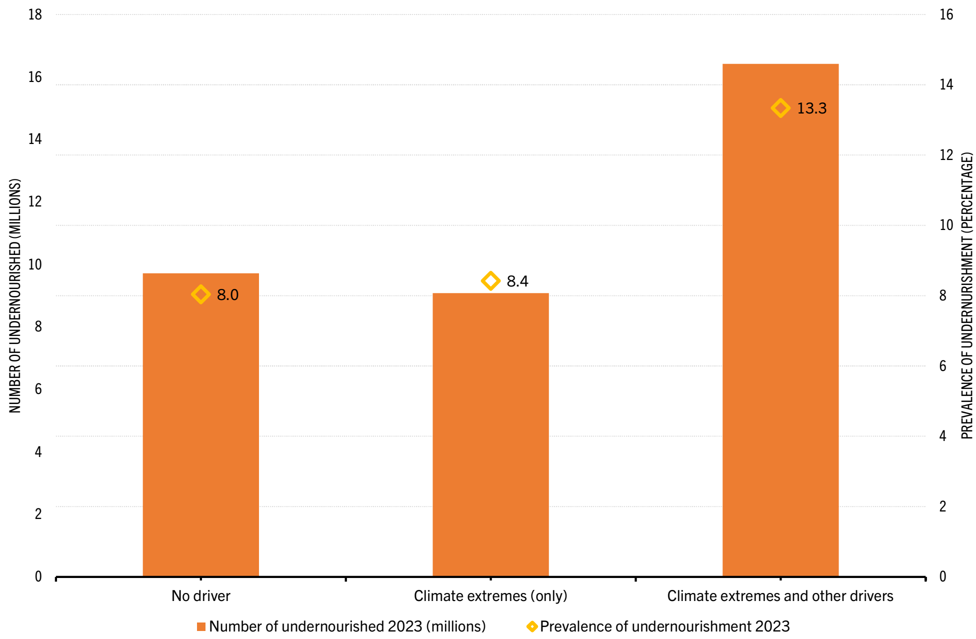
FIGURE 33
Countries in Latin Americ and the Caribbean affected by extreme climate events, by subregion



Note: The definition of countries affected by climate extremes, conflict and economic downturns follows the methodology adopted in The State of Food Security and Nutrition in the World 2024. See supplementary materials to chapter 3 of The State of Food Security and Nutrition in the World 2024 for details.
Sources: Authors' own elaboration based on FAO. 2024. Supplementary material to The State of Food Security and Nutrition in the World 2024. [Accessed July 24 2024] https://doi.org/10.4060/cd1254en-supplementary

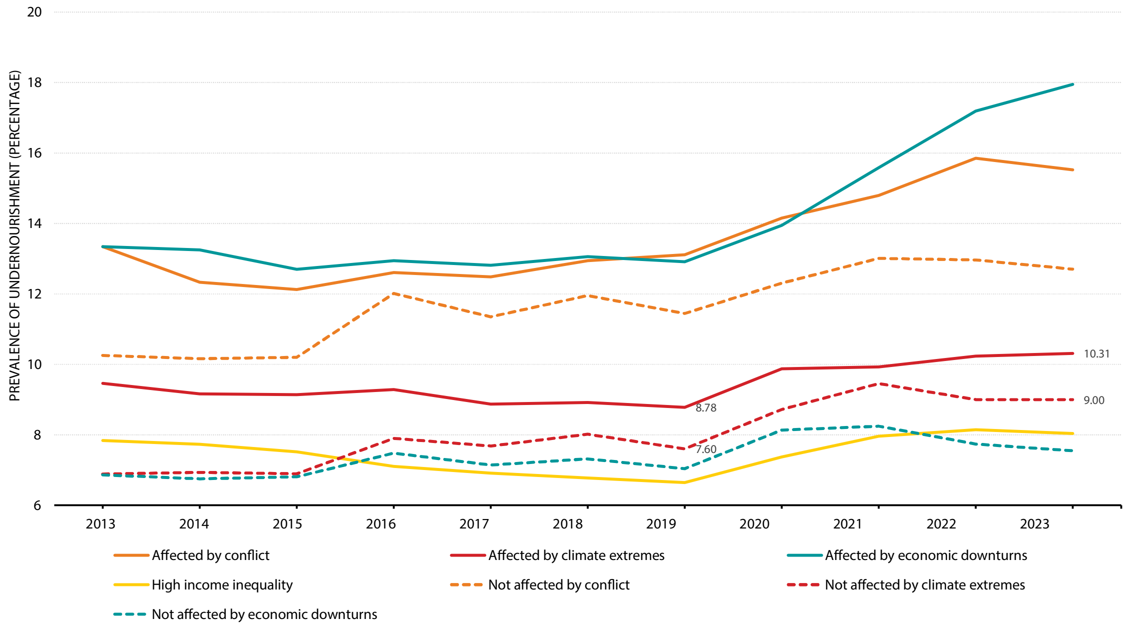
[g] The 13 countries are: Argentina, Belize, Brazil, Cuba, the Dominican Republic, El Salvador, Ecuador, Haiti, Jamaica, Mexico, Nicaragua, Panama and Peru.
[h] The countries that are only affected by climate extremes in the region are: Argentina, the Dominican Republic, Ecuador, El Salvador, Jamaica, Nicaragua, Panama and Peru.

FIGURE 34
Prevalence of undernourishment in countries affected by climate extremes



Note: The definition of countries affected by climate extremes, conflict and economic downturns follows the methodology adopted in The State of Food Security and Nutrition in the World 2024. See supplementary materials to chapter 3 of The State of Food Security and Nutrition in the World 2024 for details.
Sources: Authors' own elaboration based on FAO. 2024. FAOSTAT: Food security indicator set. [Accessed July 24 2024]. https://www.fao.org/faostat/en/#data/FS. License: CC-BY-4.0 (for prevalence of undernourishment); and World Bank. 2022. World Bank: World development indicators. [Accessed October 31 2023]. https://datatopics.worldbank.org/world-development-indicators (for data relating to country groupings by income level).

FIGURE 35
Evolution of undernourishment in countries affected and not affected by different drivers in Latin America and the Caribbean



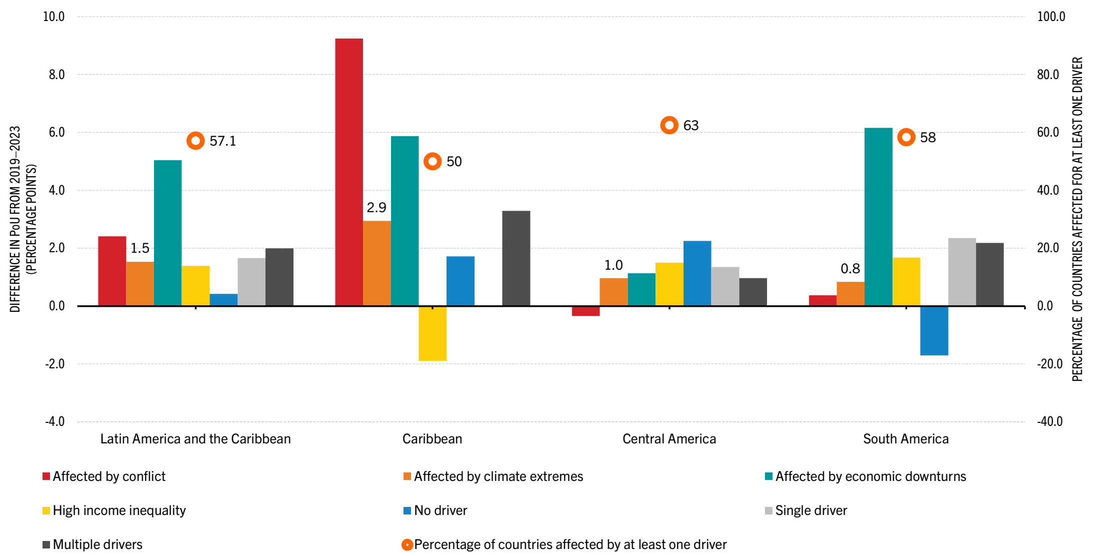
Note: The definition of countries affected by climate extremes, conflict and economic downturns follows the methodology adopted in The State of Food Security and Nutrition in the World 2024. See supplementary materials to chapter 3 of The State of Food Security and Nutrition in the World 2024 for details.
Sources: Authors' own elaboration based on FAO. 2024. FAOSTAT: Food security indicator set. [Accessed July 24 2024]. https://www.fao.org/faostat/en/#data/FS. License: CC-BY-4.0 (for prevalence of undernourishment); and World Bank. 2022. World Bank: World development indicators. [Accessed October 31 2023]. https://datatopics.worldbank.org/world-development-indicators (for data relating to country groupings by income level).

As FIGURE 36 shows, in Latin America and the Caribbean, between 2019 and 2023, an increase of 1.5 percentage points was observed in the prevalence of undernourishment in all countries affected by climate extremes, regardless of whether or not they are affected by other factors. By subregion, in the Caribbean the rise in the prevalence of this condition was almost 3 percentage points, in Mesoamerica it was 1 percentage point and in South America it was 0.8 percentage point.

When countries affected by climate extremes are also affected by other drivers, a major increase is observed in the prevalence of undernourishment. FIGURE 37 shows that in countries only affected by climate extremes that is, not affected by other factors, the prevalence of undernourishment increased by 0.8 percentage point between 2019 and 2023, but when combined with economic downturns the increase was 1.8 percentage points, and the countries affected by a combination of climate extremes, economic downturns and conflict show an increase of 9.2 percentage points.

FIGURE 36

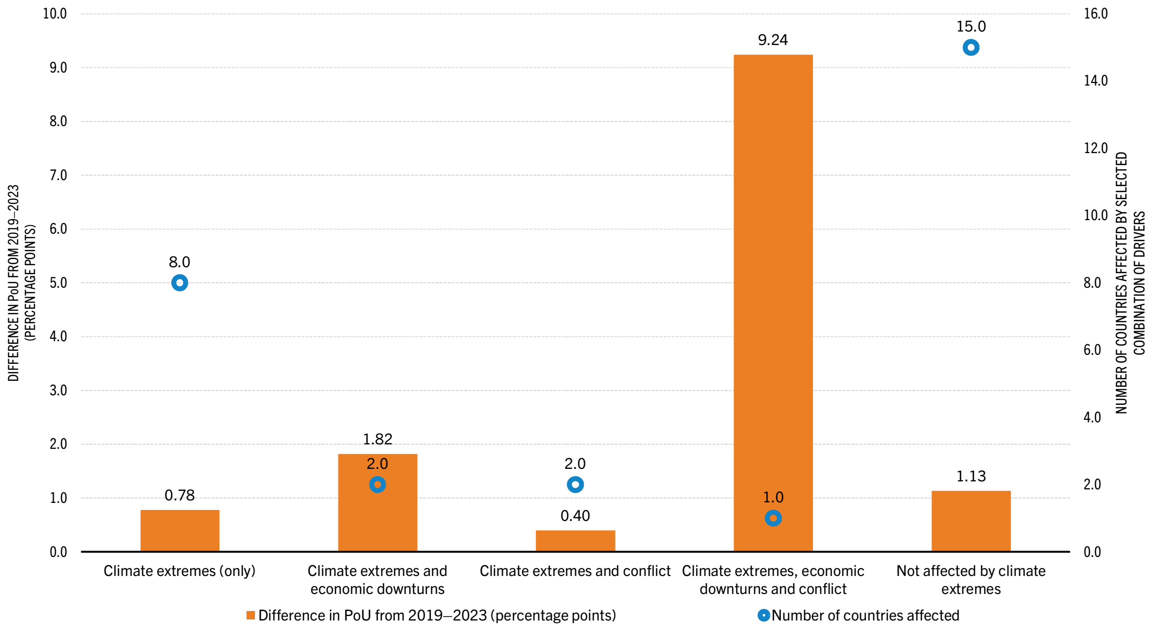
Average increase of undernourishment between 2019 and 2023
in countries affected by major drivers in Latin America and the Caribbean and by subregion



Note: The definition of countries affected by climate extremes, conflict and economic downturns follows the methodology adopted in The State of Food Security and Nutrition in the World 2024. See supplementary materials to chapter 3 of The State of Food Security and Nutrition in the World 2024 by details.
Sources: Authors' own elaboration based on FAO. 2024. FAOSTAT: Food security indicator set. [Accessed July 24 2024].
https://www.fao.org/faostat/en/#data/FS. License: CC-BY-4.0 (for prevalence of undernourishment); and World Bank. 2022. World Bank: World development indicators.
[Accessed October 31 2023]. https://datatopics.worldbank.org/world-development-indicators (for data relating to country groupings by income level).

FIGURE 37

Average increase in the prevalence of undernourishment between 2019 and 2023 in countries in Latin America and the Caribbean affected by climate extremes and combined with other drivers



Notes: The definition of countries affected by climate extremes, conflict and economic downturns follows the methodology adopted in The State of Food Security and Nutrition in the World 2024. See supplementary materials to chapter 3 of The State of Food Security and Nutrition in the World 2024 for details. PoU = prevalence of undernourishment.

Sources: Authors' own elaboration based on FAO. 2024. FAOSTAT: Food security indicator set. [Accessed July 242024]. https://www.fao.org/faostat/en/#data/FS. License: CC-BY-4.0 (for prevalence of undernourishment); and World Bank. 2022. World Bank: World development indicators. [Accessed October 31 2023]. https://datatopics.worldbank.org/world-development-indicators (for data relating to country groupings by income level).

6.2. THE MAIN POSSIBLE EFFECTS OF CLIMATE VARIABILITY AND EXTREMES THROUGHOUT AGRIFOOD SYSTEMS

Agrifood systems are the foundation of food security and nutrition. The way food is produced, processed, distributed and consumed directly affects the availability, access, utilization and stability of food, influencing the overall nutrition and well-being of populations. FIGURE 38 summarizes the main possible effects of climate variability and extremes throughout agrifood systems (including food supply chains, consumer behaviour and diets, and food environments), which impact the four dimensions of food security and nutrition in different but related ways.

The dimensions of food security are defined as follows: availability establishes whether food is actually or potentially physically available and also addresses aspects of production, food reserves, markets and transportation; access relates to whether food is actually or potentially present in physical form and whether households and individuals have both physical and economic access to it; utilization has to do with sufficient energy and nutrient intake by individuals as a result of good care and feeding practices, water and sanitation, food preparation, food heritage, dietary diversity, intra-household distribution of food and good biological utilization of food consumed, which determines people's nutritional status; and, finally, stability refers to the stability of the entire agrifood system in order to guarantee people's food security at all times.[75, 76]

Availability may be affected because climate variability and extremes can cause a reduction in agricultural production due to decreased yields or losses in crops, livestock or fishing. Furthermore, if natural resources are impacted, which are key for food production, availability may also be affected. This may impact locally produced food, which can then lead to decreases in stock levels and lower quantities available for trade.

A reduction in subsistence livelihoods or capital assets weakens the adaptive capacity of households and increases their vulnerability to hunger, food insecurity and malnutrition. Specifically, climate extremes may affect goods and services available to people, not only limiting their economic opportunities and livelihood options but also modifying their resilience (coping and adaptive capacities). In addition, prolonged or recurrent climate extremes lead to diminished coping capacity and loss of livelihoods, and, therefore, are a detriment to food security.[77]

The impact generated on livelihoods has a direct impact on people's incomes, which in turn affects their economic access to food and, given the lower production and supply of food, prices tend to increase, thereby reducing the purchasing power of households. Furthermore, when damage occurs to livelihoods and there is a decrease in production, there may be negative consequences for the growth of food and non-food agricultural industries, thereby impacting the economic growth of countries and increasing poverty, which also affects economic access to food and can increase undernourishment and food insecurity.[78]

The occurrence of climate extremes poses important challenges for economic and physical access to food. In terms of the physical access to food, climate extremes can generate disruptions in the supply chain, affecting various post-harvest facilities and distribution routes, while also causing accessibility problems for some localities and making it impossible for people to leave their homes to buy food and for smallholder farmers to sell their production. Therefore, regardless of the level of economic access to food, the food products do not reach households.[79] All of the above can generate an increase in food insecurity and malnutrition, which disproportionately affects groups in vulnerable situations.

In terms of utilization, climate extremes such as greater precipitation irregularity and increased temperatures can have an effect on water and sanitation, in addition to health risks that can compromise food safety. The impacts on water, sanitation and health risk patterns can generate an increase and change in the geographical distribution of foodborne diseases and affect antimicrobial resistance. Furthermore, nutrition is extremely susceptible to extreme climate events. By affecting access to food, eating patterns are altered and dietary diversity and quality of food consumed in households at lower socioeconomic levels are reduced, thereby resulting in an inadequate intake of nutrients and energy due to households opting for highly processed foods.[80] Interruptions in health services can also be generated, resulting in changes in maternal childcare, breastfeeding and violations to the International Code of Breastmilk Substitutes. Thus, the risk of malnutrition is more pronounced in pregnant women, lactating women, children and older adults.[81]

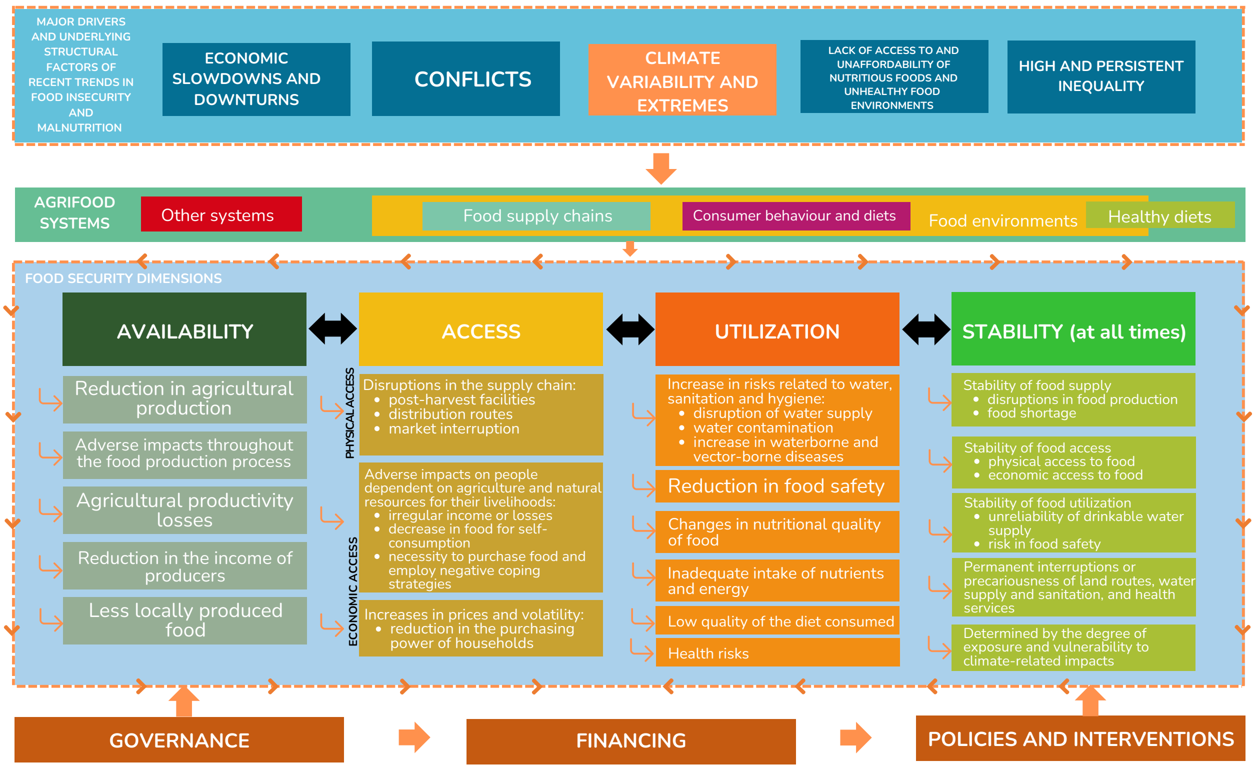
Finally, food stability involves ensuring the availability, access and utilization of food for households and individuals at all times.[82] It includes the capacity to guarantee food security in the event of sudden crises or during cyclical events.[83] Stability problems can refer to short-term instability (which can lead to acute food insecurity) or medium or long-term instability (which can lead to chronic food insecurity). Climatic, economic, social and political factors can all be a source of instability.[84] As analysed before, climate variability and extremes are a threat to food stability having effects on the other three dimensions of food security and nutrition.

As the biggest net food-exporting region in the world, the challenge that Latin America and the Caribbean faces in terms of food security and nutrition stems primarily from affordability and accessibility constraints rather than food availability. In a context of high levels of income inequality and rising food prices, which have larger impacts on people in vulnerable situations, this reduces the capacity of these groups to be able to afford nutritious foods.[85] If climate extremes are added to the equation, which also affect different subgroups of the population (women, people living in rural and peri-urban areas, and Indigenous Peoples) in a disproportionate manner, the food access of vulnerable populations could be even more at risk.

In addition, structural inequalities influence the main aspects of food security and nutrition. Typically, the effects of stresses or shocks can be amplified or reduced depending on the vulnerabilities in each component of the agrifood system. In many cases, the effects of extreme climate events can be amplified due to the limited capacity of certain population groups to cope and adapt to these situations. Therefore, impacts from climate shocks are context-specific, which means they not only depend on the nature and intensity of the shock, but also on the existing structural inequalities, whether at the community or individual level. Specifically, population groups such as family farmers and small-scale producers, populations suffering from poverty, inequality or marginalization, women, children, older adults and socially isolated people, infants and adolescent girls, Indigenous Peoples, Afro-descendants and migrants are all more vulnerable to climate variability and extremes, putting their food security and nutritional status at greater risk.[86]

FIGURE 38

Main impacts of climate variability and extremes on the dimensions of food security



Sources: Author's own elaboration based on FAO, IFAD, UNICEF, WFP & WHO. 2018. The State of Food Security and Nutrition in the World. Building climate resilience for food security and nutrition. FAO, Rome. www.fao.org/3/I9553EN/i9553en.pdf; FAO. 2015. Climate change and food security: risks and responses. Rome. http://www.fao.org/3/a-i5188e.pdf; IPCC. 2022. Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, UK and New York, USA, Cambridge University Press. https://doi.org/10.1017/9781009325844; FAO. 2016. The State of Food and Agriculture: Climate change, agriculture and food security. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/07bc7c6e-72e5-488d-b2f7-3c1499d098fb/content; and Holleman, C., Rembold, F., Crespo, O. & Conti, V. 2020. The impact of climate variability and extremes on agriculture and food security - An analysis of the evidence and case studies. Background paper for The State of Food Security and Nutrition in the World 2018. FAO Agricultural Development Economics Technical Study No. 4. Rome, FAO. https://doi.org/10.4060/cb2415en

These multidimensional challenges demand comprehensive, intersectional, rights-based and systemic approaches, considering people's livelihoods, promoting access to and consumption of healthy diets to address food insecurity and malnutrition in all their forms, and strengthening the sustainable management of agrifood systems, including resilience against climate variability and extremes.[87] These policies and interventions are explained in detail in CHAPTER 7.

Below is a detailed analysis of climate variability and extremes and the dimensions of food security and the existing structural inequalities, followed by policy recommendations and suggested actions to promote climate resilience in agrifood systems, to contribute to achieving SDG Targets 2.1 and 2.2.

6.3. CLIMATE VARIABILITY AND EXTREMES AND FOOD AVAILABILITY

Food availability is the first dimension of food security, which seeks to ensure the constant and sufficient supply of food.

Climate variability and extremes affect food production, particularly agricultural production and labour productivity.[88] Globally, 10 percent of the area currently suitable for major crops and livestock is projected to become climatically unsuitable by mid-century, and 31 to 34 percent will be climatically unsuitable by the end of the century.[89]

Studies corresponding to the period 2015–2019 show that, in the region, drought and changes in temperature have affected crops significantly. As temperatures increase, variations are observed in the growth period of the crop since the fruit goes through a more accelerated maturation process due to these high temperatures, which reduces harvest yields. This can be observed both in the region as a whole, and in all subregions for which data is available.[90]

Associations between climate variability and food availability can be seen in a recent study in Paraguay where a 1.0 percent increase in average maximum temperatures is associated with a 5.0 percent reduction in agricultural productivity, which is associated with an almost 1.0 percent reduction in calories purchased by households, one of the key elements that affects food security.[i] This study concluded that food insecurity could increase by up to 28 percentage points by 2100, especially in areas of the country experiencing high temperatures and low rainfall.[91]

The potential impacts on food availability due to climate effects extend beyond the region of Latin America and the Caribbean. Many countries within the region, particularly those in the Caribbean, rely heavily on imported food to meet their needs. This high dependence on external food sources makes these countries especially vulnerable to disruptions in global food supply chains caused by climate extremes in other regions. According to a report published in 2024 by FAO and IDB, Bahamas, Barbados, the Bolivarian Republic of Venezuela, El Salvador, Panama, Dominican

[i] This is calculated through a series of equations, which take into account calories purchased by households, agricultural productivity and the climate variables that impact this productivity. The estimate analyses the effect of climate-related variables (temperature and precipitation) on caloric consumption through their effect on household agriculture productivity.

Republic, Guyana, Haiti, Jamaica, Suriname and Trinidad and Tobago are net importers of agrifood products in the region. According to the most recent report from the WTO Committee on Agriculture, issued in 2023, 33 countries are listed as NFIDCs, of which 15 are in the Latin America and the Caribbean region: Antigua and Barbuda, Barbados, Cuba, Dominica, the Dominican Republic, El Salvador, Grenada, Honduras, Jamaica, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, and the Bolivarian Republic of Venezuela.[j,92]

Climate extremes can drastically reduce agricultural output in major food-producing regions like Northern America, Europe and Asia. When these regions experience significant crop failures or reduced yields, global food prices can spike, and the availability of food for export can decrease. Countries dependent on food imports are directly impacted by these global supply chain disruptions. For instance, a drought in the Midwest of the United States of America or a flood in Southeast Asia can lead to reduced exports of grains and rice, respectively. This can cause immediate price shocks and scarcity in countries that rely on these imports, thereby threatening food security.

Even in cases where a country is not a net food importer, dependency on imports for specific types of food can still render the country vulnerable to price shocks. For instance, the FAO Cereal Price Index has shown high volatility in recent years. Starting in 2019, the index increased by more than 80 percent in the subsequent two years, followed by a decrease of 60 percent in the following two years (2020–2021). Among all countries in the Latin America and the Caribbean region, only six were net exporters of cereals during the most recent available data period (2020–2022).[k,l]

The effects are observed throughout the food production process, from the planting of crops, which depend on the humidity of the soil and the quality of the harvest, which in turn can be affected by flooding or drought, to the storage and transportation of food. In all these processes, temperature and humidity play an important role.[93]

An analysis of the Standardized Precipitation and Evapotranspiration Index (SPEI)[m] shows that, in much of the region, the percentage of arable land affected by extreme drought has increased in recent years, which has a direct impact on crop yield losses.[94] For example, major agrifood exporters, such as Argentina and Brazil, are experiencing declining yields of crops such as corn and soybeans, in part due to changes in weather patterns. In addition, other crops such as coffee may have to be moved to higher altitudes to maintain current yields, which in turn has an impact on food access as they can be a major source of income for farmers in countries where this product is a main export, such as in Colombia and Guatemala.[95]

[j] This analysis covers only 26 countries in the region and does not include Antigua and Barbuda, Cuba, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia, and Saint Vincent and the Grenadines

[k] The cereal imports dependency ratio shows how much of the available domestic food supply of cereals has been imported and how much comes from the country's own production. It is calculated as (cereal imports – cereal exports)/ (cereal production + cereal imports – cereal exports) * 100. Given this formula, the indicator assumes only values <= 100. Negative values indicate that the country is a net exporter of cereals. See FAO. 2024. World Food Situation: FAO Food Price Index. [Accessed July 24 2024]. https://www.fao.org/worldfoodsituation/foodpricesindex/en

[l] The six countries were Argentina, Brazil, Guyana, Paraguay, Suriname and Uruguay.

[m] The Standardized Precipitation and Evapotranspiration Index (SPEI) is a drought index based on climatic data. It can be used for determining the onset, duration and magnitude of drought conditions with respect to normal conditions in a variety of natural and managed systems.

Climate is the most important determinant of agricultural yields, with variability in temperature and precipitation estimated to expand to 30 to 50 percent of global interannual change in cereal yields.[96] This explains why climate variability and extremes have such a negative impact on agricultural productivity[n] at the regional, national and subnational levels.[97]

In fact, estimates indicate that over the last 30 years globally USD 3.8 trillion associated with agricultural and livestock production has been lost due to a series of catastrophes (including a series of climate extremes),[o] which corresponds to an average loss of USD 123 billion per year, or 5.0 percent of annual global agricultural gross domestic product (GDP).[98] In South America, agricultural losses attributable to catastrophes,[p] including extreme climate events, are considerable and are estimated at values close to 10 percent of agricultural GDP[99] between 1991 and 2021.

In the Andes, residents have also experienced changes in the annual weather cycle. Data collected between 2012 and 2014 suggests that in Colomi (Plurinational State of Bolivia) crop yields were reduced, which has prompted farmers to modify the agricultural calendar, their soil management strategies and the use and distribution of crop varieties on their land. In Argentina, there has also been an increase in corn and soybean yield variability.[100]

In the Dry Corridor of Mesoamerica, particularly in El Salvador, Guatemala and Honduras, the effects of the drought associated with the 2015/2016 El Niño phenomenon were severe and prolonged, and led to significant reductions in agricultural production, with estimated losses of between 50 and 90 percent of crops. In Guatemala, the Ministry of Agriculture, Livestock and Food estimated that 82 000 tonnes of corn had been lost, which represented total financial losses of USD 30.8 million, while 118 200 tonnes of black beans were also lost at a cost of USD 102.3 million.[101] In Uruguay, for example, corn production during 2023 was well below average due to drought.[102]

It is important to highlight that the impacts on national food production are not only due to variations in the type and geographical distribution of climate variability and extremes, but there are also differences due to the diversity and complexity of agrifood systems. Possible differences between crops and cropping patterns, farming technologies implemented on each farm, and agriculture management systems mean that production impacts are not homogenous among areas that may be experiencing similar levels of climate variability and extremes.[103] Assessments made at the farm level indicate that vulnerability to climate risks differs based on the context of these farms.[104, 105] These factors, in turn, lead to lower levels of innovative capacities and adaptability when faced with climate variability and extremes.

[n] Agricultural productivity is defined as the quantity of agricultural products per input used to generate them.

[o] A catastrophe is a serious disruption of the functioning of a community or society at any scale due to hazardous events (such as extreme climate events) that interact with conditions of exposure, vulnerability and capacity, causing one or more of the following effects: human, material, economic and environmental losses and impacts. See United Nations. 2016. Report of the Open-ended Intergovernmental Expert Working Group on Indicators and Terminology relating to Disaster Risk Reduction : note / by the Secretary-General. New York. https://digitallibrary.un.org/record/852089?v=pdf

[p] These include a series of climate extremes such as storms, flooding, drought, extreme temperatures and other events, including insect infestation, wildfires, earthquakes, landslides, mass movement and volcanic activity.

When looking at damage and losses in agriculture due to hazards at a worldwide level, between 2007 and 2022 the main impact of drought is on agriculture, since more than 65 percent of the losses related to this phenomenon are seen in this sector, while in the case of flooding this same impact is estimated at around 20 percent. While not all hazards are related to climate extremes, some of them (drought and flooding) have been increasing in recent years. Looking at all climate events as a whole, crops and livestock are the subsectors that account for most of the losses. Although the losses registered for fisheries and forestry represent a significantly smaller proportion (3 and 1 percent, respectively), information on these sectors is scarce so the numbers could be an underestimation of the real losses.[106]

Analysis of the association between climate variability and the production and productivity of crops of selected foods in Brazil, Chile and Mexico

An analysis of climate variability and its association with the production and productivity of specific crops of certain foods in Brazil, Chile and Mexico was carried out using data on the yield of various crops collected through their national statistical institutes, as well as data on precipitation and temperature from the Climate Research Unit (CRU) of the University of East Anglia.[q]

The goal of this analysis is to estimate, at a small scale, the relationship with recent climate variability (as measured by changes in temperature and precipitation at the local level) and the crop yields of selected foods (barley, banana, cassava, corn, potato, rice, sorghum, soy, tomato and wheat). Although the dependence of crop productivity on climate is well known, the analysis aims to show evidence related to the negative effect suspected due to the recent climate trends.[r] Moreover, by carrying out an analysis at such a small scale and including different crops, the heterogeneity of the effects can be identified, with significant variation across regions and crops within the same country.

The countries were selected due to the availability of data on agricultural production at the subnational level, which was required to carry out the analysis in the different territories of each country since the effects of climate variability are not distributed homogeneously in the national territory. Considering that the impact of climate variations on each crop may not be the same, an estimate must be made at the subnational level for each combination of territory and type of crop. In addition, the selection of crops[s] was based on those that had the highest levels of production, to compare the various effects observed in different countries.

[q] This analysis only includes productivity indicators, while food availability depends on a series of factors.

[r] Annex 2 shows trends in climate variability for the three countries, using the Standardized Precipitation and Evapotranspiration Index (SPEI).

[s] While fish and livestock products are likely to be similarly affected by the events studied, these products were not included in the analysis due to lack of data availability at a small scale.

For each political unit (municipalities in Brazil, regions in Chile and states in Mexico) a model estimated the effects of climate variables on crop yields, while accounting for extreme events and technological improvements. The current values of the yields are then compared to the predicted values to estimate the probable effect on crop yields due to the climate variability trend at the local level (see Annex VI for the full methodology used).[t]

TABLE 16 compares the predicted yield versus the observed yield for each of the crops, estimating the percentage change of yields due to climate variability in recent years. The periods used for this analysis range from the first year with observed data available for each country[u] until 2016 (observations from 2017 to 2022 are used for cross-validation).

TABLE 16
Average percentage change in yield of each crop for Brazil, Chile and Mexico due to climate variability, 2017–2022

	Brazil	Chile	Mexico
Barley	-2.05%	-0.75%	0.35%
Banana	0.61%	-	-1.15%
Cassava	-1.31%	-	-
Corn	-1.13%	-0.91%	-0.53%
Potato	-0.29%	-0.06%	-0.90%
Rice	-1.51%	0.11%	1.07%
Sorghum	-1.65%	-	-0.21%
Soy	-0.93%	-	1.18%
Tomato	-	-	-0.07%
Wheat	-1.19%	-0.25%	-0.31%

Note: In cases where the statistical models are not significant for the region and crop combinations, the result is not estimated.
Source: Author's own elaboration based on yield data from national statistical institutes and precipitation data from the Climate Research Unit.

In Brazil, it is observed that the yield of all crops, except for banana, decreased by around 1 percent on average, with barley showing the greatest decline of 2 percent on average. In the case of Mexico, the yields of six of the ten crops were reduced, but with a lower intensity than in Brazil. Finally, in Chile, although four of the five crops presented reductions in average yield, the percentage changes observed were lower than in the rest of the countries analysed.

Once the average percentage change in yield per hectare is estimated, the change in total production can be estimated (TABLE 17). For each of the crops, the total estimated change in production is calculated by multiplying the estimated change in yield by the total observed cultivated area in the reference period.

[t] Data through 2016 is used and the period between 2017 and 2022 is used for cross-validation to ensure that only in-sample predictions are compared. Once this is done, the level of significance of the joint model is tested and, if this is significant, the production differences between the predicted yield and the observed yield of the different crops are calculated.
[u] The starting years of data collection are Brazil (1974), Chile (1980) and Mexico (1980).

TABLE 17
Total change in production for each crop in Brazil, Chile and Mexico (tonnes per year)

	Brazil	Chile	Mexico
Barley	-7 246.02	-957.23	-6 457.09
Banana	33 433.02	-	-21 062.42
Cassava	-5 694.05	-	-
Corn	-748 028.22	-5 669.04	11 788.06
Potato	1 850.10	-505.78	-7 198.04
Rice	-9 852.38	297.88	1 642.02
Sorghum	-492.69	-	-47 607.07
Soy	-154 983.20	-	3 957.95
Tomato	-	-	-15 061.19
Wheat	-80 119.07	-7 435.17	-16 002.82

Note: In cases where the statistical models are not significant for the region and crop combinations, the result is not estimated.
Source: Author's own elaboration based on yield data from national statistical institutes and precipitation data from the Climate Research Unit.

TABLE 17 shows how a relatively small change in yield can have a large impact on total production for certain crops. This is observed in the case of Brazil, which is one of the largest corn producers in the world, where a 1 percent decrease generates an estimated reduction in production of approximately 750 000 tonnes per year. A similar scenario is observed in Mexico with sorghum production where a 0.21 percent decrease in yield would translate into about 50 000 tonnes less production per year. Finally, in the case of Chile, a significant decrease is observed for wheat where a decrease in the average yield of 0.25 percent would translate into a loss of more than 7 000 tonnes of annual production.

As noted, the effects are not homogeneous at the national level; regions of the same country are affected in different ways by climate variability and extremes. Such effects depend on a combination of several factors such as soil conditions, crop types, rainfall levels and the economic development of the region. In extreme cases, results with opposite signs were found. In Mexico, although the productivity of corn decreased in most states, it increased in a few with larger cultivated areas, thus leading to greater national production. A region's economic capacity to address climate events plays an important role in the effects on agricultural outcomes. In this regard, the most economically vulnerable regions are often more likely to be negatively affected by climate variability and extremes.

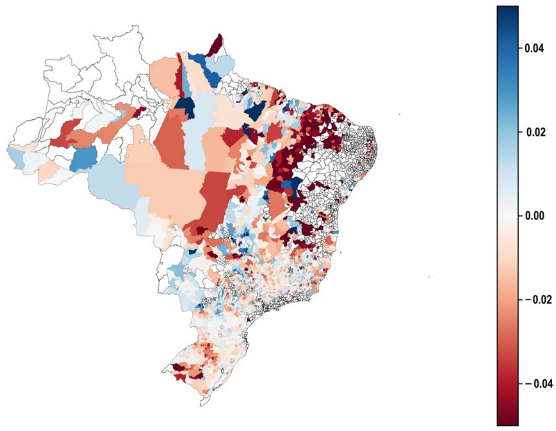
FIGURE 39.A, 39.B and 39.C show these differences in change in the average yield for corn. An index greater than 0 (blue) indicates increases in average performance, while an index less than 0 (red) indicates decreases in performance. In Mexico, in the northwest and southwest zones, the yield of corn crops increased, while in the northeast, north-central and western zones the yield decreased. In the central zone of Chile it is observed that in all the regions the performance decreased, but with different intensities. Finally, a high degree of heterogeneity in the variation of corn yield is observed in the regions of Brazil. This reinforces the idea that climate variability imposes dissimilar effects in different areas of the countries due to other factors, with productivity increases in certain areas and decreases in others. However, an analysis at the aggregate level shows that these climate events are generally associated with

crop production losses. These crop losses can then translate into higher prices of food items, which reduces the capacity of households to access nutritious foods in the quantity and quality required.

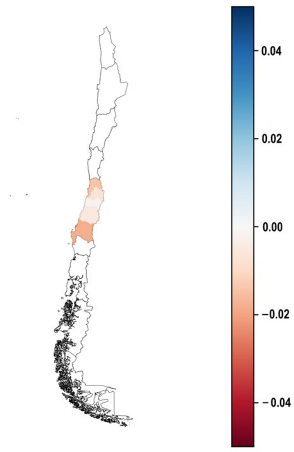
FIGURE 39

Variation in average corn yield associated with climate variability

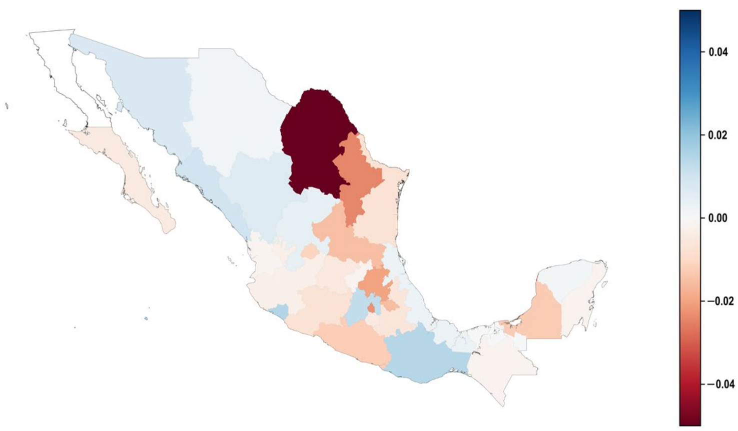
A) Brazil



B) Chile



C) Mexico



Notes: In cases where the statistical models are not significant for the region and crop combinations, the result is not estimated. The figure shows the variation in corn yield for each political unit during the period 2017–2022. Blue areas indicate an increase in average yield, while red areas indicate a decrease. Refer to the disclaimer page for the names and boundaries used in this map.

Source: Author's own elaboration based on yield data from national statistical institutes and precipitation data from the Climate Research Unit.

6.4 CLIMATE VARIABILITY AND EXTREMES AND FOOD ACCESS

As a dimension of food security, access to food corresponds to whether households have sufficient physical and economic means.[107] The latter, which is associated both with household income and food prices, is analysed from the perspective of people lacking the income to feed themselves high quality food regularly, given the low purchasing power of the population. As for the lack of physical access, this occurs when people are unable to obtain food, even if it is otherwise available in the broader market. The geographical isolation of populations and the lack of infrastructure can affect the ability of households to obtain food that is in adequate condition, either permanently or temporarily. Changing agrifood systems have created two new types of phenomena: 1) food deserts are geographic areas where residents have limited or no access to diverse, fresh or nutritious foods due to the absence or low density of "food entry points" within practical travelling distance; and 2) food swamps are areas where there is an overabundance of foods of high energy density and minimal nutritional value. Such food swamps offer few options for affordable, nutritious foods.[108]

In the region, current trends of undernourishment and food insecurity are related mostly to economic access rather than food availability. In fact, the Latin America and the Caribbean region has enough food to feed its entire population, making poverty and high levels of inequality in the region an important factor of vulnerability in the face of climate variability and extremes.

According to data available from the World Bank's World Development Indicators Database, Latin America continues to be the region with the highest inequality levels as measured by the Gini index.[v] Inequality plays a major role in terms of access since it hinders the ability of various subgroups of the population to purchase food items if combined with high levels of poverty and extreme poverty. Although progress has been made in terms of both reducing levels of poverty and increasing population income levels in recent years in Latin America and the Caribbean, in some countries the Gini index has increased above pre-COVID-19 pandemic levels, highlighting that challenges to improving food access persist in the region.[109]

Climate variability and extremes can generate income losses for people whose livelihoods depend on agriculture and natural resources and can also generate increases in food prices, thereby affecting the income and purchasing power of the general population, especially of lower income households that allocate a greater proportion of their income to food. Consequently, this can exacerbate poverty and income inequality, thereby impacting economic growth.[110, 111] By reducing income and purchasing power, economic access to food is impaired, thus contributing to undernourishment and undernutrition, causing food insecurity and making healthy diets less affordable, which could also contribute to obesity and diet-related NCDs as households opt for cheaper foods of lower nutritional value.[112]

It is also important to consider that certain characteristics related to economic access can exacerbate the effects of extreme climate events. Factors such as the level of income or wealth, poverty, inequality, dependence on agriculture or activities reliant

[v] This calculation was done by taking an average of the Gini index for each country with data available from 2017 to 2023.

on natural resources, among others, can exacerbate the effects of extreme climate events.[113] This relationship is seen in three ways: 1) people living in poverty have higher levels of exposure to extreme climate events; 2) people in poverty suffer greater losses in proportion to their income level; and 3) people have fewer resources with which to recover from these shocks.[114]

Climate variability and extremes can impact the different livelihood (or "capital") assets of households and individuals, which presents significant challenges to the ability of people to cope with these events and to continue with their subsistence strategies afterward. Livelihood or capital assets include economic, human, physical, natural and social capital, which are essential for generating resources to reduce poverty.[115,116,w]

Loss of income for people whose livelihoods depend on agriculture and natural resources

As analysed in the availability section, extremes could have effects on food production, affecting crop yields and causing crop loss. Furthermore, extreme climate conditions can also impact the livelihood assets and capital of smallholder farmers whose livelihoods depend on agriculture.

Family farmers play a crucial role in global food production, as their production contributes to approximately 80 percent of the world's food value.[117] In Latin America and the Caribbean, previous studies showed that family farming represented 81.3 percent of agricultural holdings.[118] Family farming provides between 27 and 67 percent of total food production in different countries, in addition to generating between 57 and 77 percent of agricultural employment in the region, which means that it is a key sector for guaranteeing food security.[119] In the Plurinational State of Bolivia, for example, 85 percent of family farmers were food producers in 2015.[120] In Brazil, the last agricultural census of 2017 found that 76.8 percent of all agricultural production units were family farms.[121] In Mesoamerica, there are various territories with a high proportion of subsistence crop farmers, who tend to have fewer adaptation resources and are more vulnerable to extreme climate events.[122]

In the region, smallholders play an important role in food security and nutrition, but at the same time they are quite vulnerable to the effects of climate extremes on food security and loss of livelihoods,[123] considering that a significant number of them live in rural areas and poverty affects 41 percent of rural households, while extreme poverty affects 19.5 percent, which is 12 and 8.3 percentage points above the rates of total poverty and extreme poverty, respectively.[124]

A large part of the rural population in poverty tends to depend on agriculture and other activities that are closely linked to natural resources, which means extreme climate events directly threaten their livelihoods and food security.[125,126] Furthermore, rural populations in poverty have lower access to financial resources such as savings, credit and insurance, which hinders their ability to adapt and recover.[127] In addition,

[w] The more diverse these assets, the more secure the livelihood. FAO's Livelihood-based Coping Strategy Index tracks how households manage food insecurity during emergencies, categorizing strategies into stress, crisis and emergency levels, each with varying long-term impacts on future productivity.

the precariousness of infrastructure and public services, as well as the informality of employment, leaves them even more exposed to the effects of extreme climate events.[128] It should be noted that structural inequalities make rural women more vulnerable to the effects of climate extremes (see BOX 5).

This means that a large part of the rural population in the region is exposed to the effects of climate variability and extremes. Faced with the loss of crops or productive assets as a result of these climate events, family farmers see both their access to food for self-consumption and their income affected, which reduces their economic access to food. Also, certain climate extremes such as high temperatures that cause heat stress[x] can make it impossible to work outdoors, or reduce the possibility of doing so, which impacts farmers' incomes.[129] Additionally, climate extremes that affect production also affect the agricultural labour market, which can also lead to a reduction in agricultural workers' incomes.

All of the above can have an impact that goes beyond immediate access to food and can also influence long-term access strategies. For example, loss of income and livelihoods can lead farmers to sell productive assets, thereby limiting their future income especially for smallholders who have fewer productive assets. Additionally, many livestock diseases are related to climate extremes, which can lead to significant short- and long-term food and income losses.[130]

In Mesoamerica, for example, the reduction in rainfall and high temperatures caused by the El Niño phenomenon in 2023 caused partial and even total losses of staple foods of rural households with fewer resources located in the Dry Corridor and Alta Verapaz department in Guatemala. As a result, at the end of that year, these households had to resort to purchasing staple foods earlier than usual, which adds to the fact that they had not managed to recover from various past climatic and economic disturbances. This forced households to adjust the amount of food consumed and to resort to unsustainable coping strategies leading to higher levels of food insecurity.[131] There is also evidence that low rainfall alternating with rainy seasons is affecting the Dry Corridor and the tropical Andes.[132] Also, country-based evidence, focused on smallholder farmer households in rural areas of Guatemala and Honduras, showed that 56 percent of households experienced recurrent (seasonal) food insecurity, 36 percent faced episodic food insecurity due to extreme climate events, and 24 percent experienced both types of food insecurity.[133,y,z]

Another example of this is observed in the Bolivarian Republic of Venezuela, where a gradual decrease in rainfall has had an effect on the production levels of smallholders, who have seen their income level reduced, making it difficult for them to have economic access to other foods.[134] In the case of the Caribbean, the 2023 Food Security and Livelihoods Survey, developed by the Caribbean Community (CARICOM) in conjunction with the World Food Programme (WFP), showed that of the people

[x] Heat stress refers to heat above what the body can tolerate without suffering any physiological deterioration
[y] Recurrent food insecurity is defined as a situation where a farmer regularly experiences food insecurity each year, usually on a seasonal basis. Episodic food insecurity is defined as a situation where farmers suffer food shortages as a result of a specific extreme climate event.
[z] Please note that these indicators of food insecurity are different than those for Target 2.1.2 of the SDGs, which is mentioned in CHAPTER 2 of this report.

surveyed who had been affected by extreme climate events, nearly two-thirds reported moderate (47 percent) or severe (17 percent) impacts on their livelihood or income.[135]

BOX 5

GENDER DISPARITIES RELATED TO CLIMATE VARIABILITY AND EXTREMES

The relationship between gender and climate vulnerability is complex,[136] since women and men face different situations of climate vulnerability and, therefore, have a different climate resilience capacity. While a similar share of men and women work in agriculture globally, limitations in terms of access to resources and other assets such as technology, credit, land, inputs and services leave women in a situation of greater vulnerability and with a lower capacity to adapt. Although progress has been made in reducing gender gaps regarding access to financial services, mobile internet and mobile phones, there is still a long way to go to reduce women's vulnerability to climate extremes.[137]

Studies reveal that the impacts of climate extremes tend to affect women differently and more acutely than men.[138] The greater vulnerability of women to the effects of climate extremes is primarily related to structural inequalities in economic, political and social terms.[139] For example, rural women face higher rates of poverty and moderate or severe food insecurity. In addition, women's workloads, including those hours worked in the agriculture sector, tend to decrease less than men's during the occurrence of extreme climate events.[140]

In this context, the effects of climate variability and extremes can deepen existing gender inequalities. People in situations of poverty and marginalization, which include an overrepresentation of women, generally have less capacity to cushion even the most moderate climate risks. Climate events are, therefore, an additional burden and can push women towards poverty as they directly and severely impact access to various livelihoods.[141]

New evidence from The unjust climate, a report by FAO, shows that there are persistent gaps between men and women when facing climate extremes. Female-headed households experience on average a loss of 8 percent more of their income due to heat stress and 3 percent more due to floods, compared to male-headed households. Furthermore, exposure to an additional day of either extreme temperatures or precipitation reduces the total income of female-headed households by 1.3 percent, compared to a 0.5 percent reduction in the total income of male-headed households.[142] This loss of income translates into women not being able to purchase nutritious foods in the quantity and quality required.

Furthermore, when faced with climate extremes, additional burdens placed on women due to care work also restrict their mobility options when looking for different jobs to lessen the negative economic impacts of these shocks. Generally, in low- and middle-income countries, rural women are responsible for finding and collecting water, food and fuel, and for doing agricultural work for self-sufficiency,[143] which means they may have disproportionate exposure and sensitivity to changes in water availability that is exacerbated by climate variability and extremes. Given the increased pressure on water resources and the resulting vulnerability of the agriculture sector, this could further increase the burden of water collection on women, both for domestic and productive purposes, thereby further diminishing their ability to access paid work or search for alternative options to improve their livelihoods and cope with these events.[144]

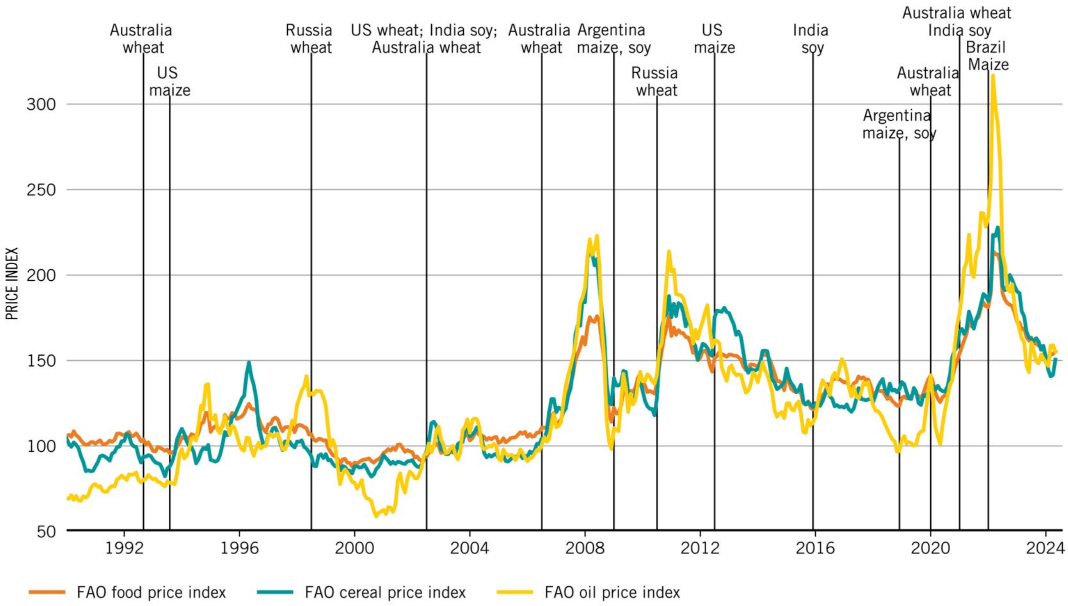
Increases in food prices following extremes

In addition to the direct impact on the income of those directly involved in food production, the occurrence of climate variability and extremes often leads to an increase in food prices, which represents a significant challenge for food accessibility, both in terms of quality and quantity. This price escalation can be attributed to several factors and channels.

Firstly, crop yields naturally depend on climate and, while food prices may change in response to climate variability, extreme climate events can cause long-term damage to crops due to flooding or prolonged drought, for example. These disruptions lead to decreased crop yields, reducing the overall supply of agricultural products. The resulting shortages amplify the imbalance between supply and demand, putting pressure on food prices as markets are affected by reduced availability of essential crops. Recent research has shown this linkage at a national[145] and international[146] level. Losses in crop productivity can harm livestock feeding, and some livestock diseases are even associated with extreme climate events.[147] In addition, even before the immediate physical effects of climate extremes, the expectations of traders play a role in determining food prices and are also influenced by these events. Markets respond immediately to anticipated supply shortfalls in the event of extreme climate events, and expectations can anticipate more than 80 percent of the total price impact.[148]

FIGURE 40 shows trends in international food, cereal and oil prices. Considering the most produced crops in the world, the vertical lines indicate events when a top five global producer of a crop had yields 25 percent below the trend line, indicating a seasonal climate extreme. In many of these instances global food prices rose.

FIGURE 40
Food price spikes follow climate extremes for top global cereal producers, 1990–2024



Note: The plot shows the history of FAO food and cereal price indices (composite measures of food prices), with vertical lines indicating events when a top five producer of a crop had yields 25 percent below the trend line (indicative of a seasonal climate extreme). All indices are expressed as a percentage of 2002–2004 averages.
Source: FAO. 2024. World Food Situation: FAO Food Price Index. [Accessed July 24 2024]. https://www.fao.org/worldfoodsituation/foodpricesindex/en. Licence CC-BY-4.0. and FAO. n.d. World Food Situation In: FAO. [Accessed July 24 2024] www.fao.org/worldfoodsituation/foodpricesindex

Although prices depend on many factors, there is evidence that climate variability and extremes have effects on price volatility. A study spanning from 1960 to 2014 shows that the effects of climate variability on the volatility of international corn prices intensify during the spring and summer phase of the El Niño phenomenon. Soybean price volatility was also observed in response to climate variability, declining slightly during the fall and winter seasons and increasing during the spring and summer.[149]

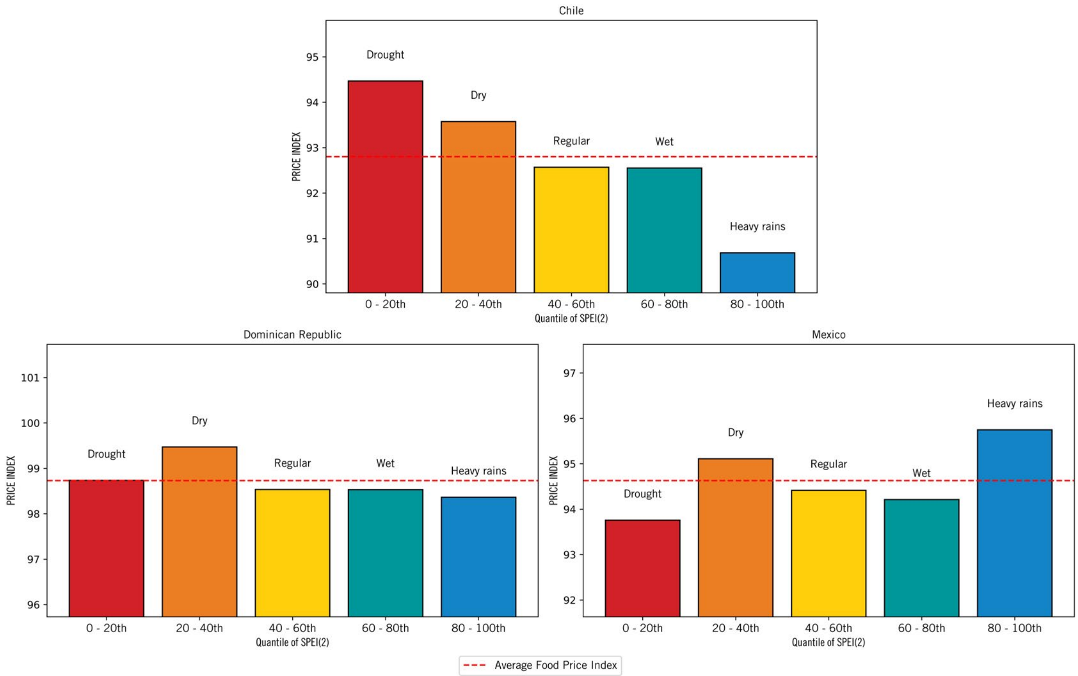
As well as wholesale prices, climate variability and extremes can affect local consumer price indices (CPI). There is statistical evidence from a study in Bangladesh showing that the price of a food basket in communities affected by flooding, drought or cyclones is higher than in control communities and that this effect can last up to nine months.[150] Another study at the global level shows that higher temperatures increase food inflation persistently over 12 months, with further impacts from daily temperature variability and extreme precipitation.[151]

In addition, increases in domestic prices are evident after climate extremes in various countries of the region. For example, correlation analysis show that higher average temperatures coincide with higher corn prices in Nicaragua.[152] In Mexico, concerns over the impact of drier and hotter weather conditions on crops also led to higher corn prices in most markets in October 2023, despite the start of the main harvest season.[153] Dry conditions during the third quarter of 2023 also caused retail prices of rice to rise for the fourth consecutive month in the Dominican Republic, in response to concerns about the impact of these conditions on crop yields.[154] Drought has also had major impacts in South America. In Argentina, it is estimated that the corn harvest was 25 percent below average, causing local prices to increase by more than 20 percent between September and October 2023.[155] Meanwhile, excessive rainfall in Ecuador led to losses of the 2023 main paddy crops, which led to an increase in wholesale prices of between 32 and 54 percent in interannual terms in 2023.[156]

FIGURE 41 shows the average consumer price index for food in three countries of the region in periods of drought, dry, regular and wet periods, and periods of intense rain during the period 2000–2021.[aa] Unconstrained by any parametric model, this visual inspection suggests that the vulnerability of prices to climate variability affects the region in a heterogeneous manner. In some cases, during climate extreme periods, the monthly food CPI tends to exceed the average. Specifically, in Chile, during periods of drought the food price index significantly exceeds the average, while periods of heavy rains are associated with a CPI below the average. In Mexico, the opposite scenario is observed, with periods of heavy rain being associated with higher values of CPI. Finally, in the Dominican Republic, it is observed how average prices tend to be higher in dry periods. This evidence highlights the necessity of countries to adapt to their specific scenarios to mitigate the effects of climate variability on food prices.

[aa] The classification from drought to heavy rain is based on the SPEI quantiles (2).

FIGURE 41
Average consumer food price index after an extreme climate event between 2000 and 2021



Note: SPEI values are split into equal quantiles.
Source: Authors' own elaboration based on World Food Situation: FAO Food Price Index. [Accessed July 24 2024]. <https://www.fao.org/worldfoodsituation/foodpricesindex/en. Licence CC-BY-4.0>. (For information regarding food price data) and CSIC. 2024. Global SPEI database. [Accessed July 24 2024]. https://spei.csic.es/database.html#p4. Licence ODbl1 (For information regarding precipitation data)

It should be noted that the impact of the price increase depends on a series of factors, such as the income level of both countries and households, and the availability of food reserves. Thus, in low- and middle-income countries the effect of the increase in the price of basic products on consumer prices has a greater impact than in high-income countries.[157,158] Also, in households in the lowest income quintiles, the increase in the food CPI has a greater impact than in higher-income households, because a larger share of their income is allocated to food, thus impacting the quantity and quality of food consumed in households.[159, 160, 161,162]

In addition, in some cases initial food price shocks resulting from climate extremes may be exacerbated by other shocks occurring at the same time, such as increases in fuel prices, job and lower incomes. Furthermore, speculation may generate a greater effect on prices, especially affecting the most vulnerable groups of the population.[163,164] Therefore, in the event of extreme climate events, increasing imports or stocks at the beginning of the season can reduce this volatility.[165]

It is important to note that access to food must be viewed not only from an economic standpoint, as there could also be physical restrictions in this regard as shown in BOX 6.

BOX 6

CLIMATE EXTREMES AND PHYSICAL ACCESS TO FOOD

In the occurrence of an extreme climate event, the reduction in the access to food may not only be related to economic factors but could also be the result of a lack of physical access. A study in the United Kingdom of Great Britain and Northern Ireland shows that physical access to food is related to transport systems (availability and access), physical well-being and the retail environment. In addition, limited access to food affects vulnerable groups in different ways, with the elderly more likely to have issues related to physical well-being, while all vulnerable groups are more likely to be affected by access to transport systems.[166]

One of the several impacts of climate extremes is related to the disruptions affecting critical infrastructure, including roads, transportation, markets, energy and water, among others. There is an important interdependency between the different infrastructure networks and failure of key infrastructure components can significantly increase travel times[167] or isolate a territory or town. Also, during extreme weather conditions the possibility of going to markets to purchase food could be reduced and infrastructure disruptions may affect the capacity of emergency response. These disruptions could lead to difficulties in physical access to all kinds of food or certain types of food, and could result in food insecurity, undernourishment and different forms of malnutrition.

The concentration of relevant infrastructure in cities and rapid urbanization, including peri-urban development, is a major driver of risk for disruption of infrastructure when cities are affected by climate extremes like landslides.[168] Regarding rural areas, climate extremes could interrupt access routes and fuel supplies, while isolating rural populations. Also, in extreme cases, the interruption of access to food and the alteration of markets and infrastructure can lead to the displacement and emigration of rural populations.[169]

The physical access of consumers to diverse types of food, in combination with their food consumption patterns, influences what they purchase and consume.[170] In this regard, the concepts of food deserts and food swamps are used, meaning residents either have limited or no access to food due to the absence (or low density) of food entry points at a practical distance for travel (food deserts), or they have an overabundance of foods of high energy density and minimal nutritional value and poor access to nutritious food (food swamps).[171]

The disruption of the supply chain or difficulties in accessing markets could affect the diversity of food consumed, with limited access, for example, to food that needs refrigeration, including nutritious food like fruits, vegetables and fish. In more severe cases, this could affect the quantity of food, limiting access to and consumption of any type of food. The disruption could then affect dietary patterns, leading to a food desert or food swamp while the emergency persists, thereby jeopardizing food security and nutrition. As an example, the disruption of supply driven by the COVID-19 pandemic affected the physical access to sufficient, diverse and nutritious food.[172] Food consumption habits changed during the COVID-19 pandemic, with an increase in the consumption of canned, packaged and non-perishable food.[173]

6.5. CLIMATE VARIABILITY AND EXTREMES AND FOOD UTILIZATION

When food is available and households have adequate access to it, food utilization refers to whether households are maximizing the consumption of adequate nutrition and energy. Sufficient energy and nutrient intake by individuals are the result of good caring and feeding practices, food preparation, dietary diversity, intra-household distribution of food, and access to clean water, sanitation and health care. Combined with good biological utilization of food consumed, this can impact the nutritional status of individuals among other factors.[174]

In a context of climate variability and extremes, nutrition is susceptible to changes due to a series of factors. Reductions in food security and diet quality can pose a series of health risks and lead to higher levels of malnutrition and ill health.[175]

Water security is a key element of food safety as water can be a vehicle for pathogens and chemical contaminants to be transferred from the environment into the food chain, thus impacting food safety and public health.[176] Therefore, maintaining both a clean environment and the provision of clean drinking water is an important element of food safety. As water quality is of particular importance in ensuring the quality and safety of food items, it is especially important for nutrition and human health due to food consumption.[177]

In fact, an association between water insecurity and food insecurity has been observed (BOX 7).

BOX 7

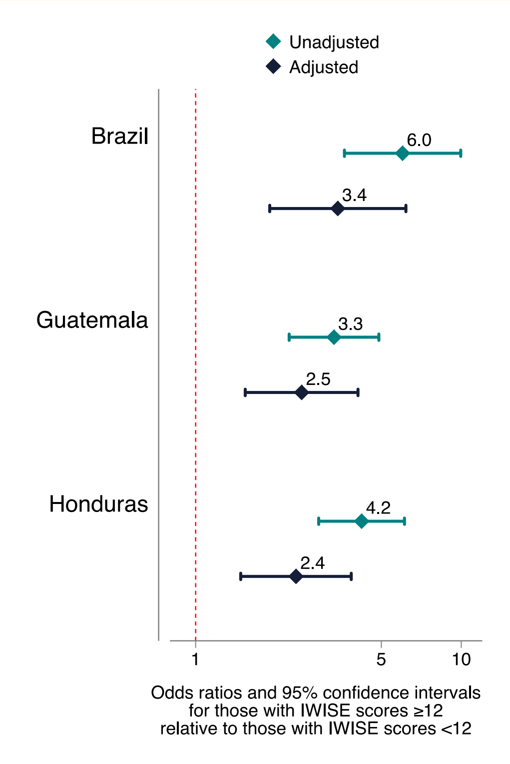
RELATIONSHIP BETWEEN WATER AND FOOD INSECURITY IN COUNTRIES IN LATIN AMERICA AND THE CARIBBEAN

Water is essential for nutrition and public health.[178,179,180] Water security is defined here as the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being and socioeconomic development, with the purpose of ensuring protection against water-borne pollution and water-related disasters, and preserving ecosystems in a climate of peace and political stability.[181] Achieving water security requires that allocation among users be fair, efficient and transparent to ensure that water to satisfy basic human needs is accessible to all and at an affordable cost to the user.

Water security is necessary for food security. Globally, there is evidence that water insecurity[182] is positively associated with food insecurity.[183,184,185,186] FIGURE A shows the association between water insecurity and food insecurity[*] in nationally representative samples of adults in three Latin American countries (Brazil, Guatemala and Honduras). In these three countries there is a high prevalence of water insecurity, which in 2020 reached 16.1 percent in Brazil, 24.2 percent in Guatemala and 47.2 percent in Honduras.

FIGURE A shows that water insecurity was a strong predictor of food insecurity in Brazil, Guatemala and Honduras. This strong positive relationship held when controlling for many of the known predictors of food insecurity. The odds of experiencing food insecurity remained strong for those who experience water insecurity, even after adjusting for socioeconomic covariates and the impact of the COVID-19 pandemic. For example, in Brazil, a person who is moderately-to-severely water insecure has 3.4 times the odds of experiencing moderate-to-severe food insecurity compared to someone who is experiencing zero to marginal or low water insecurity. The odds of experiencing food insecurity were also much higher for someone experiencing water insecurity in Guatemala (2.5) and Honduras (2.4).

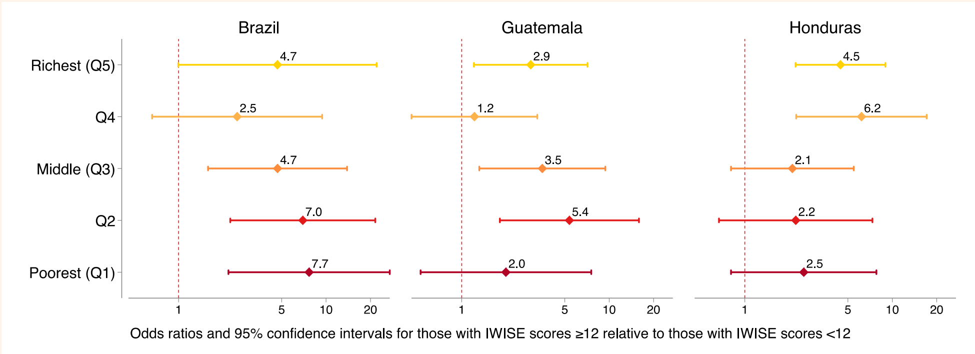
Figure A.
Unadjusted and adjusted odds ratios for experiencing moderate or severe food insecurity among those who are experiencing moderate-to-severe water insecurity relative to those with zero or marginal water insecurity in Brazil, Guatemala and Honduras



Note: The Individual Water Insecurity Experience (IWISE) Scale is composed of 12 questions about problematic experiences with water in the prior year, including water-related psychosocial distress, difficulties with drinking and cooking, and disrupted hygiene practices. 2020 Gallup World Poll sample for the three countries: 2 911 (Brazil: 972, Guatemala: 1 007 and Honduras 932).
Source: Gallup. 2020. Gallup World Poll (GWP)

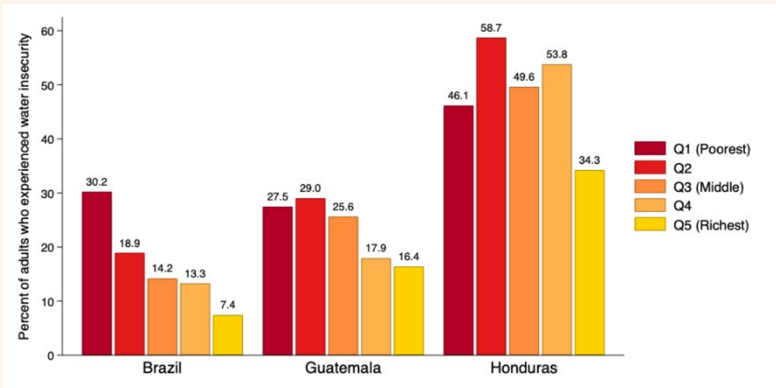
FIGURE B shows a positive relationship between water insecurity and food insecurity in each income quintile. And, although the burden (prevalence) of water insecurity is lower in higher income quintiles, water insecurity is still an issue for the richest quintile (FIGURE B).** This is particularly true in Honduras, where 34.3 percent of individuals in the highest income quintile were moderately-to-severely water insecure (FIGURE C).

Figure B.
Adjusted odds ratios and 95 percent confidence intervals for experiencing moderate-to-severe food insecurity among those who are experiencing moderate-to-severe water insecurity relative to those with zero or marginal water insecurity by income quintile participants in Brazil, Guatemala and Honduras



Note: 2020 Gallup World Poll Sample of respondents with complete data for the three countries: 2 911 (Brazil: 972, Guatemala: 1 007 and Honduras 932).
Source: Gallup. 2020. Gallup World Poll (GWP)

Figure C.
Prevalence of moderate-to-severe water insecurity by income quintile among participants in the 2020 Gallup World Poll in Brazil, Guatemala and Honduras with complete covariate data



Note: 2020 Gallup World Poll sample of respondents with complete data for the three countries: 2 911 (Brazil: 972, Guatemala: 1 007 and Honduras 932).
Source: Gallup. 2020. Gallup World Poll (GWP)

These results strongly suggest that experiences of water insecurity must be measured when seeking to understand and mitigate food insecurity (and likely, malnutrition). The benefits of concurrent consideration of water and food insecurity include the possibility of identifying unappreciated drivers of food insecurity and malnutrition, as well as improving the effectiveness of interventions and responses to climate extremes.

Understanding the strong relationship between water and food insecurity is important for developing more comprehensive and effective policies that appropriately address these two challenges through an integrated approach. This approach is increasingly important as climate variability and extremes continue to impact freshwater resources, which will in turn influence water and food availability and access at the individual, household, community and national levels.

For more information see ANNEX VII.

* The food insecurity indicator is calculated through the Food Insecurity Experiences Scale (FIES) and the water insecurity indicator is calculated based on the Individual Water Insecurity Experiences (IWISE) Scale.
** The interaction between water insecurity and income quintile was not important in any country (p-values for all interaction terms > 0.2).

Possible effects on nutrition and human health

One of the numerous ways in which climate variability and extremes could cause malnutrition and impact human health is through diseases. As has been shown, climate extremes could affect the range and outbreaks of infectious diseases,[187] and may alter the geographic distribution of some waterborne and vector-borne diseases.[188] These impacts on human health may in turn have effects on nutrition. The spread of vector-borne diseases such as malaria and dengue, facilitated by warmer and more humid climates, can negatively affect nutritional status, especially in children who are most vulnerable to malnutrition.[189,190]

In addition to the potential effect of the deterioration of food safety on nutrition, there is the effect of food insecurity on malnutrition. As seen in the previous sections, climate variability and extremes can cause crop losses or reduce agricultural yields, which lead to a reduction in household purchasing power, thereby affecting access to food. This affects members of low-income households to a greater extent, increasing their risk of suffering from food insecurity and forcing them to reduce the dietary diversity and nutritional quality of food consumed, which implies an inadequate intake of nutrients and energy, making them more likely to suffer different forms of malnutrition, including micronutrient deficiencies.[191]

Climate extremes, together with land degradation and unsustainable practices, will accelerate food insecurity trends,[192,193] which places children's food security and nutrition at risk. Additionally, changing precipitation patterns and drought influence the availability of water for agriculture and livestock production and increase post-harvest losses.[194,195] Extreme weather can also damage crops and reduce the size and quality of harvests, thus disrupting food production for children, as well as supply chains and infrastructure.

Households coping with food insecurity often turn to harmful strategies such as buying less food, skipping meals, and opting for lower-quality, less nutritious staples leading to children consuming less food and having poorer diets.[196] Additionally, climate extremes are contributing to a rise in overweight and obesity, as families turn to cheaper, energy-dense foods, while extreme heat reduces physical activity.[197]

Latin America and the Caribbean faces the world's largest gender gap in food insecurity, a disparity that is likely to widen as climate extremes progress. Pregnant women and mothers suffering from malnutrition are less able to provide adequate nutrition for their children. This can result in low birthweight, premature births, stunting, delivery complications, and increased risks of neonatal and postnatal death.[198,199]

Food insecurity driven by environmental and climate factors heightens the risk of malnutrition, making children more vulnerable to infection and disease. This creates a vicious cycle where malnutrition increases the likelihood of death in severely stunted children. While climate extremes themselves are not direct causes of non-communicable diseases such as cancer and diabetes, they reduce both food security and the quality of food, increasing the risk of people suffering hidden hunger or micronutrient deficiencies, which can further compromise children's immune systems, along with possible disruptions to healthcare services, while exacerbating environmental and social factors that contribute to cancer incidence and mortality.[200]

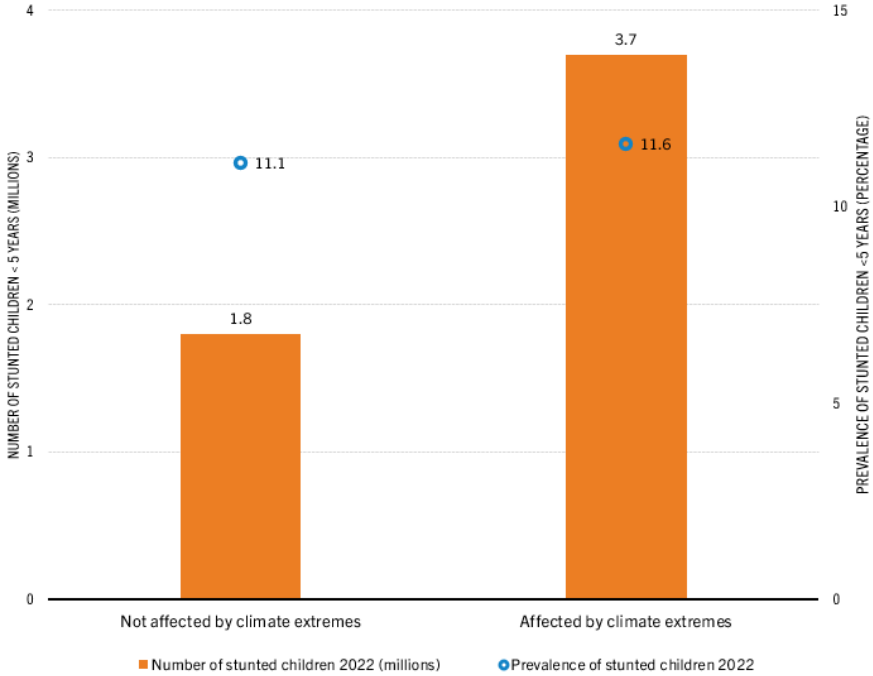
The severity of some of the region's nutrition indicators already reflects important deficiencies in infrastructure, public services and productive opportunities, which could further worsen due to the negative impacts of climate variability and extremes.

Under normal conditions, those most vulnerable to nutrient deficiencies are young children, adolescent girls, pregnant and nursing mothers, older adults, sick or immunocompromised people, low-income people,[201,202] and Indigenous Peoples.[203] Furthermore, studies have shown that the nutritional status and health of children, particularly child stunting, is especially vulnerable to extreme climate events, both in the development phase of the emergency and in its aftermath.[204,205] This can be particularly complex if it is combined with a lack of health services such as prenatal care services, immunization, supplementation and deworming, which increases the risk of child malnutrition. High levels of exposure to climate extremes further increases children's vulnerability to malnutrition, and the first 1 000 days of life are the most important period for influencing long-term nutrition and health outcomes.[206,207]

In this regard, the nutritional status of a pregnant and then lactating woman is relevant, given that it has an impact on the nutritional status of her children at birth and on the health and nutritional status that they will later have as infants. Extreme heat, which is a case of climate extreme defined as temperatures above the 95th percentile, can cause heat stress, and pregnant women are at a physiological disadvantage in properly regulating their body temperature. Extreme heat alters a series of physiological processes in pregnant women that put their health and that of the foetus at risk.[208] These alterations can translate into foetal malnutrition,[209] premature birth, a premature new-born and low birthweight[210] increasing the risk of mortality in new-borns and undernutrition in children under 5 years of age.

FIGURE 42 shows that, although the average prevalence of stunting does not change, the number of children with stunting in countries affected by climate extremes is significantly higher than in countries that are not affected (3.7 million vs 1.8 million).

FIGURE 42
Stunting in Latin America and the Caribbean countries affected by climate extremes



Note: The definition of countries affected by climate extremes, conflict and economic downturns follows the methodology adopted in The State of Food Security and Nutrition in the World 2024. See supplementary materials to chapter 3 of The State of Food Security and Nutrition in the World 2024 for details.
Source: Authors' own elaboration based on FAO. 2024. FAOSTAT: Food security indicator set. [Accessed July 24 2024]. https://www.fao.org/faostat/en/#data/FS. License: CC-BY-4.0 (for prevalence of undernourishment); and World Bank, WHO & UNICEF. 2023. Levels and trends in child malnutrition. UNICEF-WHO-The World Bank: Joint Child Malnutrition Estimates Key findings of the 2023 edition. Washington, DC, Geneva, Switzerland, and New York, USA. https://datatopics.worldbank.org/child-malnutrition, http://www.who.int/teams/nutrition-and-food-safety/monitoring-nutritional-status-and-food-safety-and-events/joint-child-malnutrition-estimates, https://data.unicef.org/resources/jme-report-2023 (for data on child stunting).

In the long-term, climate extremes can also influence the quality of food during the production stage, since they can affect the growth and reproduction times of crops and animals, which has an impact on how they absorb and produce nutrients and, finally, can affect the nutritional quality of foods.[211, 212]

Aside from the effects related to food consumption (energy intake), climate variability and extremes could also affect energy expenditure. Seasonality and weather impact the level of physical activity and sleeping patterns. Therefore, extreme weather conditions, such as high temperatures, could have a significant effect on the amount of physical activity or sleep quality across the population. This has repercussions on metabolism and energy expenditure, and could deteriorate human health and nutrition, including overweight.[213,214,215]

6.6. CLIMATE VARIABILITY AND EXTREMES AND FOOD STABILITY

Food stability involves ensuring the availability, access and utilization of food for households and individuals at all times.[216] It includes the capacity to guarantee food security in the event of sudden crises or cyclical events.[217] Stability problems can refer to short-term instability (which can lead to acute food insecurity) or medium or long-term instability (which can lead to chronic food insecurity). Climatic, economic, social and political factors can all be a source of instability.[218]

Climate variability and extremes are a threat to the stability of food security and nutrition, having effects on the other three dimensions of food security and nutrition. Therefore, everything described in the previous sections of availability (6.3), access (6.4) and utilization (6.5) is related to the concept of stability. Another relevant analysis is related to the extent to which climate variability and extremes could negatively affect the stability of food security and nutrition. In that sense, section 6.1 explains that some countries in the region are more exposed and more vulnerable to extreme climate events meaning their food security and nutrition is more threatened than in countries with lower exposure and vulnerability, with greater effects on their food security and nutrition.

Climate variability and the increasing frequency and intensity of climate extremes exacerbate impacts on agrifood systems and people's livelihoods in different ways, requiring accelerated actions that build capacities for anticipation, prevention, absorption, adaptation and transformation as key pathways towards resilience, while driving all decision making, policies and interventions.[219]

CHAPTER 7
STRENGTHENING CLIMATE RESILIENCE IN AGRIFOOD SYSTEMS TO ENHANCE FOOD SECURITY AND NUTRITION IN A CONTEXT OF CLIMATE VARIABILITY AND EXTREMES

Key messages

- The effects of climate variability and extremes on food security and nutrition create multidimensional challenges that demand comprehensive policies and interventions. These should include protecting people's livelihoods, building resilience capacities, promoting access to and consumption of healthy diets, enhancing healthy food environments and strengthening the governance mechanisms for agrifood systems.

- There is an urgent need to enhance the resilience of the agrifood system, through policies and interventions that address not only the direct impacts of climate variability and extremes on food security and nutrition, but also the underlying vulnerabilities, which are often exacerbated by the changing nature of the climate.

- Building climate resilience into agrifood systems is key to preventing the reversal of progress made on food security and nutrition. Achieving this resilience requires a holistic view that considers the broader set of objectives, anticipates a wider range of hazards, and identifies coherent policy and interventions. Addressing the impacts of climate variability and extremes and their impact on food security and nutrition also requires cross-sectoral action with stakeholder engagement at all levels.

- Governments and policymakers should adopt more comprehensive portfolios of policies, investments and legislation that contribute to developing the five capacities for resilience building (anticipate, prevent, absorb, adapt and transform), which are central to enabling the transformation of agrifood systems to end hunger, food insecurity and malnutrition and ensure affordable healthy diets for all.

- Policies across agrifood systems – food supply chains, food environments and consumer behaviour – should be strengthened through policies that help to build resilience in the agrifood system. The interaction among these elements is crucial for delivering accessible and affordable healthy diets. Additionally, it is essential to create synergies with other systems that support agrifood systems.

- This edition highlights a set of policies directly related to addressing the impacts of climate variability and extremes on food supply chains such as: early-warning systems and anticipatory action; sustainable, climate-resilient agricultural production; strengthening the capacities of family farmers and small-scale producers; and diversifying the food supply of importing countries, as well as policies aimed at promoting the resilience of people's livelihoods (social protection programmes and agricultural insurance).

- In addition, complementary policies to prevent increases in food insecurity and malnutrition in response to climate events are presented, such as school feeding programmes and the usage of food-systems-based dietary guidelines as key input for policy design.
- The process of building climate resilience in agrifood systems should be based on high-quality evidence, including robust data, state-of-the-art tools, and policy and investment analyses and scenarios. In the region, there is a need for a comprehensive agenda of work and research that addresses these interrelated issues. This evidence can help policymakers, donors, the international development community and the private sector to move quickly in times of need.

As shown in previous sections, climate variability and extremes, along with other drivers, impact agrifood systems (CHAPTER 5), which subsequently affect all dimensions of food security (availability, access, utilization and stability), as well as nutrition (CHAPTER 6). These impacts disproportionally affect social groups in the most vulnerable situations. In this context, building resilience into agrifood systems is critical for the region to prevent reversing progress made on food security and nutrition or exacerbating the poor nutritional situation in some countries.

Resilience is the ability of individuals, households, communities, cities, institutions, systems and societies to prevent, resist, absorb, adapt, respond and recover positively, efficiently and effectively when faced with a wide range of risks, while maintaining an acceptable level of functioning and without compromising long-term prospects for sustainable development, peace and security, human rights and well-being for all.[220, 221]

FIGURE 43 shows how climate variability and extremes, along with other drivers can impact agrifood systems and influence the immediate and underlying causes of food insecurity and malnutrition. Agrifood systems are also closely intertwined with other essential systems (environmental, social protection, healthcare and infrastructure such as water, energy and transportation, among others). Weaknesses and failures within these systems can cause crises in agrifood systems, and in turn, weaknesses in agrifood systems can lead to pressures on other systems.[222]

Policies should be tailored to address each of these drivers, seeking synergies among them and promoting coordination with policies in other systems. To transform agrifood systems in order to strengthen food security, improve nutrition, and enhance the affordability and consumption of healthy diets, while addressing the adverse impacts of climate variability and extremes, scaling up climate resilience across agrifood systems is urgently required.[ab, 223] To make this possible, robust governance, stable and adequate financing and comprehensive policies and investments for food security and nutrition are essential (FIGURE 44).

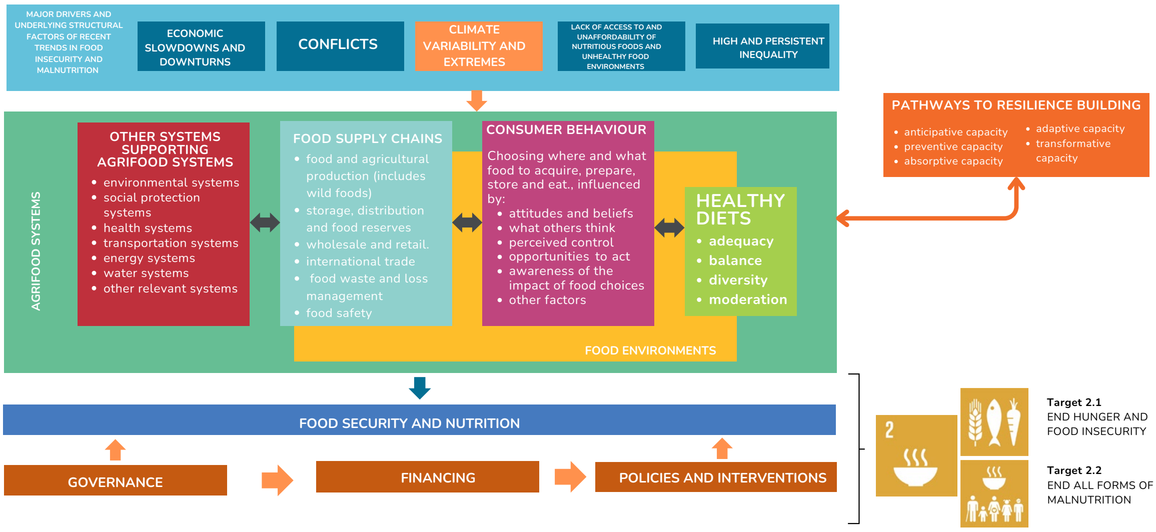
In addition, policies and interventions aimed at transforming agrifood systems and strengthening food security and nutrition must integrate, or be coherent with, measures for enhancing resilience in a broader sense, with special attention to the groups in the most vulnerable situations due to the differentiated and exacerbated climate impacts (BOX 5). Vulnerability is more critical in areas characterized by high dependence on climate-sensitive livelihoods, poverty, governance challenges and limited access to basic services and resources, among others.[224] Any increase in climate extremes has the potential to worsen the conditions of population groups in situations of vulnerability, thereby leading to adverse long-term developmental effects unless resilience is enhanced across all levels – productive, social, climatic and environmental.[225]

Therefore, policies and interventions enabled by governments, must contribute to developing the five capacities for resilience building (FIGURE 43): 1) anticipatory capacity to take early action in case of potential threats; 2) preventive capacity to implement activities and measures to mitigate existing risks and prevent the emergence of new risks; 3) absorptive capacity to take protective action and recover after a shock; 4) adaptive capacity to make incremental adjustments, modifications or changes to the characteristics of systems; and 5) transformative capacity to create a fundamentally new system when ecological, economic or social structures make the existing system untenable.[226,227] Developing these capacities also requires governance and financing mechanisms.

[ab] The State of Food Security and Nutrition in the World 2021 proposed six transformative pathways to strengthen the resilience of agrifood systems to the three major drivers behind the current trends of hunger, food insecurity and malnutrition and address the underlying structural factors: integrating humanitarian, development and peacebuilding policies in conflict-affected areas; scaling up climate resilience across agrifood systems; strengthening economic resilience of the most vulnerable to economic adversity; intervening along the food supply chains to lower the cost of nutritious foods; shifting food environments towards healthier dietary patterns with a positive impact on human health; and tackling structural inequalities, ensuring interventions are pro-poor inclusive. See FAO, IFAD, WHO, WFP & UNICEF. 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; and FAO, IFAD, UNICEF, WFP & WHO. 2024. The State of Food Security and Nutrition in the World 2024 – Financing to end hunger, food insecurity and malnutrition in all its forms. Rome, FAO. https://doi.org/10.4060/cd1254en – the latter includes the differentiation between major drivers and underlying structural factors.

FIGURE 43

Transforming agrifood systems to address the impacts on food security and nutrition



Source: Adapted from 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. FAO, Rome. www.fao.org/3/I9553EN/i9553en.pdf; FAO, IFAD, WHO, WFP & UNICEF. 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; FAO. 2023. The status of women in agrifood systems. Rome. https://doi.org/10.4060/cc5343en; FAO, IFAD, PAHO, UNICEF & WFP. 2023. Regional overview of food security and nutrition – Latin America and the Caribbean 2022: Towards improving affordability of healthy diets. Santiago, Chile. https://doi.org/10.4060/cc3859en; UNSDG. 2021. UN Common Guidance on Helping Build Resilient Societies. Executive Summary. https://unsdg.un.org/sites/default/files/2021-09/UN-Resilience-Guidance-Final-Sept.pdf

BOX 8

GOVERNANCE FOR FOOD SECURITY AND NUTRITION

Food security and nutrition governance refers to the formal and informal rules, organizations and processes through which public and private actors coordinate their interests, and to the decisions relevant to food security and nutrition that are made and implemented in a given country on behalf of the members of that society.[228] Therefore, this concept involves the set of processes, structures and mechanisms through which decisions are made and resources are managed in the field of food security and nutrition at the regional, subregional, national and subnational (territorial) levels.

Governance is essential for food security and nutrition as it implies that countries have the appropriate basic structure – laws, policies, plans, strategies and/or programmes – in place to protect the right to adequate food and prevent all forms of malnutrition, while facilitating access to healthy diets. In addition, governance is key to accelerating agrifood resilience and ensuring access to and the effective use of financial resources for achieving food security and nutrition.[229]

Governments play a key role in governance for food security and nutrition to improve regulatory frameworks, policies and plans that contribute to eradicating hunger, improving food security and reducing malnutrition. Also, they can facilitate the allocation of budgets and investments and the coordination between the different ministries and sectors required for the transformation of agrifood systems.

Effective governance means promoting and safeguarding a democratic, peaceful and stable society and an enabling environment in which individuals can feed themselves and their families in freedom and dignity. This requires promoting secure and equitable access to natural resources, fostering inclusive decision-making processes that involve local communities, Indigenous Peoples, women, and youth, and forging public-private partnerships with mechanisms for accountability.[230]

In relation to the organizational model regarding food security and nutrition, at the national level it is common to find councils (for example, the National Council for Food and Nutrition Security and Sovereignty [CONASSAN] in the Dominican Republic), committees, commissions (such as the National Food and Nutrition Security Commission in Belize* or the National Council for Food Security and Nutrition [CONSEA] in Brazil), boards or secretariats (such as the Secretariat of Food Security and Nutrition of the Presidency of the Republic [SESAN] in Guatemala, Panama's National Secretariat for the Food and Nutrition Security Plan [SENAPAN] and Chile's Executive Secretariat of the Choose Healthy Living System). Whatever form they take, these organizations are responsible for planning, coordinating, and even implementing food security and nutrition policies.[231] For example, national food and nutrition security councils may act as an advisory body to high-level authorities in designing policies and guidelines to ensure the human right to adequate food. These councils have been effective in promoting the realization of the right to food and encouraging civil society participation.[232]

Furthermore, to achieve decentralization and compliance with the objectives regarding food security and nutrition, as well as to accelerate compliance with the 2030 Agenda, local councils and committees are key. For example, in Colombia there are territorial committees (at the departmental and municipal level) for food security and nutrition, while in Guatemala there is the Municipal Commission of Food and Nutrition Security (COMUSAN), and in Costa Rica there are Cantonal Councils for Food and Nutritional Security (COSAN).

Governance is essential for repurposing policy support by establishing and enhancing coordination mechanisms both between institutions, which are often fragmented, and between different levels of governance, as well as for implementing measures of monitoring and evaluation. Furthermore, it is also important to promote the integration of food security and nutrition and climate issues into different sectors or policy areas to achieve a more coherent and integrated approach to the implementation of policies and solutions for agrifood systems transformation.[233]

Climate variability and extremes can have a negative impact on the four dimensions of food security and nutrition in different but related ways, heterogeneously affecting the population and their livelihoods and requiring a multisectoral response. This situation requires strong coordination across different ministries, public services and agencies, as well as with other actors that have a role in agrifood systems transformation. Investing efforts and resources in food security and nutrition governance is key to adopting a multisectoral approach to achieve more efficient, inclusive, resilient and sustainable agrifood systems that guarantee the right to adequate food.

* Between 2002 and 2020, Belize implemented the National Agriculture and Food Policy.

Governance is essential for food security and nutrition, as it implies that countries have the appropriate institutional structure in place to protect the right to adequate food and prevent all forms of malnutrition, while facilitating access to healthy diets at all times. One of the goals of formal governance mechanisms is to address complex and multisectoral problems such as food insecurity and malnutrition, finding agreement among different sectoral actors and levels of government, also incorporating non-governmental actors. While addressing climate extremes and variability, and in order to meet the SDG Targets 2.1 and 2.2 to recognize that climate policy areas are not always considered in food security and nutrition policy design, as they are often not part of the mandate of the ministries or agencies that are traditionally related (e.g. agriculture or social development ministries). Therefore, to incorporate climate as part of the food security and nutrition discussion, appropriate governance mechanisms (BOX 8), institutional structure and policies – laws, policies and plans (BOX 9), strategies and/or programmes – are needed. In addition, governance is key to accelerating the development of resilience in the agrifood system and ensuring access to and effective use of financial resources to achieve food security and nutrition.[234]

BOX 9

FOOD SECURITY AND NUTRITION POLICIES AND PLANS

Most countries in the region have policies[*] and plans[**] regarding food security and nutrition. In general, these documents include an analysis of the food and nutrition situation in the country, divided into the four main dimensions of food security,[235] and may also include measures associated with climate variability and extremes.

For instance, the National Food and Nutrition Security Policy and Action Plan (2017–2021) of the Bahamas indicates that one of the main sources of vulnerability to food insecurity is the impact of climate variability, so the policy objectives include strengthening resilience mechanisms in the face of various crises, including the climate crisis.[236]

At the subregional level, CARICOM has been implementing the Regional Food Security and Nutrition Policy since 2010, and in 2011 it approved the Regional Food Security and Nutrition Action Plan for the implementation of the policy. The regional policy contains several provisions related to the right to food and climate resilience and adaptability and their effects on food security and nutrition.[237] In addition, the Central American Integration System (SICA) developed the Food Security and Nutrition Policy of Central America and the Dominican Republic 2012–2032, which, among its lines of action, includes measures to reduce the impacts of extreme climate phenomena on food security and nutrition.[238, ***]

In terms of national plans, for example, among the proposed actions of the National Food Security and Nutrition Plan (2017–2021) of Panama is the achievement of a sustainable food supply, for which the implementation of the National Climate Change Plan is key for the agriculture sector.[239] In the Dominican Republic, the second National Plan for Food and Nutritional Sovereignty and

Security (2023–2026) is currently being implemented, which includes a climate change and risk management component. Another example is the National Food Security and Nutrition Action Plan (PLAN-SAN 2030) of Honduras, which, along with the Nutrition Action Plan (PANH 2030), forms part of the National Food Security and Nutrition Policy and Strategy for 2030 (PyENSAN 2030). Among the strategic objectives is strengthening the resilience of the Honduran population, especially the groups in the most vulnerable situations, to ensure stability in the availability of and physical access to food, or the means to afford it, particularly during emergencies caused by climate change, natural hazards, or other social or economic crises.[240]

It is also worth noting that the National Sovereignty Strategy for Food Security of Chile aims to strengthen food security by coordinating and guiding state actions towards building a more resilient, inclusive and stable national food system. One of the cross-cutting aspects included in the strategy is climate change. The strategy calls for periodically promoting the participatory development of climate change mitigation and adaptation plans, as well as fostering mitigation and adaptation actions through sustainable food production, marketing and consumption practices.[241]

At the regional level, a key political body is the Community of Latin American and Caribbean States (CELAC), with the CELAC FSN Plan 2030,[****] which can serve as a regional platform to implement policies and actions that contribute to reducing the impact of climate variability and extremes on food security and nutrition.

[*] 15 countries: Antigua and Barbuda, Bahamas, Barbados, Belize, the Plurinational State of Bolivia, Brazil, Chile, Colombia, Grenada, Guatemala, Honduras, Jamaica, Saint Kitts and Nevis, Saint Lucia, and Trinidad and Tobago.
[**] 14 countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Haiti, Honduras, Panama, Paraguay, Peru and the Dominican Republic.
[***] It is worth noting that, at the subregional level, SICA also has its Regional Strategy on Climate Change (ERCC) 2024–2030. This strategy aims to contribute towards reducing human, social, ecological and economic vulnerability to climate change. It focuses on climate security with three key axes, one of which is food security and nutrition. See SICA. n.d. SICA. [Cited 24 August 2024]. https://www.sica.int/noticias/institucionalidad-regional-del-sica-articula-esfuerzos-en-materia-de-cambio-climatico_1_134172.html.
[****] See CELAC. 2024. CELAC plan for food security, nutrition and hunger eradication 2030. Santiago, FAO. https://www.fao.org/documents/card/en/c/cd0252en

Accelerated climate action can transform agrifood systems and help achieve food security and nutrition. FAO emphasizes the urgent need to transform agrifood systems, aiming not only to achieve climate goals but also to enhance food security and counter malnutrition, which is fundamental to the right to adequate food (BOX 10). To this end, FAO has developed the roadmap "Achieving SDG 2 without breaching the 1.5 °C threshold", an extensive process spanning three years, which was initiated at the United Nations Climate Change Conference 2023 (COP 28). This roadmap starts with a global vision and progresses to regional adaptation, exploring financial options, and culminates in the development of concrete investment and policy packages by COP 30. In addition, technical assistance is integrated to support sustainable investment plans and strategies. The roadmap strategically targets ten pivotal domains,[ac] and highlights 120 actions, representing areas where immediate action is imperative.[242]

[ac] The ten domains of action are: i) enabling healthy diets for all; ii) fisheries and aquaculture; iii) soil and water; iv) forest and wetlands; v) food loss and waste; vi) crops; vii) clean energy; viii) livestock and, as systemic enablers, ix) data; and x) inclusive policies.

BOX 10

RIGHT TO ADEQUATE FOOD

Climate variability and extremes can have a negative impact on the four dimensions of food security in different and related ways, heterogeneously affecting the population and their livelihoods. This situation can compromise the possibility of realizing the right to adequate food.

While the governance of food security and nutrition can be strengthened without explicit recognition of the right to adequate food in a country's regulatory frameworks, embedding this right can serve as both a foundational step and a key element in ensuring the enjoyment of other fundamental rights. The human right to adequate food is "the right to have regular, permanent and unrestricted access, either directly or by means of financial purchases, to quantitatively and qualitatively adequate and sufficient food corresponding to the cultural traditions of the people to which the consumer belongs, and which ensures a physical and mental, individual and collective, fulfilling and dignified life free of fear".[243] Therefore, the guarantee of this right is fundamental for the enjoyment of all rights. In addition, it should be noted that the interdependent relationship between the right to food and the right to the environment in the context of climate change has been recognized.[244]

Addressing climate variability requires a rights-based approach, ensuring that countries adopt inclusive and ambitious adaptation and mitigation measures that respect and protect affected communities.[245] For climate action to effectively contribute to upholding the right to adequate food, it must place rights holders at the centre, ensuring their effective contribution to its development and implementation. Rural populations, small-scale farmers and fishers, pastoralists, Indigenous Peoples, low-income households, women and girls, and children are particularly vulnerable to climate-induced food insecurity and hunger. Human rights-based measures can mitigate the negative impact of climate variability and extremes on the full realization of the right to food, while transforming agrifood systems to enhance resilience.[246]

There are various ways to achieve the legal protection of the right to adequate food, among which are constitutional protections, the promulgation of general or framework laws and the implementation of sectoral regulations.[247] In Latin America and the Caribbean, 15 countries explicitly enshrine the right to adequate food in their constitutions. [248,249,250] Currently, of these countries, nine constitutions recognize it as a universal human right,* and six constitutions explicitly recognize the right to food only for specific groups in the population.** In addition to constitutional provisions, other legal mechanisms are necessary to promote and guarantee concrete and concerted actions to ensure the realization of the right to food. The right to food is recognized in the framework laws of some countries in the region.***

Along with the recognition of the right to food, some of these laws may include key elements that link food security and climate risks. For example, the Law on Food Sovereignty and Food and Nutritional Security of Cuba promotes the implementation of measures for climate adaptation and resilience.[251] For its part, Law No 589-16 of the Dominican Republic recognizes the right to "be protected against the risk of losing access to food as a consequence of crises of any kind, including cyclical, climatic or seasonal events or other unforeseeable events".[252]

At the regional level, the Latin American Parliament (PARLATINO) has the Framework Law on the Right to Food, Food Security and Sovereignty, approved in 2012, which, among other aspects, prioritizes investing in the climate adaptation of family farming.253 Additionally, in 2021, PARLATINO approved the Model Law on Climate Change and Food Security and Nutrition254 This is the first law at the regional level that addresses the problem of climate change, while taking into account its effects on food and nutritional security.255 Currently, PARLATINO is developing the Draft Model Law for the Promotion of Agroecology. The ultimate goal of this law is the realization of the right to adequate food and food and nutritional security, while facing the challenges posed by climate change.

* the Plurinational State of Bolivia, Brazil, Cuba, Ecuador, Guyana, Haiti, Mexico, Nicaragua and Suriname
** Colombia, Costa Rica, Guatemala, Honduras, Panama and Paraguay
*** Brazil (Law No. 11,346/2006), Cuba (Law No. 148/2022), the Dominican Republic (Law No. 589/2016), Ecuador (Law No 1/2009), Guatemala (Decree No. 32/2005), Honduras (Decree No. 25/2011), Mexico (2024), Mexico (Mexico City) (2009), Nicaragua (Law No. 693/2009), Peru (Law No. 31315/2021), the Bolivarian Republic of Venezuela (Decree Law No. 6,071/2008) - for more details, see FAOLEX Database https://www.fao.org/faolex/en/

Agrifood systems need to enhance resilience against the impacts of present and future climate variability and extremes by adopting effective strategies and policies for transformative adaptation.[256] With the aim of addressing the growing impacts of climate variability and extremes on food insecurity and malnutrition, the following sections present relevant policies and interventions that are being implemented in countries of the region, and provide specific recommendations for building more climate resilient agrifood systems. Due to the increase in frequency and intensity of climate variability and extremes, as well as other major drivers, and their recurrent combination with the underlying factors, additional measures are required to address these compounded challenges and prevent exacerbating food insecurity and malnutrition. These measures include reducing the cost of nutritious foods that are part of healthy diets along agrifood supply chains, shifting towards healthy food environments and reducing inequality. Certainly, depending on the drivers facing a country, there are several possible pathways.[ad]

The sustainable supply of food for the entire population at all times is the primary mission of agrifood systems, which is why the path toward achieving this goal is inseparably intertwined with solid climate actions and resilience building.[257] Therefore, the three elements of agrifood systems (food supply chains, food environments and consumer behaviour) need policies to strengthen resilience. The interaction among these elements is crucial for delivering accessible and affordable healthy diets. This interaction significantly influences agrifood systems outcomes, such as food security and nutrition (as well as environmental sustainability, which also impacts climate

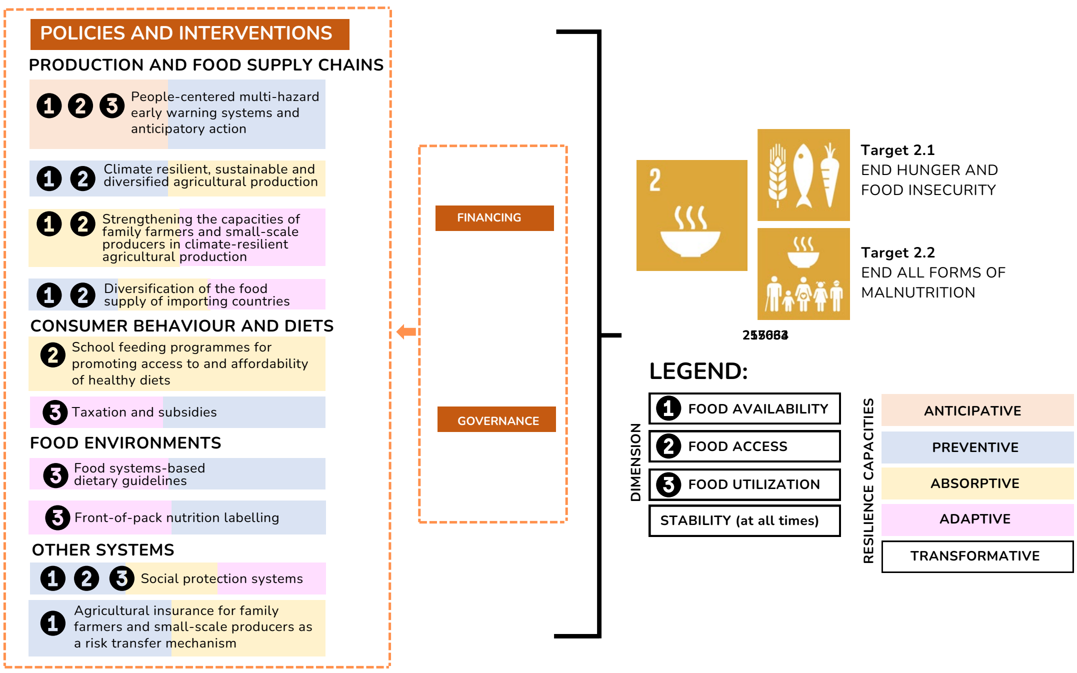
[ad] Reducing the cost of nutritious foods that are part of healthy diets along agrifood supply chains, shifting towards healthy food environments and reducing inequality are three of the transformative pathways of policies, investments and legislation recommended to address the structural underlying factors. To check all the six transformative pathways, please see FAO, IFAD, UNICEF, WFP and WHO. 2024. The State of Food Security and Nutrition in the World 2024 – Financing to end hunger, food insecurity and malnutrition in all its forms. Rome. https://doi.org/10.4060/cd1254en

outcomes).[258] In addition, it is essential to create synergies with other systems that support agrifood systems and, through specific policies and interventions, contribute toward developing resilient agrifood systems for food security and nutrition (FIGURE 44).

To keep agrifood systems at the centre, the analysis of the policies and interventions that can significantly contribute to strengthening climate resilience to ensure food security and nutrition is divided into four groups: food supply chains, food environments, consumer behaviour and diets, and other systems. While other systems such as water, sanitation and hygiene, as well as health systems, are essential for food security and nutrition in the context of climate variability and extremes,[259] this report focuses on social protection systems and agricultural insurance as a risk transfer mechanism. This focus is due to the urgent need to reduce inequality and build resilience capacities in populations in vulnerable conditions that are more exposed to adverse climate impacts, such as family farmers and small-scale producers.[ae]

FIGURE 44 highlights how examples of these policies and interventions, which are being implemented in Latin America and the Caribbean, can contribute to enhancing resilience capacities and addressing the various dimensions of food security. These elements ensure coordinated, transparent and sustained efforts, enabling the development of resilient agrifood systems and, ultimately, the achievement of SDG 2.

FIGURE 44
Policies and interventions outlined in this report to enhance the resilience of agrifood systems for improving food security and nutrition



Source: Authors' own elaboration

[ae] There are additional measures to support populations in the most vulnerable situations such as anticipatory action and early-warning systems (CHAPTER 7.1), risk financing instruments and payments for ecosystem services, among others.

This report aims to share some of the experiences where capacities are being built in the region to anticipate, prevent and adapt agrifood systems to climate variability and extremes, while also contributing to food security and nutrition. However, there are evidence gaps regarding policies and investments that can reduce the impacts of climate variability and extremes on food security and nutrition indicators. Future research should focus on exploring the interconnections among key interventions within the agrifood system and their impacts on food security and nutrition, as well as climate outcomes. This integrated and evidence-based information will facilitate the transition to more resilient and sustainable agrifood systems and help identify the challenges and opportunities that may arise.

7.1 INTERVENTIONS TO REDUCE THE IMPACTS OF CLIMATE VARIABILITY AND EXTREMES ON PRODUCTION AND FOOD SUPPLY CHAINS

Production, food supply chains and the livelihoods of actors in agrifood systems are increasingly disrupted by several drivers such as climate variability and extremes. Climate resilient food supply chains ensure a stable and reliable flow of food from producers to consumers, even in the face of disruptions, thereby contributing to protect food security and nutrition. Production and food supply chains are an important source of employment, particularly for family farmers, small-scale producers and entrepreneurs, and their resilience to climate changes contributes to safeguarding incomes and livelihoods. Well-functioning supply chains can provide reliable markets for small-scale farmers and other food supply chain actors such as MSMEs, ensure price stability, and promote sustainable agricultural and good manufacturing practices while protecting vulnerable livelihoods. In terms of food security, supply and value chains mainly contribute to the dimensions of food availability and access.

In Latin America and the Caribbean there are interventions in production and food supply chains that deserve to be highlighted as good practices for reducing the impact of climate variability and extremes on food security and nutrition. Among these strategies are people-centred multi-hazard early-warning systems and anticipatory action, climate-resilient, sustainable and diversified agricultural production systems, strengthening capacities in climate-resilient practices, restoration of productive resources, and diversification of the food supply of importing countries. These interventions can influence the development of national policies aimed at sustaining and scaling up their coverage and results.

A. People-centred multi-hazard early-warning systems and anticipatory action

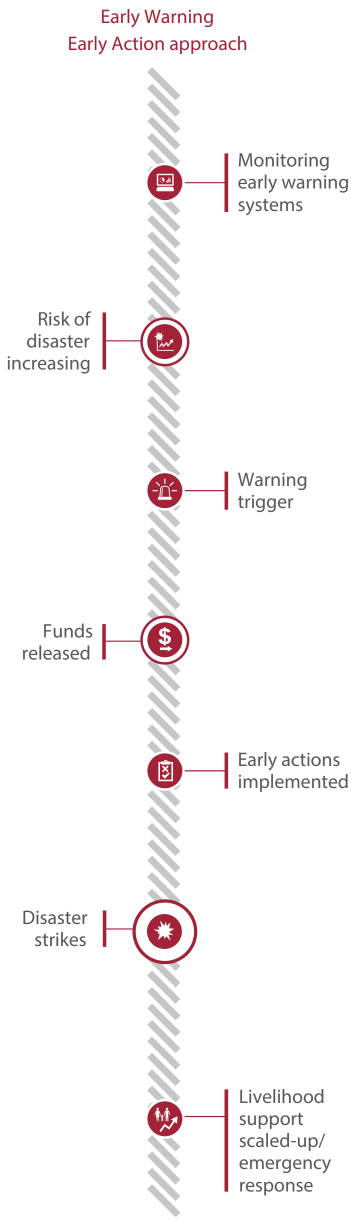
Early-warning systems (EWS) are essential for anticipatory action and preparedness response, which complement the efforts to prevent risks through the adaptation and transformation of agrifood systems.[260]

An EWS is an integrated system for threat monitoring, forecasting and predicting, as well as for disaster risk assessment, communication, and preparedness activities, systems and processes. It enables individuals, communities, governments, businesses and other stakeholders to take timely actions and implement strategies to mitigate imminent impacts, while guaranteeing food security and nutrition.[261] In the context of risk management within agrifood systems, an EWS addresses specific risks and helps to establish what these risks are, how the determining variables interact and their effects on people based on multiple dimensions of vulnerability. These risks include those impacting the dimensions of food security or livelihoods.[262, 263]

An EWS adopts measures and collects data on the imminent impacts on agrifood systems to define long-term strategies aimed at reducing risks, including adaptation to climate variability and extremes, as well as transforming agrifood systems to build resilience and sustainability. By providing information on the nature and behaviour of the variables that determine risks, it enables the initiation of actions to manage evolving situations, which increases preparedness capacity and triggers early actions to prevent the adverse effects (**FIGURE 45**).[264]

An effective, people-centred EWS is built upon the interrelationship of four components: i) risk knowledge; ii) detection, monitoring and forecasting; iii) alert dissemination and communication; and iv) capacity to act upon alerts and prepare the response.[265] This approach helps maintain local food production and ensures access to nutritious foods that are part of healthy diets, thereby protecting critical elements of the agrifood system and the livelihoods that sustain food security. Evidence shows that providing support to vulnerable communities before shocks occur has a positive impact on food security and nutrition, preventing negative coping strategies that could lead to extreme poverty and hunger.[266, 267]

FIGURE 45
Early-warning systems and anticipatory actions are key mechanisms to reduce disaster risk and promote climate adaptation



Source: FAO. 2021. Colombia: The effects of Early Warning and Action. Rome, FAO.

Meteorological services are particularly relevant for monitoring risk in agrifood systems. They track hydroclimatic threats that can cause major disruption to agriculture, livestock, forestry, fishing and aquaculture. Additionally, it is essential to understand the potential effect on the dimensions of food security. [268] EWSs are responsible for monitoring and detecting various risks, such as flooding, drought, heat waves and storms.

BOX 11 highlights the main function of FAO's Global Information and Early Warning System on Food and Agriculture (GIEWS) in the agrifood sector, which is to continuously monitor priority threats across various risks and sectors. It is important to consider that threats have different impacts depending on the subsector. Therefore, thresholds for activating alerts must be clear, specific and established in advance, based on risk assessment and their potential consequences in each agrifood area and subsector. Identifying the right moment is crucial for anticipatory action, and understanding windows of opportunity is essential.

BOX 11

INFORMATION ON FOOD SUPPLY AND DEMAND ACROSS THE WORLD

Established in response to the food crises of the 1970s, FAO's Global Information and Early Warning System on Food and Agriculture (GIEWS)[*] is a leading source of information on food production and food security at the national, regional and global levels.[269] Its main mission is to continuously monitor food supply and demand, as well as other key indicators for assessing the current food security situation in all countries of the world. Through assessments and reports, GIEWS alerts national and international decision makers on impending food crises, aiming to guide their interventions. GIEWS provides comprehensive market intelligence on agricultural commodities and supports national and regional initiatives to establish and enhance EWS.

The system monitors the growing condition of major food crops across the globe to assess production prospects. To support analysis and supplement ground-based information, GIEWS utilizes remote sensing data that can provide valuable insight into water availability and vegetation health during cropping seasons. In 2014, GIEWS developed the Agricultural Stress Index (ASI),[**] a quick-look indicator for early identification of agricultural areas affected by water deficits or, in extreme cases, drought.

The GIEWS crop production forecasts and analyses of market and food security conditions are brought together in the Crop Prospects and Food Situation report,[***] which is published three times per year. The report provides decision makers with comprehensive forward-looking analysis, assessing the impact on agriculture and food security of a multitude of factors, ranging from weather to disease outbreaks, conflicts and policies. Moreover, the report draws attention to countries affected by high levels of food insecurity and issues warnings related to countries with unfavourable harvest expectations. For example, in early November 2023, GIEWS predicted that the 2024 corn plantations in South America would decrease compared to the maximums of the previous year, mainly due to less favourable meteorological conditions.[270]

In collaboration with the World Food Programme (WFP), GIEWS carries out crop and food security assessment missions. These missions, conducted around the world, are rapid assessments that provide an accurate picture of existing or anticipated food security crises, driving government and international actions to mitigate the effects on local populations.[271]

After the 2007–2008 food price crisis, GIEWS established an online Food Price Monitoring Analysis (FPMA) tool**** covering staple food prices in around 125 countries and international benchmark trade prices. The FPMA tool supports the GIEWS regular analysis of food price trends at the national and global levels, and the data contributes to measuring the progress towards SDG 2. GIEWS also supports the national and regional implementation of the FPMA tool to strengthen market information systems for better decisions at the country and regional level.

*See FAO. n.d. GIEWS - Global Information and Early Warning System on Food and Agriculture. In: FAO. [Accessed July 24 2024]. https://www.fao.org/giews/en/
**See FAO. n.d. Earth Observation. In: FAO. [Accessed July 24 2024]. https://www.fao.org/giews/earthobservation/asis/index_1.jsp?lang=en
***See FAO. n.d. Crop Prospects and Food Situation. In: FAO. [Accessed July 24 2024]. https://www.fao.org/giews/reports/crop-prospects/en/
****See FAO. n.d. Food Price Monitoring and Analysis. In: FAO. [Accessed July 24 2024]. https://www.fao.org/giews/food-prices/home/en/

For example, forecasting the occurrence of drought due to the El Niño phenomenon in the Central American Dry Corridor allows preventive measures to be taken in the face of potential food crises, thereby reducing agricultural losses, increasing food availability and promoting food security.[272] Actions were carried out benefiting 7 500 small-scale producers, women, youth and Indigenous Peoples. These actions improve water collection and storage capacities and strengthen local institutions in risk and drought management.[273] Every dollar invested in anticipatory actions can generate a return of up to USD 7, while strengthening the long-term resilience of households.[274]

Paraguay has supported anticipatory actions in departments prone to flooding and drought. These actions, which include the provision of inputs, seek to ensure that small-scale producers, women, Indigenous Peoples and youth have access to rainwater storage systems and generate reports on vulnerable areas,[275] with the aim of ensuring food availability during climate variability and extremes. In Guatemala, the PRO-Resilience Programme (2020–2025) has established anticipatory measures to mitigate the impact of drought by piloting anticipatory actions, allowing 6 000 people to benefit from training, cash-based transfers and resources such as drought-tolerant seeds.[276] Similarly, Colombia addresses frost in the Andean region through a package of recommendations from the Ministry of Agriculture and Rural Development. This includes adjusting the sowing calendar so that the crops are in the germination phase during the critical frost period, which is the most resistant phase to this meteorological phenomenon, thus avoiding frost during the flowering or harvest period.[277]

The Competitiveness and Sustainable Rural Development Project in the south-western border corridor in Honduras, with a network of 30 basic weather stations across three departments, enables each beneficiary organization to obtain local climate information on a daily or weekly basis. The stations have generated meteorological data, measuring variables such as temperature, precipitation, humidity, dew point, wind direction and wind speed for decision making at the local level. This has allowed for real-time statistics that served as an EWS source for small-scale producers, helping them adjust planting schedules, manage water resources more effectively and select climate-resilient crops.[278]

Another example of an anticipatory action is planting short-cycle crops, such as leafy greens, radishes and carrots, in drought-prone areas. These crops reach maturity before drought strikes, ensuring a successful harvest. On the other hand, in flood-prone regions, planting on elevated lands or terraces emerges as a protective strategy. A notable example is seen in the valleys of Cusco and Puno in Peru, where the terrace system facilitates the cultivation of various traditional varieties of potatoes and quinoa, thereby diversifying risk and improving soil quality.[279]

The use of participatory tools contributes to developing risk analyses in agricultural production and livelihoods. For instance, participatory agroclimatic information systems, also known as agroclimatic technical roundtables, are a relatively recent innovation within EWS. By regularly convening working groups (that include meteorologists, agronomists, veterinarians, land specialists, producer representatives and local authorities, among others) meteorological information is interpreted in terms of its implications for various agricultural and livestock activities potentially affected by climate-related phenomena. The results of these discussions are reflected in agroclimatic bulletins with actionable recommendations.[280] For example, agroclimatic bulletins in Colombia and Mexico periodically offer an analysis of climatic behaviour at the subnational level and provide understandable recommendations for decision making and for planning agricultural and livestock activities.[281, 282]

In addition, in Colombia, the implementation of EWS has strengthened food security and social cohesion, especially on the front lines of the migration crisis.[283] Through the early warning and action project, 1 003 vulnerable households in five municipalities in the department of La Guajira were supported,[af] which contributed to increased local food production and the protection of household assets, including the establishment of community gardens, distribution of seeds and tools, animal health assistance,[ag] and rehabilitation of water infrastructure. The results showed an increase in the diversity of foods consumed, the prevention of a reduction in the number of daily meals, avoidance of economic losses amounting to USD 1 351,[ah] and improvements in community relations.

There are opportunities to improve EWS, either by optimizing existing systems or implementing new ones, while taking advantage of the surveillance capabilities of countries and communities.[284, 285] Establishing an effective connection between EWS and anticipatory actions is essential for monitoring and addressing the impacts of extreme climate events on agriculture and food security and nutrition.[286]

[af] These municipalities are: Riohacha, Manaure, Albania, Maicao and Uribia.

[ag] Such as vaccination of livestock, treatment of sick animals and administration of vitamins.

[ah] USD 261 in crops and USD 1 090 in livestock.

The challenges in implementing these mechanisms include the need for flexible operational systems that can scale up access to financial resources that can be rapidly mobilized, as well as effective coordination across sectors, including social protection[287] and agricultural insurance[288,289] for family farmers and small-scale producers (CHAPTER 7.4) to ensure timely and relevant actions, along with interoperable platforms for data sharing across sectors, including food security and nutrition indicators.

In a context of increasing frequency and intensity of climate variability and extremes, the effectiveness of this strategy crucially depends on having accurate and up-to-date climate information, which can represent a challenge in some parts of Latin America and the Caribbean due to the limited coverage of meteorological services.[290] It is vital that climate information is easily accessible and free for small-scale producers and family farmers,[291] involving coordination with digital infrastructure policies in rural areas.

To provide stronger evidence for policymakers and other stakeholders, it would be beneficial to have more long-term studies and data analysing the sustained impact of EWS and anticipatory actions on food security and nutrition indicators over extended periods, and how these systems lead to improvements in nutritional outcomes. Additionally, more evidence on how these systems can be scaled up and replicated in different regions or under varying climatic conditions, along with more detailed cost-benefit analysis, would be valuable. Furthermore, evidence on the integration and coordination among different sectors (such as agriculture, health, environment and climate actions) in implementing EWS would help in understanding the holistic approach needed for resilience building in agrifood systems.

B. Climate resilient, sustainable and diversified agricultural production

Sustainable, resilient and diversified production systems are less vulnerable to climate variability and extremes. They can withstand hazards such as drought, flooding, or pests that may affect specific crops, livestock, aquaculture, fisheries or specific regions, ensuring a more stable and nutritionally diverse food supply, while contributing to healthy ecosystems. Sustainable and diversified climate-resilient production must include: i) diversification of crops and biodiversity for climate resilience; ii) cultivation and conservation of marginalized and underutilized crop species; iii) agroforestry systems for food security; iv) agrosilvopastoral systems; v) better aquaculture and fisheries practices; vi) climate adapted livestock; vii) integrated pest management; viii) sustainable soil and water management; ix) responsible use of pesticides, fertilizers and bio inputs; and x) forest and agrobiodiversity restoration, conservation and sustainable use. In the upcoming section, a comprehensive examination of the first three will be provided.

i) Diversification of crops for climate resilience

Transforming agrifood systems means promoting and strengthening the nexus between forest, biodiversity, soil and water. In the context of the increasing frequency and intensity of climate variability and extremes, there is a critical need to develop agroecosystems that are resilient to these shocks to ensure food security and nutrition and to contribute to healthy diets. Diversity in the field creates resilience against climatic shocks and contributes to healthy diets.

When farmers are forced to adjust their traditional production practices due to the impacts of climate variability, the introduction of new alternatives (crops, knowledge technologies and innovation) becomes an essential measure.[292] The application of agroecology, restorative and conservation agriculture and other sustainable approaches, in addition to diversified crops adapted to climate variability and improving agricultural productivity, have the potential to reduce production costs and losses, improve the quality and variety of available food for consumption and reduce vulnerability to extreme climate events. To develop crops and varieties capable of resisting future changes in environmental conditions, it is necessary to rescue, produce and conserve seeds of relevant traditional crops, crop relatives and wild species, establish native pastures with quality parameters, in addition to strengthening local seed production and certification systems. Furthermore, it is also essential to increase investment in the exchange of germplasm and seeds between ecologically homogeneous areas and the improvement of crops for tolerance traits to pests and diseases.[293] In addition, it is key to promote options for sustainable and resource-efficient agriculture, aquaculture and fisheries production systems.

Loss of agricultural biodiversity reduces the capacity to address future challenges, including those posed by a changing climate.[294] Biodiversity[ai] is essential for diversification and adaptation of crops to meet the pressures of climate variability and extremes in agriculture and for food security and nutrition. Furthermore, biodiversity is an important driver for enhancing the resilience of small-scale producers and family farmers to climate extremes, and pest and disease outbreaks, among others. [295] The introduction of alternative crops and adaptative practices can improve agricultural productivity, lower production costs, and increase food diversity, while positively impacting the quality of producers' lives by reducing their vulnerability to climate risks.

In the Plurinational State of Bolivia and Ecuador, the development of improved lupine[aj] crop management techniques included determining the optimal seeding density and creating a rhizobia inoculum for lupine seeds to facilitate nitrogen fixation from the air.[296] These technological innovations not only increased the economic and environmental benefits for producers, but also strengthened their capacity to address challenges related to climate variability and food security by reducing the use of fertilizers (which leads to lower levels of emissions).

In Mexico, the Mexican agrobiodiversity project, with scope at the national, regional and local level, supported 9 781 peasant producers to maintain their traditional agroecosystems and conserve native varieties[ak] and wild relatives[al] of crops, and supported them in promoting traditional practices (*milpa*, gardens and orchards) and

[ai] Biodiversity or biological diversity means the variability among living organisms from all sources including, among other things, terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (United Nations Convention on Biological Diversity, 1992). See IPCC. 2022. Annex II: Glossary In: V. Möller, R. van Diemen, J.B.R. Matthews, C. Méndez, S. Semenov, J.S. Fuglestvedt, A. Reisinger, eds., Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, pp. 2897–2930. Cambridge UK and New York, USA, Cambridge University Press. https://doi.org/10.1017/9781009325844.0299

[aj] As a legume known for its ability to adapt to adverse climate and soil conditions, lupine is an important source of plant protein, iron and zinc, thus contributing to food security and nutrition.

[ak] For more information on the species included in agrobiodiversity, see: https://siagro.conabio.gob.mx/#especiesNav/

[al] Including plants that have grown freely (without human intervention) and those that are closely related to cultivated species because they have helped make crops more resistant to pests and diseases. https://www.biodiversidad.gob.mx/diversidad/proyectos/agrobiodiversidadmx

agroecological pest management, while strengthening or establishing community or family seed banks, seed exchange networks and germplasm banks in 66 communities.[297]

Furthermore, Indigenous Peoples play an important role in ensuring food availability during climate extremes, making it essential to integrate their knowledge into broader strategies for climate resilience and food security. However, they often face significant challenges, such as limited access to resources and vulnerable ecosystems (BOX 12).

In the Plurinational State of Bolivia, the project "Conservation and sustainable use of agrobiodiversity to improve human nutrition in five macro-regions" has played a crucial role in generating knowledge, promoting good practices, strengthening capacities and advocating for effective public policies.[298] This Global Environment Facility (GEF) supported project has contributed to the food security and nutrition of Indigenous Peoples and peasant communities by offering food options with high nutritional value, such as fruits,[am] Amazonian fruits,[an] Andean grains,[ao] tubers and roots[ap] through the in situ conservation of agrobiodiversity and its sustainable use. It has also generated additional benefits, such as the proposal of the National Programme for Sustainable Management of Agrobiodiversity 2022–2027, support for the adaptation of technical standards for agrobiodiversity products and the recovery of Indigenous knowledge and practices related to crops, forest products and traditional foods. In a series of cases, family income was increased due to this project. These efforts could guarantee the continuity of the achievements obtained by the project, laying the foundations for the sustainable management and use of agrobiodiversity in the country.[299]

In Brazil, the Rural Sustainable Development Project in the semi-arid region of Bahia has supported the implementation of seed banks and capacity-building of 420 seed guardians, a role predominantly undertaken by women and ethnic minorities. These guardians use their traditional knowledge to preserve, conserve and restore biodiversity by collecting hundreds of varieties of local species that are more resistant to the effects of climate change. This initiative, known as the Creole Seed Programme, involved the identification of seed guardians, the development of agrobiodiversity diagnosis, and the establishment of community seed houses and nurseries for propagating species facing genetic erosion. The programme provided access to a wide range of different climate-adapted seeds for producers, enabling them to produce food in line with their food cultural heritage. As a result, the project increased the availability of seeds for food and forage production, diversified agricultural production, stabilized income and increased agrobiodiversity. To date, the Creole Seed Programme has benefited 1 000 families, enabling them and other households in the region to access a healthy diet and to secure a stable income.[300]

[am] Apple, peach, avocado and custard apple.
[an] Chestnut, acai, copoazú and majo.
[ao] Quinoa, cañihua, Andean lupin and amaranth.
[ap] Native and commercial varieties of potatoes and cassava.

BOX 12

THE CHALLENGES FACED BY INDIGENOUS PEOPLES IN ENSURING FOOD AVAILABILITY DURING CLIMATE EXTREMES

In a context of climate variability and extremes, the agrifood systems of Indigenous Peoples are probably among the best placed to provide insights, lessons and evidence that could be key in the transition towards more sustainable agrifood systems, to maintain food production at relatively constant levels when faced with these climate events.[301]

Indigenous Peoples located in rural areas depend on natural resources for their subsistence and often inhabit diverse but fragile ecosystems. At the same time, Indigenous Peoples are among the most vulnerable populations in the world. Therefore, while Indigenous Peoples located in rural areas suffer the consequences of climate variability and extremes, they have minimal access to resources to cope with these events. [302]

To understand the impacts caused by climate variability and extremes on Indigenous Peoples, it is important to note three key characteristics: i) population density in rural areas; ii) the size and biological richness of their territories; and iii) ancestral knowledge, which favours the sustainable management of natural resources.[303] A series of experiences of intercultural collaboration show how these elements can be used in favour of mitigating the effects of these events on elements such as food production.

In La Guajira province, which is on the border between Colombia and the Bolivarian Republic of Venezuela, the aridity of the land combined with increasing extreme weather events have generated a series of adverse conditions for the Wayuú People in terms of farming and raising livestock. Based on a rapid assessment of the situation by the FAO Early Warning Early Action team, in conjunction with the FAO Colombia office and other sources of information, the government launched projects and programmes aimed at boosting food production and improving water resources management. The installation of water supply infrastructure, both for human consumption and agricultural production, the recovery and rehabilitation of community-based production systems with an agroclimatic risk focus, and the strengthening of technical capacity were among the main actions taken to increase the resilience of this community and boost agricultural production.[304]

To address risks and generate development plans, it is important to integrate the knowledge of Indigenous Peoples, since, together with local knowledge, they play a key role in the adaptation and resilience of agrifood systems.[305] In Colombia, a fishing agreement has been forged inspired by the traditional governance systems of the Indigenous Peoples, specifically the Tikunas, Cocamas and Yaguas, who reside near Lake Tarapoto. These Indigenous Peoples, with centuries of experience, have developed agrifood systems adapted to a unique forest flood ecosystem. In addition, a community fishing agreement was implemented, complemented by an educational programme aimed at Indigenous youth, with the purpose of revitalizing sustainable fishing practices.

In Brazil, the Rural Sustainable Development Project in the semi-arid region developed a strategic alliance with Slow Food, which supported promoting Bahia's food heritage and sociobiodiversity products, particularly valuing the Traditional Agrifood Systems of Indigenous Peoples and Common Grassland communities.[306] The project Empowering Indigenous Youth and their Communities to Defend and Promote their Food Heritage brought new income alternatives for young Kiriri people by promoting manioc production, with the general objective of improving local livelihoods, protecting and promoting food heritage, and maintaining the sustainability of the Indigenous practices of the Kiriri of Banzaê.[307]

ii) Cultivation and conservation of neglected and underutilized crop species

Neglected and underutilized species, often referred to as orphan crops, represent a diverse array of plant genetic resources, which include cultivated, semi-domesticated or wild plants, are typically overlooked in favour of major staple crops and are not treated as commercial commodities.[308,309] The cultivation and conservation of neglected and underutilized crop species not only enriches biodiversity but can also help contribute to increasing food security and nutrition (through dietary diversity), income and climate resilience. The responsible production and management of these foods promotes environmental sustainability and improves the livelihoods of collectors and collaborators along value chains.[310] For Indigenous Peoples, Afro-descendants and people in vulnerable situations, wild foods and those from the forest are essential during periods of scarcity. Furthermore, marginalized and underutilized crop species are emerging as valuable sources of vitamins, minerals, dietary fibre and other essential nutrients.

In Paraguay, through a project[aq] to collect ethnobotanical information and understand the eating habits of the Énxet, Indigenous Peoples in the Central Chaco, 67 food species and 32 types of wild fruits were identified, including 14 varieties of prickly pears.[311] The meat consumed comes mostly from the mountains and includes various species of birds and animals. Characterizing the food traditions and nutritional composition of neglected and underutilized crop species not only provides a deeper understanding of dietary habits, it also establishes the basis for the development of policies that support the production and consumption of these foods. In a context of changes in food preferences due to external influences,[312] deepening the knowledge and traditions of Indigenous Peoples is essential to facilitate sustainable changes towards healthier diets.[313]

In Chile, the GEF project Nationally Important Agricultural Heritage Systems[ar] focused on recovering, conserving, and making visible agricultural heritage and agrobiodiversity, but at the same time the nutritional composition of neglected and underutilized crop species was characterized to promote the consumption of these

[aq] "Chaco Rapére: protecting and adapting livelihoods to face drought in vulnerable indigenous communities of the Paraguayan Chaco" by the Directorate-General of European Civil Protection and Humanitarian Aid Operations (ECHO) of the European Commission.
[ar] See https://sipan.minagri.gob.cl/

nutritious foods, such as quinoa and tomatoes, and strengthen the marketing capacity of producers in two macrozones of the country. Among the results of the project is the establishment of nine traditional seed plots, mainly led by women, which have enabled the conservation and reproduction of 34 traditional varieties of maize, beans, quinoa and tomatoes, among others.[314]

At the regional level, the Latin American Food Composition Network (LATINFOODS)[as] plays a crucial role in developing, strengthening and disseminating information on the composition of neglected and underutilized crop species in the region. From quinoa (with a high density of protein, fibre and iron) to arepas (a type of flatbread made from ground maize [corn] dough or flour), LATINFOODS provides nutritional composition tables by country, training manuals and publications, thus promoting the understanding of the composition of locally consumed foods and reducing dependence on sources outside the region.

iii) Agroforestry systems for biodiversity and food diversity

Agroforestry systems, which integrate trees, crops and/or livestock, provide a series of substantial benefits for producers. The resilience of these systems to extreme climate events exceeds that of conventional agricultural systems.

In agroforestry systems, besides providing certain products, trees also provide ecosystems services for crops like soil and water protection and shade and fodder for animals, as well as mitigating temperature and drought impacts. In this way production is more resilient, sustainable and diverse. By providing ecosystems services like soil and water protection and providing agricultural products they also serve to restore degraded lands. While traditional agroforestry systems exist, it is important to recognize that farmers may face obstacles to adopting new agricultural agroforestry practices, such as a lack of information, limited access to financial resources or resistance to change.

These systems not only positively impact the quality of life of producers by providing wood, fruits, fodder, and other products that can generate income or improve their diet, they also represent an effective strategy to address the challenges associated with climate variability. A notable example is the Kuxur Rum programme implemented in Guatemala. This agroforestry system combines agricultural production with the restoration of the forest landscape in regions with variable rainfall, allowing firewood, wood and grains to be obtained from the same plot of land. It has demonstrated positive impacts on food security and nutrition by significantly increasing corn[at] and bean[au] production, while improving drought resistance and soil moisture retention. [315]

Cuba is implementing the Green Climate Fund project "Increasing the climate resilience of rural families and communities through the rehabilitation of productive territories", which is oriented towards making the country's agriculture sector more inclusive, sustainable and resilient to the effects of climate change. As a small island developing state, Cuba is especially vulnerable to climate extremes. The project, with a total investment of USD 119.9 million, has the potential to promote more

[as] See Latinfoods food composition portal https://www.latinfoodsportal.net/latinfoods.php
[at] Corn production can increase by up to 55 percent, which translates into an increase of 4.5 months of grain reserves.
[au] Bean production can increase by up to 4 percent, which translates into an increase of 2.5 months of reserves.

climate-resilient agricultural production of rice and beans in seven municipalities vulnerable to climate shocks. The introduction of agroforestry practices in an area covering 35 000 hectares will reduce GHG emissions, avoiding the emission of 2.7 million tonnes of these gases through production techniques, agroforestry (including silvopastoral systems), reforestation and assisted natural regeneration of forests.[316] Also, the restoration of productive territories and the preservation of ecosystem services will provide multiple benefits to both people and the environment. Approximately 52 000 family farmers will benefit from increased food security, improved access to water, employment opportunities and strengthened local food production systems. In addition, an estimated 300 000 people will benefit from greater food security through improved ecosystem services and increased climate resilience of agricultural production.[av]

Also in Cuba, the Agroforestry Cooperative Development Project (PRODECAFE), introduced agricultural practices and strategies within agroforestry systems to reduce vulnerability to climate variability and external shocks. Key outcomes include the rehabilitation and renewal of 523 hectares of shaded coffee systems with healthier plant species, the production of 1.6 million seedlings as part of the renovation process, the implementation of soil conservation and improvement measures across 3 550 hectares of shade coffee plantation and 51.7 km of firebreaks were rehabilitated to mitigate forest fires risks. PRODECAFE also promoted diversification in food production, increasing the production of roots, tubers and vegetables that improved access to diversified foods at the community level.[317]

Scaling up agroforestry practices across Latin America and the Caribbean region requires addressing several key challenges, including: the need for upfront investment, as many benefits only emerge in the medium to long term, comprehensive training and capacity-building programmes to enhance human capital and organizational capacities, policies that incentivize sustainable agroforestry practices, while acknowledging the environmental and social benefits these systems provide, investments in market development, public–private partnership and monitoring systems that track environmental, social and economic outcomes.[318, 319, 320]

Agroforestry systems represent a comprehensive solution for agriculture and climate resilience, offering significant benefits to producers and communities. Their ability to protect crops, enhance productivity, and preserve natural resources makes them an effective strategy for addressing the impacts of climate variability and extremes on food security and nutrition through reducing biodiversity loss and increasing food diversity. These systems not only contribute to food availability, they also reduce climate risk for agrifood systems and promote sustainability.[321]

C. Strengthening the capacities of family farmers and small-scale producers in climate-resilient agricultural production

Family farmers and small-scale producers play an essential role in food production and in maintaining the connection between consumers and food production.[322] However, as mentioned in previous sections, they are among the population groups

[av] See Green Climate Fund. n.d. FP126: Increased climate resilience of rural households and communities through the rehabilitation of production landscapes in selected localites of the Republic of Cuba (IRES). In: Green Climate Fund. [Accessed August 10 2024]. https://www.greenclimate.fund/project/fp126

that face greater vulnerability to a changing climate, both as consumers and suppliers. Strengthening the capacities of family farmers and small-scale producers helps them be better prepared to face climate variability and extremes, as well as enhancing their resilience while reducing the impacts on food production (and, therefore, on food security and nutrition). By improving their climate resilience, these producers can maintain stable incomes and livelihoods, particularly in regions more exposed and vulnerable to climate conditions, which could translate into stability of food consumption.

It is worth noting that the solutions for family farmers and small-scale producers vary across different locations and priorities,[aw] as do capacities and assets for climate resilience to facilitate sustainable development.

Capacity development can be focused on different topics and disciplines, such as training in climate-smart agriculture, agroecology, the sustainable use and management of natural resources, and irrigation and planting techniques. It can also be aimed at developing capacities for crop rotation planning and pest and disease management, as well as sustainable fishing and aquaculture. In addition, it is important to adapt technological solutions to the different realities of family farmers and small-scale producers, given that new technologies are generally adopted by people with a higher level of education, knowledge, skills or with greater access to financing.[323]

In Latin America and the Caribbean, some countries have implemented Farmer Field Schools (FFSs),[324] through which climate resilient techniques are promoted. In 2020, the operation of the FFS[325] began in Panama with an emphasis on practices related to sustainable agriculture adapted to the climate in rice production.[ax] As of December 2021, 350 people, including Panamanian producers and technicians, had benefited from the 15 FFSs that were carried out in different rice-producing areas of the country. An improvement in profitability was also evident due to increased performance and lower production costs thanks to alternative production methods.[326] In addition, the Nationally Appropriate Mitigation Actions (NAMAs)[ay] for rice were presented for registration with the NAMA Facility as part of Panama's nationally determined contributions (NDCs) to the reduction of GHGs.[327]

For its part, Nicaragua implemented the Agriadapta project. Agriadapta benefitted 11 661 families, of which 63 percent were represented by women and 45 percent by young people from 110 communities of ten municipalities in the Dry Corridor of Nicaragua. Agriadapta contributed to obtaining triple impact results: strengthening of livelihoods, the implementation of climate change adaptation measures, and positive impacts on the different dimensions of food security and nutrition of the participating communities. Production systems have been promoted to meet the nutritional

[aw] For example, connecting family farmers to institutional demand through public local procurement mechanisms, such as those for school feeding programmes (CHAPTER 7.2), hospitals, prisons, etc.

[ax] In El Salvador, FFS were also implemented, focused on sustainable livestock practices. See https://www.euroclima.org/noticias-y-eventos6/noticias-9/174-mitigacion-en-la-agricultura/1482-con-exito-el-salvador-y-panama-cierran-proyecto-apoyo-a-la-formulacion-de-acciones-apropiadas-de-mitigacion-en-la-agricultura-centroamericana

[ay] NAMAs are policies, regulations, programmes or other types of voluntary actions carried out by countries to reduce GHG emissions. Each NAMA is proposed in accordance with the specific capabilities of each country and must be aligned with national and sectoral policies and generate co-benefits.

needs of families that are affected by the decrease in their income and, at the same time, promote the use of land in accordance with its potential by establishing 4 267 orchards and 692 agroforestry plantations.[328] In Guatemala, the PRO-Resilience Programme (2020–2025) strengthened the use of climate information by training 8 275 producers on climate services, which allows them to adapt their agricultural practices to changing conditions.[329]

In Brazil, the Rural Sustainable Development Project in the semi-arid region of Bahia was impacted by a prolonged drought. As a result, water management became crucial, leading to the implementation of diverse water production infrastructure projects, including runoff cisterns, ditches and fusegate technology. Fusegate is a structure that increases a reservoir's capacity when installed on top of a dam wall. The dam provided water for irrigation, which led to the recovery of the productive capacity of the irrigated communities. This not only increased production, it also diversified their agricultural production thanks to the improved water availability. Additionally, the dam now provides safe drinking water to 224 000 people, significantly contributing to better nutritional outcomes.[330]

In addition, these interventions have contributed to greater gender equality. For instance, in Brazil, the Rural Sustainable Development Project in the semi-arid region recognized that the practices of small-scale producers are becoming increasingly challenging in the context of climate variability and extremes, often adding to the already heavy workload of women. This increases women's need for a nutritious diet, while reducing their time for caregiving activities, including preparing healthy meals. The project expanded women's access and control over fundamental tangible and intangible assets and resources, such as capital, land, knowledge and technologies to overcome these challenges. For instance, women's access to technologies for collecting and storing water reduced the time spent by the family (often by women) collecting water. In addition, biodigesters and fuel-efficient stoves reduced GHG emissions and saved women time on domestic tasks. The time-saving technologies allowed women to invest time in project training, learning new skills and in taking part in rural organization management, as shown by the increased number of women assuming leadership positions in rural organizations supported by the project.[331]

Strengthening capacities of family farmers and small-scale producers in climate-resilient agricultural production is essential to promote the climate resilience of agrifood systems and, consequently, guarantee the availability of food, thus contributing to containing the risk of productive losses due to extreme climate events and to increasing profitability, while improving food security and nutrition and promoting rural development.

D. Diversification of the food supply of importing countries

Trade plays an important role in the resilience of agrifood systems as it allows countries to draw on international markets in situations of domestic supply shortages.[332] As climate variability and extremes become more frequent and intense, affecting different regions in varied ways (CHAPTER 5), they can disrupt the distribution and supply of food chains. Trade could play a crucial role in adaptation value chains efforts, contributing to food security of the affected communities and population.[333] In the short term, trade can be an important mechanism for addressing production deficits caused by extreme weather events, while in the long term it could help to efficiently adjust agricultural production across different countries. For countries facing water scarcity due to climate change, virtual water trade can play a crucial role. Virtual water is the volume of water required to produce a food product, which is thus virtually embedded in the product.[334] By enabling regions to import goods from areas with higher water productivity, it offers a potential solution to mitigate water scarcity and enhance water security.[335] The integration of global agricultural markets should strengthen the adaptive role of trade in terms of increasing the availability of and access to food (CHAPTER 6) in countries negatively affected by climate conditions.[336, 337]

The diversification of trading partners of countries that are net importers can help reduce dependence on a single country or region and ensure that countries have access to foods they need, even in times of crisis, such as those that may arise due to extreme climate events. Shocks to domestic food production such as those arising from extreme climate events, socioeconomic and geopolitical crises, and pandemics can be cushioned through trade, which can help smooth out fluctuations in the supply of nutritious foods and price volatility.[338]

The 2030 Agenda for Sustainable Development recognizes international trade as a driver of inclusive economic growth and poverty reduction, and as an important means to achieve the SDGs.[339] Moreover, international trade of agrifood contributes to food security and nutrition at a global scale.[340,341] The presence of open, predictable, transparent markets, governed by efficient regulations, and that do not harm small-scale producers, improves the efficiency of agriculture and provides consumers with a broader supply of nutritious foods at more affordable prices. In this regard, trade can play a key role in promoting healthy diets, helping countries meet their food needs in quantity, diversity and nutritional quality.[342]

In the region, the variety of foods produced within the countries are a unique opportunity for complementarity which reflects intraregional trade possibilities not yet exploited in a wide range of products such as corn, soybeans, wheat, poultry meat, soybean meal, milk, as well as fruits and vegetables. In order to take advantage of this opportunity, it is necessary to move forward towards a trade agenda and to eliminate existing obstacles to trade and to strengthen regional integration, to promote the stability of nutritious food supplies, especially between subregions, which is where there is a lower density of trade agreements.[343] In this regard the Caribbean countries are moving forward committing to reduce their large food import bill by 25 percent by 2025 (BOX 13).

Although there are now more countries connected to more trading partners, most of the value of traded goods still accrues to just a few countries, while only a few countries import a wide variety of food and agricultural products from many different trading partners. Relying on a few trading partners can lead to imbalances and vulnerability to shocks in both importing and exporting countries.[344]

BOX 13

THE CARIBBEAN COMMUNITY 25 BY 2025 INITIATIVE

Caribbean countries are net food importers, which increases their vulnerability to disruptions in value chains. They depend on imports of such essentials as wheat, diary and animal feeds. In 2022, CARICOM countries committed to reducing their large food import bill by 25 percent by 2025. The initiative involves a long term social and economic partnership between the CARICOM countries, private sector (CARICOM Private Sector Organization-CPSO), organizations, producer groups, development partners and civil society.

CARICOM 25 by 2025 includes actions and critical areas of intervention to tackle the subregion's food import bill and improve intraregional trade. Among the objectives are removing non-tariff barriers to trade, providing alternate financing and insurance for the sector, increasing the availability of transportation services for agrifood products, and creating greater cross border investment, human resource development and climate smart production mechanisms. Also, the initiative includes among the priority foods such nutritious food as poultry meat, corn, soya, rice, niche vegetables, coconuts, fruits and root crops.

Some of the relevant developments achieved to date are the approval of five game changing policy actions and strategies, including the CARICOM Trade Policy for Animals and Animal Products, the Regional Agricultural Heath and Food Safety Policy, the Alternate Sanitary and Phytosanitary Dispute Resolution Mechanism, 19 Special Guidelines for the Trade in Animal and Plant Commodities, and approval of the Regional Pesticide Draft Model Bill.

This initiative is tackling relevant issues related to trade in the Caribbean, addressing vulnerabilities and seeking to ensure food security and nutrition in their countries.

Source: CABA (Caribbean Agribusiness Association). n.b. CARICOM 25 by 25 Initiative. In: CABA. [Accessed August 10 2024]. https://agricarib.org/caricom-25-by-2025-initiative/

To ensure a diverse range of suppliers, regional trade agreements are necessary. The agreements have the potential to foster regional agricultural and food value chains, establishing additional rules for cooperation and harmonization of food standards and regulations.[345] In this regard, it is desirable to move towards the expansion of intraregional trade among countries in Latin America and the Caribbean. Today, intraregional trade does not reach 15 percent, but according to the study carried out by FAO and the Inter-American Development Bank (IDB),[346] the potential market (imports that currently do not originate in the region) is around USD 24.7 billion (equivalent to 8.5 percent of the region's agrifood exports, 21 percent of its agrifood imports and 57.2 percent of its intraregional trade).[347] The expansion of trade can be carried out based on existing agreements or through new mechanisms and agreements for greater integration of the agrifood sectors of the region.

It is necessary to move forward in overcoming tariff and non-tariff barriers that hinder the trade of agrifoods products and increase trade costs, seeking regulatory convergence and homogenization, particularly in relation to sanitary and phytosanitary measures, as well as the simplification of customs procedures.[348],[349] On average, a food product is subject to eight different rules and non-tariff measures, and complying with these significantly increases the cost of trade and, consequently, could impact the affordability and diversity of diets.[350]

While import tariffs protect producers' prices from international competition, they could penalize consumers who pay higher prices for tariff-protected foods and expose them to the risk of being unable to afford a healthy diet.[351] For example, in January 2023, given the smaller white corn harvest that occurred in 2022, as well as the increase in domestic prices, Mexico eliminated import tariffs on non-genetically modified white corn intended for human consumption. Import tariffs were already zero for countries with preferential trade agreements, but 20 percent otherwise.

Among the measures that have been implemented and that contribute to increasing the import of nutritious foods, the ePhyto solution developed by the International Plant Protection Convention (IPPC) stands out. The ePhyto is an electronic phytosanitary certificate, equivalent to a paper phytosanitary certificate, with benefits that include the potential reduction of fraud, improved efficiency, expedited release of merchandise, global standardization, elimination of the need for bilateral agreements, and the potential linkage with other electronic systems. In the region (and in the world), Argentina has played an important role, being one of the first countries to advance this type of solution, leading the implementation of ePhyto in Latin America and the Caribbean since 2012. In May 2020, during the COVID-19 pandemic, Argentina and Chile implemented electronic certification for all vegetable trade.[352]

In relation to the recognition of the sanitary and phytosanitary regulations of the countries, in 2020 the recognition of equivalence between sanitary systems was achieved for the authorization of import into Colombia of meat and edible meat products of the bovine and ovine species from Argentina.[353]

Also, some non-tariff measures, such as labelling and packaging requirements, which can be implemented in a transparent manner based on objective data, can increase consumer confidence and, consequently, promote the consumption of nutritious foods.[354]

In addition, with the aim of contributing to simplifying administrative procedures at the borders, the Members of the World Trade Organization (WTO) negotiated and approved the Trade Facilitation Agreement (TFA) at the 2013 Bali Ministerial Conference, which came into force in 2017. Almost all countries in Latin America and the Caribbean have ratified the TFA, and cooperation initiatives have been promoted in the region to promote the transit of agrifood products.[355]

Within the framework of the COVID-19 pandemic, Chile implemented foreign trade facilitation measures, such as allowing the electronic submission of forms and applications that must be filled out at all sea, air and land ports.[356]

The diversification of trading partners in the agrifood sector plays a key role in mitigating risks and ensuring both availability of and access to foods, especially in times of crisis. It is important to understand and balance trade, as well as supporting local production. Sustainable trade promotes climate-friendly agricultural practices, fosters dietary diversity and supports small-scale farmers. Ultimately, well-regulated and sustainable agrifood trade can be a powerful tool for ensuring food security in a world increasingly affected by the frequency and intensity of extreme climate events. Further research is needed on the effectiveness of trade diversification in mitigating the impacts of climate variability and extremes on local economies, as well as how increased trade affects sustainability practices within trading partners.

As aforementioned and illustrated in FIGURE 46, the recurrent combination of climate variability and extremes with the underlying factors, calls for additional measures to address compounded challenges in food security and nutrition. Building climate resilience for food security and nutrition requires not only tackling climate risks but also implementing policies that promote healthier consumer behaviour through enhancing access to and affordability and consumption of healthy diets, creating healthier food environments as well as building resilience capacities among populations in vulnerable conditions. The following sections present these complementary measures in greater detail.

7.2 INTERVENTIONS TO PROMOTE HEALTHIER CONSUMER BEHAVIOUR BY ENHANCING ACCESS TO AND AFFORDABILITY OF HEALTHY DIETS

Transforming food environments to enable access to healthy diets involves providing physical access to healthy diets that reduce the risk of all forms of malnutrition, including undernutrition, overweight and obesity, and reduce the risk of diet-related non-communicable diseases.[357]

Increased access to and affordability and consumption of healthy diets is associated with improved food security and nutrition. Achieving SDG 2 requires that all people must have access to a healthy diet, as this guarantees the satisfaction of energy needs, macronutrients (proteins, fats and carbohydrates with dietary fibre) and essential micronutrients (vitamins, minerals and trace elements).[358]

In Latin America and the Caribbean, policies that promote access, affordability and consumption of healthy diets are essential. However, these policies must be complemented by interventions aimed at shifting actual consumption patterns towards healthy diets supported by sustainable agrifood systems.[359] Many factors and elements within the food environment determine dietary patterns.[360, 361]

Policies and interventions aimed at improving access to and affordability of nutritious foods and at promoting the consumption of healthy diets, such as school feeding programmes, are needed to improve food security and nutrition, and to prevent setbacks in the progress made to date.

The implementation of these policies, along with other consumer-oriented measures (see BOX 14) plays a critical role in promoting the resilience of agrifood systems in the face of climate-related challenges and mitigating the impact of rising food prices – further exacerbating the difficulty of affording and consuming healthy diets – due to drivers such as climate variability and extremes, which affect food security and nutrition. These policies promote climate resilience in agrifood systems, for instance, by encouraging sustainable practices among both consumers and producers, as well as supporting local economies. Even a small group of consumers adopting a marked change in behaviours can lead to significant changes in agrifood systems, thereby reducing environmental and social hidden costs as well.[362]

A. School feeding programmes for promoting access to and affordability of healthy diets

School feeding programmes are one of the social public policies with the greatest coverage and budget allocation in the countries of Latin America and the Caribbean, due to their importance in providing students with regular meals in schools and serving as an important social safety net for vulnerable populations. In 2022, approximately 80.3 million children at the preschool, primary and secondary levels in public educational institutions benefited from these programmes in 31 countries in Latin America and the Caribbean, making it the region in the world with the second-highest student coverage, with a regional investment estimated at USD 7.6 billion.[363]

Despite the mixed evidence, school feeding programmes have been associated with broader benefits across multiple intersectoral objectives such as health, nutrition, education, human capital and local agriculture,[364,365,366,367,368] depending on the modality of food provided and the integration with complementary interventions.

Given the greater frequency and intensity of climate variability and extremes, school feeding programmes can play a key role in strengthening the resilience of agrifood systems. These programmes help mitigate the immediate impacts of food insecurity on the targeted student population and other populations and communities that may not participate in these programmes but are still negatively affected by climate shocks. By providing a regular source of nutritious food, they contribute to enhancing the capacities of children, and their families, enabling them to better prepare for and respond to climate-related shocks.

In addition, school feeding programmes constitute an intervention that facilitates the adaptation and response of agrifood systems to climate events or health emergencies that affect food supply chains, food environments, and food access and consumption. If these programmes are continued during crises, or even escalated, they can become a powerful mechanism of shock-responsive social protection and a means to guarantee the Right to Adequate Food of the population that is most affected by these events or emergencies.

Despite the challenge of guaranteeing the operation of school feeding programmes in emergency contexts, their capacity, flexibility and adaptability to support people affected by crises has been demonstrated on various occasions, such as during the COVID-19 pandemic and in response to the different natural threats that have affected the region. In times of crisis, in addition to providing food directly to students and their families (if they include a take-home ration), these programmes can also discourage negative coping strategies and encourage families to keep children in school.[369]

In general, the response of the school feeding programmes in the region during the pandemic was to temporarily replace school feeding with take-home food baskets, monetary transfers, or a combination of strategies. Additionally, through some programmes, supplementary rations were extended to the non-student population in vulnerable situations.[370]

The take-home food baskets that were distributed varied between countries. For example, Argentina, Chile, Mexico and Uruguay included fruits and vegetables in their food baskets. It is notable that even in the midst of a crisis, the quality and variety of school feeding has been a priority. The baskets provided enough food to last from a range of 15 days (Argentina and Chile) to 50 days (Guatemala),[371] so the delivery frequency also differed among countries.

Regarding assistance in the form of monetary transfers, the Trinidad and Tobago school feeding programme replaced school meals with prepaid food vouchers worth approximately USD 76 per month.[372] Within the group of countries that opted for a combination of strategies, which are generally mutually exclusive, are Brazil and the Bolivarian Republic of Venezuela, where the delivery of food baskets and ready-to-eat/commercially-prepared ration[373] were used. Colombia established three temporary modalities of feeding, which continued even during school holidays: take-home food baskets, ready-to-eat/commercially-prepared rations and monetary transfers through a food voucher, equivalent to USD 13 per month, to be redeemed at authorized points.[az, 374] In the Plurinational State of Bolivia, in addition to take-home food baskets, the delivery of the Jacinto Pinto Bonus was brought forward, which is awarded at the end of the year to primary and secondary school students, in order to compensate for the lack of school feeding.[375]

In Peru, in addition to providing food services to students of public educational institutions, the school feeding programme provided food to people in vulnerable conditions (people in poverty, pregnant women, the elderly, people with disabilities, Indigenous Peoples, and people in correctional facilities and youth centres).[376]

The experience in the region indicates that school feeding programmes have provided additional assistance to the student population during climate crisis and emergencies, mainly due to the broad coverage and integrated delivery systems.

Between 2014 and 2016, through its school feeding programme, Nicaragua responded to the prolonged drought by providing one additional meal per day to school children in 51 municipalities of the Dry Corridor. Similarly, in response to the 2015 drought, Honduras expanded its programme during the holiday season by providing food to 1 799 students for 35 days in the municipalities of Alianza, Aramecina, Goascorán, Langue, San Francisco de Coray and Nacaome.[377]

In Nicaragua towards the end of 2020, hurricanes Eta and Iota affected 56 of the country's 153 municipalities. The school feeding programme offered assistance to students by providing an additional snack, and also distributed take-home rations

[az] It should be noted that the voucher could only be used for a list of specific products, usually similar to those in the food basket. Thus, in several cases the purchase of highly processed or sugary foods that are not part of the school feeding programmes was not permitted.

for both the students and between three and five of the students' family members.[378] In 2021, in Saint Vincent and the Grenadines, in response to the emergency caused by the eruption of the Sufrière volcano, the Ministry of Education established 55 temporary learning centres to reintegrate affected students into the education system and guaranteed the provision of school meals in these centres.[379]

School feeding programmes can also contribute to the resilience of agrifood systems as a preventative and long-term measure by incorporating public purchases from family farming,[380] as well as including more local and seasonal fruits and vegetables in school menus. In the region, at least 15 countries purchase local food or a portion thereof.[381] For instance, in Brazil, the national school feeding programme has been operational since 2009 and has helped support around 450 000 family farmers each year. This initiative, along with the food purchase programme, has facilitated significant economic benefits within the sector.[382] Incorporating local procurement from family farming into school menus can positively impact sustainable and resilient production, enhance the income and livelihoods of communities, and promote greater access and consumption of healthy diets.[383]

Through public purchases, a structured and predictable demand is generated for producers. School feeding programmes offer several potential benefits by supporting food production and promoting sustainable local markets for diverse and nutritious foods, thereby contributing to the economic and social insertion of farmers in their communities, which boosts local economic development.[384, 385] When school feeding programmes are connected to local family farmers and small-scale producers, they can also provide an opportunity to promote local economic recovery after a crisis.[386] Additionally, local public purchases in school feeding programmes result in a lower environmental impact, since geographical proximity reduces transportation distances and storage times, which in turn contributes to reducing the deterioration of perishable products.[387]

Therefore, school feeding programmes have the possibility of generating a stable market and a regular and reliable source of income for family farmers, who are highly vulnerable to the impacts of extreme weather events and climate variability, as providers of nutritious, varied and locally grown foods. It is worth highlighting the Sustainable Schools Methodology, created in 2011 within the framework of the Brazil–FAO International Cooperation Programme, which aims to make school feeding more efficient, effective and sustainable. The methodology is based on the foundation that healthy eating habits and good nutrition in childhood promote adequate growth and development, learning, health and the reduction of risks of chronic diseases throughout life.[388] The methodology is organized based on six components,[ba] including public purchases from family farmers and small-scale producers for school feeding programmes, which are complementary and allow this action to be expanded to the national level as a state policy.[389] One of the objectives of the methodology is related to the increase in consumption of fruits and vegetables, which is why it prioritizes family farming as the main provider of local, fresh and nutritious foods and includes nutrition education to shape children's attitudes and outlooks about food and further promotes resiliency.

[ba] The methodology consists of six components: inter-institutional and intersectoral coordination; social participation; adequate infrastructure; food and nutrition education with educational school gardens; healthy, tasty and appropriate menus; and public procurement of food from family farms.

School feeding programmes are one of the main platforms with a broad capacity to support vulnerable populations in the region. It is crucial that school feeding programmes invest in their capacity to prepare for and respond to various crises, including climate events. In addition, it is necessary to continue promoting the increased consumption of healthy foods, such as of fruits and vegetables, and healthy diets in general through these programmes, given that investing in this life stage of the population is key. Thanks to their structure, these programmes can offer established logistics and delivery networks, making them an ideal platform to temporarily reach the entire household or vulnerable populations negatively affected by climate impacts. This can be achieved by temporarily channelling additional resources as a recovery measure, by increasing the amount of food or providing monetary transfers to satisfy the needs of the affected population, and not exclusively of the students who are part of the programme.[390] It is important to prevent a burden of responsibility that is out of the scope of the programme. Even though it may be a temporarily measure, the programme should be strengthened and provided with the necessary resources (financial, human, etc).

BOX 14
TAXATION AND SUBSIDIES

There are interventions linking fiscal policies with food security and nutrition outcomes to help promote the consumption of healthy diets. Charging taxes on products of high energy density and minimal nutritional value, and offering subsidies to promote healthy diets, could provide consumers with an economic and rational decision making justification for a sustainable change.[391] Taxes and subsidies affect the pricing of various goods, thereby influencing consumer choices.

Taxes levied on products of high energy density and minimal nutritional value, such as sugary-sweetened beverages and highly processed foods, have the potential for a triple win: improving health, mobilizing government revenue and enhancing equity.[392,393]

By decreasing the consumption of high-energy products with low nutritional value and creating incentives to replace them with healthier options, health taxes can contribute to reducing overweight and obesity, ultimately lowering healthcare system costs. By generating additional resources for spending on food or improving food environments, such taxes can indirectly help reduce undernourishment and food insecurity.[394]

In Latin America and the Caribbean, 24 out of the 33 countries apply taxes on sugar-sweetened beverages and three countries (Colombia, Dominica and Mexico) apply taxes on highly processed foods.[395,396,397] For a more significant impact, taxation on products of high energy density and minimal nutritional value must be accompanied by measures that ensure access to healthy alternatives, such as subsidies, which can increase the availability of healthy food and reduce its price, thereby encouraging its consumption. Food subsidies to promote healthy diets targeting low-income households are beneficial for increasing the affordability of healthy diets. For example, in 2019, Costa Rica enacted Decree No. 41615-MEIC-H, a regulation that approved the basic tax basket. This basket establishes a reduced value-added tax (VAT) rate of 1 percent for goods listed in this basket, as opposed to the 13 percent VAT applied to other goods and services not listed. This measure could reduce the gap between the prices of foods of high energy density and minimal nutritional value and nutritious foods that contribute to healthy diets.

Fiscal policies, such as taxes on highly processed food and subsidies for fruits and vegetables are pivotal interventions that can effectively promote the consumption of healthy diets. Despite the challenges associated with the implementation of these polices, experiences from countries in the region demonstrate promising outcomes in reducing the consumption of sugary drinks and redirecting tax revenues towards health programmes. To maximize effectiveness, these fiscal measures should be accompanied by supportive policies that improve food environments and enhance food security and nutrition, such as front-of-pack nutrition labelling and food and nutrition education that can discourage the consumption of foods with high energy density and minimal nutritional value.[398]

7.3 INTERVENTIONS TO CREATE HEALTHIER FOOD ENVIRONMENTS TO ENSURE FOOD SECURITY AND NUTRITION

Food environments encompass physical, economic, sociocultural and policy conditions that influence access, affordability, safety and preferences related to food.[399] Healthy food environments are safe and supportive food environments that provide physical access to nutritious foods for healthy diets that reduce the risk of all forms of malnutrition, including undernutrition, overweight, obesity and diet-related non-communicable diseases.[400,401] Implementing policies that strengthen healthy food environments is essential for enabling and motivating consumers to make dietary changes aligned with healthy diets, and encouraging producers and manufacturers to shift towards more sustainable production practices, including environmental aspects.

As previously mentioned, climate variability and extremes are among the major drivers while unhealthy food environments are one of the underlying factors that contribute negatively to food security and nutrition. These drivers impact agrifood systems, affecting elements of the food environment that determine dietary patters, particularly how food is sourced, generated, produced and consumed. For example, prices of nutritious foods that are part of healthy diets can increase due to the impacts of climate variability and extremes on local food production, leading to a trend or likelihood of changes in dietary patterns and a shift from more nutritious foods to highly processed ones. Implementing interventions that promote healthier food environments, combined with policies that prevent price fluctuations, can help drive adjustments towards the consumption and production of healthier and more sustainable foods in the long term, even when facing impacts of climate variability and extremes. It is suggested that further evidence be gathered on the link between food environment interventions, climate and nutrition.

Promoting healthy food environments improves access to and affordability and consumption of healthy diets, which is fundamental for achieving food security, improving nutrition outcomes and preventing the effects of the drivers of food insecurity and malnutrition, including climate trends. For example, the PRO-Resilience Programme (2020–2025) in Guatemala aims to improve the living conditions and nutritional well-being of 6 000 households in the country's Dry Corridor. As part of this effort, the programme has worked on nutrition education by training community leaders on malnutrition prevention and the promotion of healthy diets. Networks of community health counsellors have been established to facilitate access to nutrition and health information in more than 60 communities. In addition, in collaboration with the government, nutrition brigades have been created that have identified and assisted more than 8 300 people at risk of malnutrition. This strategy underscores the importance of a multi-sectoral approach in behaviour change campaigns, which encourage healthy eating practices, and the consumption of local produce to increase the nutritional self-sufficiency of communities.

Evidence increasingly shows that global agrifood systems and their resulting diets play important roles in mitigating climate impacts. To stay within planetary boundaries, adopting healthy and sustainable dietary recommendations would substantially reduce the environmental impact of diets.[402] Transitioning to more sustainable agrifood systems that support healthy diets is also a pathway to adaptation and, consequently, resilience.

A. Food systems-based dietary guidelines

Food-based dietary guidelines (FBDGs) are context-specific advice and principles of healthy diets that are rooted in sound evidence. They respond to a country's health and nutrition priorities, food production and consumption patterns, and sociocultural influences, among other factors.

There is a need to accelerate the transformation of agrifood systems to strengthen their resilience to the major drivers of food insecurity, including climate variability and extremes, and to strengthen the underlying structural factors to ensure that healthy diets are affordable for and available to all. FBDGs are a policy tool to promote healthy diets at the country level and make policy decisions to address these drivers and factors. More evidence will be necessary in the future regarding the association between climate variability and extremes and access to and affordability of healthy diets. They are meant to define and measure healthy diets at the national level (BOX 15), as well as to inform policies to ensure healthy diets.

BOX 15

MONITORING THE COST AND AFFORDABILITY OF HEALTHY DIETS AT THE NATIONAL AND SUBNATIONAL LEVEL IN THE CARIBBEAN

The cost and affordability of a healthy diet (CoAHD) has been tracked globally since 2020 in the State of Food Security and Nutrition in the World reports. It is an indicator of the cost of purchasing the least expensive locally available foods that could make up a diet that meets the requirements for energy and the food-based dietary guidelines (FBDGs) for a representative person (cost of a healthy diet). It is also an indicator of the inability of a household or an individual to afford the least-cost combination of foods that meet the requirements for a healthy diet. The Caribbean subregion in particular faces some of the highest costs of a healthy diet in the world, with 1.20 PPP dollars above the world average.

The costs of a healthy diet reported by FAO are sourced from a single unique price dataset, curated by the International Comparison Program (ICP) at the World Bank. The ICP assembles and publishes price data every few years, most recently in 2011, 2017 and 2021.[403] In each country, item prices consist of a single national annual average price. This data is useful for international comparisons and global monitoring, and for comparisons between regions. However, for monitoring within countries at the subnational level it is necessary to have data that is current, updated more frequently, and that is representative of states or parishes to show subnational differences.

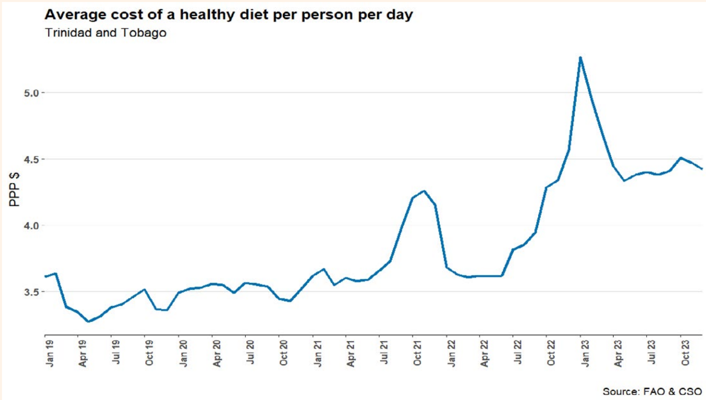
The subregional office of FAO for the Caribbean is supporting the calculation of CoAHD at the national and subnational level within countries in the Caribbean. The calculation requires food price data for a diversity of food items across all food groups derived from selected FBDGs. The food groups used in national FBDGs of the English-speaking Caribbean countries are starchy staples, vegetables, fruits, animal-source foods, legumes, nuts and seeds, and oils and fats. These are similar to those in the healthy diet basket (HDB) used for global monitoring.

The Caribbean subregion has a history of tracking a similar indicator. In the early 2000s, the Caribbean Food and Nutrition Institute (CFNI) supported countries to collect food price data and compute the cost of a balanced diet.[404] This data were tracked in 11 countries and used for policy applications such as influencing the minimum wage and, in some countries, for calculating the poverty line. The CoAHD adopts this tradition, updating the method to increase the feasibility for countries to integrate it into their existing systems and to use the results. Prices for a large array of food items are routinely monitored by the national statistical offices of each country. These can readily be used to calculate the cost of a healthy diet on a monthly basis at the subnational level.

Using computational tools developed by the Food Prices for Nutrition project at Tufts University,[405] prices from the Trinidad and Tobago Central Statistical Office (CSO) were used to calculate the CoHD from January 2019 to December 2023.[*] The results show that the average cost of a healthy diet for Trinidad and Tobago in 2023 was 4.55 PPP dollars, slightly lower than the 2022 cost of a healthy diet reported by FAO of 5.08 PPP dollars, using the ICP dataset.

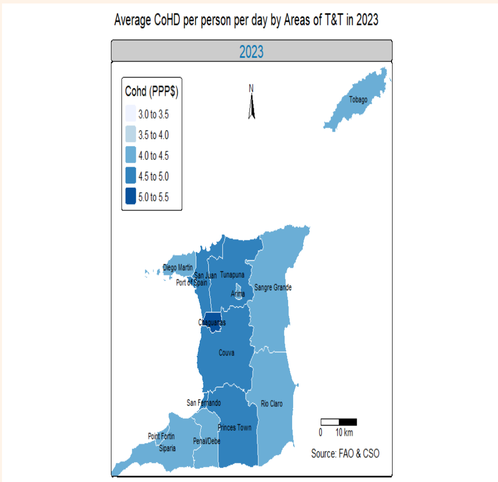
The cost has risen since 2021 (Figure A). After a spike in late 2022, the price declined and stabilized from April to December 2023. The highest cost food group was usually vegetables, at almost a quarter (24 percent) of the cost. Subnationally, the highest costs were recorded in Chaguanas. Using the CSO data adds value beyond the global dataset in terms of data that is frequently updated (Figure A) and disaggregated by area (Figure B).

Figure A.
Average cost of a healthy diet per person per day in Trinidad and Tobago, from national monitoring



Source: 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.

Figure B.
Average cost of a healthy diet per person per day from national monitoring by areas of Trinidad and Tobago in 2023



Note: Refer to the disclaimer page for the names and boundaries used in this map.
Source: FAO & CSO based on price data from Trinidad and Tobago Central Statistical Office (CSO)

Initial results in Trinidad and Tobago show the potential for governments to monitor the CoAHD routinely, and to integrate it into existing price data collection and reporting systems. CoAHD has been monitored by national governments in several other countries.[406] The information has been used to address the high cost of food, poverty and social protection, notably in Nigeria where it was used in negotiations to influence an increase in the minimum wage in July 2024. The CoAHD indicator identifies which food groups are too expensive for many to afford, with implications for trade policy, diversion of foods to the tourist market and agricultural policy. The indicator intersects with other policy aims, including 25 x 2025, which seeks to reduce food imports by 25 percent by 2025. The next steps would be toward a coordinated monitoring across the Caribbean in partnership with CARICOM.

* The dataset included 100 unique items; several relevant items were excluded due to missing unit data; their exclusion may cause an upward bias in the result.

FBDGs also consider local food availability (such as seasonality of food production) and access, while mainstreaming gender and life cycle approaches. These guidelines can be developed or updated considering environmental aspects (for example, GHG impacts) of food production and processing. This comprehensive approach enables FBDGs to support actions that proactively identify and balance trade-offs in promoting sustainable agrifood systems and healthy diets.[407]

Currently, 28 out of the 33 countries in Latin America and the Caribbean have developed FBDGs consistent with their respective dietary situations, food availability, culinary cultures and eating habits.[bb] This demonstrates a regional commitment to enhancing the dietary patterns and health of the population. However, these guidelines have not yet considered other country commitments such as the Paris Agreement[bc] and other environmental targets associated with the climate resilience of agrifood systems.

While FBDGs are not specifically designed to address the impacts of climate variability and extremes on food security and nutrition, integrating them with the sustainable agrifood systems approach can lead to more holistic food and nutrition policies that recognize and address the challenges posed by this major driver.

To cover the gap in guidance and tools, and advance the transformation of agrifood systems towards healthy diets and sustainability and generate public policies that go beyond the consumer, FAO developed the FSBDG methodology. This methodology aims to support countries to develop and implement context-specific, multi-level recommendations that outline what constitutes a healthy diet based on sustainable agrifood systems, and to support people to adopt dietary patterns that promote health and, among other outcomes, environmental sustainability and socioeconomic equality.[408]

Healthy and sustainable dietary patterns (including flexitarian, pescatarian, vegetarian and vegan diets) could lead to a reduction of between 92 and 97 percent in direct and indirect healthcare-related costs and between 40 and 76 percent in climate-related costs by 2030. The greatest reductions are projected for those diets that include the most plants.[409] Additionally, a report by the EAT-Lancet Commission on Healthy Diets from Sustainable Food Systems proposes a global dietary pattern made of a wide ranges of intakes for food groups to accommodate varying regional and cultural preferences and environmental goals. This framework includes more than doubling the consumption of nutritious foods, such as fruits, vegetables, legumes and nuts, and reducing the consumption of less nutritious foods, such as added sugars and red meat, by over 50 percent. However, the role of animal source foods in people's diets must be carefully considered in each context and within local and regional realities.[410]

Some countries in the region have incorporated sustainability components into their dietary guidelines, such as Brazil, Chile, Ecuador and Mexico. This represents an advance on traditional guidelines. For instance, in Brazil, the FBDGs primarily

[bb] See FAO. n.d. Dietary guidelines. In: FAO. [Accessed August 10 2024]. https://www.fao.org/nutrition/education/food-dietary-guidelines/home/en/

[bc] The Paris Agreement is a landmark international treaty on climate change adopted by 196 countries at the United Nations Climate Change Conference (COP 21) in Paris, France, on 12 December 2015. The agreement entered into force on 4 November 2016, and its central aim is to limit global warming to well below 2 °C, preferably to 1.5 °C above pre-industrial levels, to reduce the risks and impacts of climate change.

emphasize that healthy diets derive from socially and environmentally sustainable food systems and that dietary recommendations should take into account the impact of food production and distribution methods on social justice and environmental integrity.[411,412]

Other countries such as Costa Rica and the Dominican Republic have mobilized a wide variety of actors and established concrete goals for the implementation of dietary guidelines, and their good practices are encouraging for the rest of the continent. Costa Rica has developed a series of dietary guidelines tools for the adolescent and adult population, including multilevel technical recommendations considering the agrifood system. For example, it has considers the food supply chain, food environment, and consumers behaviour and diets.[bd] In the Dominican Republic, the dietary guidelines aim to encourage inhabitants of the country to adopt healthier diets that prevent diseases related to food deficits or surpluses, and promote a balanced, quality diet that provides the necessary nutrients.

Dietary shifts play a crucial role in reducing the environmental impacts of food consumption. Given this context, it is recommended that the FBDGs be updated to consider environmental targets and to take a food-systems approach. This approach aims to promote healthy diets and sustainability that align with and respond effectively to emerging challenges, thereby contributing to a transition towards sustainable and resilient agrifood systems.[413]

Developing FSBDGs is a vital step in encouraging the adoption of such diets at the population level. To maximize the impact of these guidelines on dietary patterns, clear and consistent policy support is essential.[414] Both policymakers and consumers can benefit from FSBDGs that are based on local diets and involve the productive and environmental sectors, as well as social actors, in their development and implementation processes.[415] However, given that this is a new approach, there is a gap of evidence regarding the implementation of FSBDGs; therefore, more knowledge in relation to the impact on food security and nutrition in the context of climate variability and extremes will be needed.

The benefits of adopting environmentally sustainable and healthy diets will vary by country, along with the methods needed to realize these benefits. However, the advantages of basing dietary guidelines on food systems are multisectoral and multidisciplinary. FSBDGs that include sustainability considerations can not only be used for consumer education but can also help inform policies, programmes and investments all along food systems. By adopting this comprehensive approach, it is possible to integrate a greater number of actors in the fight against all forms of malnutrition and address the problems from a broader perspective, including climate impacts.

FSBDGs should support other complementary policies, such as front-of-package nutrition labelling (BOX 16) and school meals guidelines and standards. While these policies may not directly impact food access and consumption in the context of climate variability and extremes, they serve as part of a government-led effort to build

[bd] See Ministry of Health, Comisión Intersectorial de Guías Alimentarias. [Intersectoral Commission on Food Guidelines]. In: Ministry of Health. [Accessed August 10 2024].
https://www.ministeriodesalud.go.cr/guiasalimentarias/gabsa/index.html#teenBlock

a path towards resilient agrifood systems. By creating a healthy food environment and shifting consumption and production patterns towards healthier and more sustainable practices, these measures can contribute to the sustainability of agrifood systems.

BOX 16

FRONT-OF-PACKAGE NUTRITION LABELLING FOR INFORMING HEALTHIER CHOICES

There is evidence regarding how front-of-package nutrition labelling systems in Latin America and the Caribbean reduce the consumption of highly processed foods high in calories and with excessive quantities of one or more critical nutrients, such as sugar, sodium, fats, saturated fats, industrial trans-fatty acids and non-sugar sweeteners.[416,417] They also play a key role in encouraging the reformulation of food products.[418, 419, 420, 421]

These labels can be powerful tools in guiding consumers towards healthier food choices[422] as food packaging serves as a crucial instrument for informing consumers about potential food safety risks.[423] Through nutrition labelling measures, consumers can change their dietary patterns, food preferences, beliefs and values all related to the way food is sourced, generated, produced and consumed. Consumers' perspectives can influence product reformulation by guiding the market supply through their choices and preferences.[424] A range of labels exist in the market, addressing either individual factors like carbon footprint, nutrient content and working conditions, or encompassing multiple aspects, such as animal welfare and local production.[425]

Given the complexity of shifting dietary patterns and food preferences, for maximum effectiveness nutritional warning labels should be accompanied by policies and measures that develop and strengthen healthy food environments, as well as facilitating the modification of purchase intention in favour of healthier food choices, such as regulating marketing including advertisements (Argentina, the Plurinational State of Bolivia, Chile, Colombia and Peru), the extension of law enforcement in schools (Argentina, Chile and Peru) and food vending establishments (the Plurinational State of Bolivia and the Bolivarian Republic of Venezuela), the promotion of healthy diets (the Plurinational State of Bolivia, Colombia and Mexico), and initiatives to encourage physical activity (the Plurinational State of Bolivia, Mexico and Peru).[426,427]

There is a need to address the information gap regarding the climate outcomes that can arise from food policies such as front-of-package nutrition labelling interventions. There is growing evidence that the environmental impact of food products is not always aligned with their nutritional profile, meaning that a product that is considered healthy might have a significant ecological footprint. In the context of climate variability and extremes, front-of-package nutrition labelling and nutrient profiling could now incorporate their ecological footprint, such as GHG emissions, fire usage, water consumption and land degradation associated with their production.[428] This dual approach would align agrifood systems with efforts to achieve food security, nutrition and environmental goals, and ensure that both consumers and producers are more aware of the broader impact of their choices.

7.4 OTHER SYSTEMS THAT SUPPORT CLIMATE RESILIENCE OF AGRIFOOD SYSTEMS TO REDUCE INEQUALITY

While different systems such as water and health are essential for food security and nutrition in the context of climate variability and extremes,[429] this report focuses on social protection and agricultural insurance systems. This is due to the urgent need to strengthen the resilience and adaptative capacities of populations in vulnerable conditions who are more exposed to adverse climate impacts and inequality.

Social protection systems contribute to reducing vulnerability and strengthening livelihoods and food security, while mitigating the impacts of climate variability and extremes and enhancing adaptive capacities. Access to social protection contributes to anticipating and absorbing the impact of disasters[430] while reducing poverty, promoting sustainable livelihoods and protecting ecosystem services, and addressing the negative impacts of mitigation measures.[431,432] In this sense, social protection systems are a key policy to strengthen the social, economic and environmental resilience of populations, notably those living in vulnerable conditions.[433] On the other hand, risk transfer through agricultural insurance can significantly reduce (though not fully eliminate) the negative impacts of climate variability and extremes on agricultural livelihoods.[434] However, to protect livelihoods and food security against climate-related shocks and promote climate resilience in the mid and long term, it is key that social protection and agricultural insurance systems are connected to early warning and anticipatory action (BOX 17)[435] and to sectoral policies in agriculture, environment and labour.

BOX 17
CUBA'S INTEGRATED APPROACH TO DISASTER RISK AND FOOD SECURITY

Cuba is focusing on national food production to meet the recommended nutrition requirements of the Cuban population. Cuba, in collaboration with partners, promotes inclusive risk financing solutions to reduce farmers' vulnerability to drought and climate-related risks, including preventive insurance, disaster risk reduction measures, crop monitoring, and early-warning systems. This integrated approach aims to reduce farmers' vulnerability to these risks.

There have been efforts in enhancing farmer resilience through preventive insurance, which encourages participation in disaster risk reduction activities with premiums adjusted based on a vulnerability index. Using this approach, the local insurer, Empresa de Seguro Nacional, offers customized premiums in pilot areas to ensure food access and economic security for local farmers.

The Gibara Verde x Ciento project in Gibara, Holguín, launched in 2022, aims to improve agrifood system efficiency, resilience and sustainability amid climatic and economic challenges. The project provides inputs, technical training and promotes drought-resistant crops. It involves four cooperatives, distributing more than 47 tonnes of food weekly to support 930 children and 280 adults, fostering a connection between local agriculture and social protection systems, benefiting both food access and farmer livelihoods.

In 2023, through the initiative +Resiliente, 688 households benefited, with 251 receiving insurance payouts totalling USD 4 667. By 2025, the programme is expected to expand and to introduce parametric insurance to more Cuban farmers – a first in the country.

Cuba's experience emphasizes the significance of linking farmers to social protection systems and the role of agricultural insurance in ensuring food access and economic security. The Integrated Disaster Risk Management approach can significantly enhance women's economic empowerment and support households by incorporating insurance into a comprehensive food security strategy, benefiting livelihoods and resilience.

Sources: WFP. 2021. Innovating to achieve inclusive risk financing in Cuba: WFP's integrated approach to supporting vulnerable people. Rome. https://docs.wfp.org/api/documents/WFP-0000132784/download/?_ga=2.257840971.1176441517.1736193820-1385714825.1735939297; WFP. 2022. Gender & risk finance - Bridging gaps, building futures: gendered pathways in disaster risk financing for sustainable food systems. Rome. https://docs.wfp.org/api/documents/WFP-0000157156/download/?_ga=2.150284598.1624998139.1727710817-1911355187.1722887942; and WFP. 2023. Gender & Risk Finance - From Micro to Macro: Examples of Inclusive Disaster Risk Financing in LAC and West Africa. Rome. https://docs.wfp.org/api/documents/WFP-0000147307/download/?_ga=2.212795668.1624998139.1727710817-1911355187.1722887942

A. Social protection systems

Social protection plays a fundamental role in eradicating poverty and reducing inequalities, promoting inclusive rural development and transformation, guaranteeing the right to food, as well as making livelihoods more resilient to shocks and climate change. Through its functions of protection, prevention, promotion and transformation, social protection contributes significantly to these goals. Social protection measures, including cash and in-kind transfers, contribute directly or indirectly to meeting the four dimensions of food security and nutrition.[436, 437]

However, the region still faces challenges in expanding the coverage and response capacity of social protection systems to guarantee and ensure access for all people, including those living in vulnerable situations or poverty, such as informal workers, migrants and refugees, Indigenous Peoples, Afro-Descendent peoples, particularly during crisis and emergencies. As of 2023, in Latin America and the Caribbean, approximately 40 percent of the population and 60 percent of the population in vulnerability were not covered by social protection.[438] Since the cost of healthy diets in the region is the highest in the world (CHAPTER 4), both the unequal access to social protection and the limited value of the transfers with regard to minimum expenditure baskets undermine food security and nutrition.[439] It is essential to increase the value of transfers to ensure their sufficiency and adequacy.[440] In addition, since poverty and climate vulnerability in the region often overlap,[441] the interaction between these vulnerabilities further undermines food security and nutrition and access to other basic needs and services, with even more severe impacts on children.[be, 442]

[be] Social protection is also crucial in addressing the pervasive issues of child poverty and food insecurity. In this region, children are disproportionately affected by poverty, with 46.1 percent living in impoverished conditions, a rate 1.4 times higher than that of the general population. (See ECLAC. 2022. Panorama Social de América Latina y el Caribe, 2022 (LC/PUB.2022/15-P). [Social Panorama of Latin America and the Caribbean, 2022]. Santiago. https://hdl.handle.net/11362/48518) This overrepresentation places children at a heightened risk of food insecurity and inadequate nutrition. Chronic malnutrition affects 5.7 million children in Latin America and the Caribbean, a prevalence of 11.5 percent. (See UNICEF, WHO & World Bank Group. 2023. Levels and trends in child malnutrition. Joint Child Malnutrition Estimates. Key findings of the 2023 edition. https://iris.who.int/handle/10665/368038). Implementing robust social protection measures can help mitigate these challenges by providing a stable source of income and support to vulnerable families to cover their basic needs, ensuring that children have access to adequate nutrition, healthcare and education. This not only improves their immediate well-being but also fosters long-term development and breaks the cycle of poverty.

Social protection is central to achieving inclusive and climate resilient development.[443] It strengthens climate adaptation by increasing absorptive, anticipatory and adaptive capacities. In addition, social protection plays a pivotal role in all dimensions of climate action in rural settings by advancing inclusive and resilient climate adaptation and mitigation, while also addressing loss and damage through its focus on the population living in poverty who are the most vulnerable to climate risks.[444]

Social protection policies and programmes foster both adaptation and mitigation in a context of climate variability and extremes by addressing the root causes of vulnerability, such as poverty, inequality and social exclusion. Social protection enhances peoples' abilities to manage climate-related shocks by ensuring income stability, education and healthcare access, while building long-term adaptive capacities through investments in human development and livelihood diversification, thereby avoiding the use of negative coping strategies. Social protection can also contribute to climate action by conserving and restoring ecosystems and offering income support to address the socioeconomic effects of mitigation measures.[445,446]

Moreover, shock-responsive social protection systems are designed to protect individuals from the impacts of covariate shocks by ensuring that social protection policies and programmes can both continue routine support and expand or adapt to address emerging needs. These systems are increasingly important as shocks, such as those related to climate, become more frequent and predictable. Shock-responsive social protection includes both ex ante and ex post interventions. It can offer support through mechanisms like vertical expansion (increasing benefits for existing recipients) or horizontal expansion (extending benefits to new individuals in need), as well as through adjustments to programmes (by suspending conditionalities or changing the payment method and frequency).[447,448]

Against this background, there are a number of actions that can be implemented so that social protection interventions have the greatest possible impact on food security and nutrition:[449] i) increasing income/consumption; ii) supporting care, food and health practices and/or adoption of services; iii) strengthening links with health and sanitation services; iv) targeting populations in vulnerable situations from a nutrition perspective; v) addressing the needs of women and children; vi) including nutrition indicators in the programme monitoring and evaluation mechanism; vii) increasing the scale of social protection in times of crisis; viii) improving agricultural production and productivity; ix) incorporating a "do no harm" policy regarding nutrition outcomes; and x) incorporating nutritional education in social protection interventions.[450]

The COVID-19 pandemic highlighted the potential of social protection to respond to large-scale shocks. In response to the emergency, governments across Latin America and the Caribbean implemented more than 468 social protection measures, either through expanding coverage, which included increasing the amount of cash transfers, adjusting existing programmes and designing new ones. It is estimated that cash and in-kind transfer[bf] measures reached an average of 64.4 percent of the population since the onset of the pandemic (111.5 million households, representing 422 million

[bf] In-kind transfers are also a tool widely implemented in the region. They can be very important in remote areas where market functioning is limited, and they can ensure that people have access to nutritious foods.

people), supported by estimated investments of USD 89.7 billion in 2020 and USD 45.3 billion in 2021.[451] In 2022, similar measures were adopted to mitigate the effects of rising prices for food and other essential items.[452]

The significant role of national social protection systems and programmes to address and mitigate the impact of the COVID-19 pandemic on livelihoods increased the understanding of their potential for delivering anticipatory action to households on a larger scale in the future.[453]

However, further efforts are still needed to ensure that these systems are comprehensive, adequate and shock-responsive, so they can expand or adapt quickly and in a timely manner in crisis contexts. This includes shocks caused by the effects of climate variability and extremes, particularly in the most climate-vulnerable countries. In countries with greater vulnerability to suffering the effects of climate variability and extremes (CHAPTER 5), it is urgent to ensure adequate budget levels for the implementation of regular transfer programmes and close gaps in the coverage of the population in the most vulnerable conditions.[454] Additionally, it is important to implement solid and updated social registries and information systems (BOX 18), while also promoting greater coordination and intersectoral synergies, for example, through programmes to promote family farming, health, education and professional training, as well as working with organizations responsible for disaster risk management and early-warning systems.

BOX 18

SOCIAL REGISTRIES FOR SOCIAL PROTECTION AND CLIMATE ADAPTATION IN THE DOMINICAN REPUBLIC

The Dominican Republic has a social registry that integrates information on social vulnerability to climate threats or shocks. The National Beneficiary Registration System (SIUBEN) is the government entity responsible for identifying and prioritizing families eligible to receive benefits from public social programmes. The SIUBEN manages the Universal Social Registry of Households and the Registry of Beneficiaries.

As part of its adaptive social protection approach, SIUBEN developed the Climate Shock Vulnerability Index, which includes variables that indicate the degree of social vulnerability and exposure to climate risks at the household level. The variables are: i) characteristics of the house; ii) economic aspects of the household (income); and iii) proximity of the house to a source of danger (for example, rivers, streams). This facilitates the pre-identification of households in a situation of social vulnerability that have a high probability of being affected by a specific climate phenomenon, and thus determines intervention priorities for irrigation management organizations, local governments and the national government.

In 2023, the system covered 85 percent of the country’s households (including rural households) and can be used to guide anticipatory actions against climate threats or shocks.[455]

Social protection programmes should be integrated into sectoral agrifood system policies for greater impact on food security and nutrition in the context of climate change and extremes. Finally, social protection also contributes to climate mitigation by promoting sustainable agricultural practices and by helping to address the adverse social impacts of mitigation measures and green transitions.[456]

i) Social protection measures aimed at producers in vulnerable situations to protect income and livelihoods

Social protection systems strengthen the resilience of vulnerable populations, not only by guaranteeing access to food but also by ensuring the sustainability of their livelihoods in the long-term by promoting their productive inclusion. In particular, social protection promotes simultaneously adaptive capacities and economic inclusion through supporting: i) the adoption of climate adaptive agricultural practices and technologies; ii) the diversification of income sources and livelihoods, both on-farm and off-farm; and iii) sustainable natural resource management and ecosystem restoration.[457] However, family farmers, as well as the rural population in general, face various limitations in accessing social protection systems,[458] so it is essential that the working and living conditions of workers and the rural population, as well as their risks and specific vulnerabilities, are considered in the design and implementation of programmes.

Brazil, through the federal artisanal fishers unemployment insurance programme "Seguro-Defeso", established by Law No. 8 287 of 1991, provides financial compensation to commercial artisanal fishers (not subsistence artisanal fishers) for the loss of income due to the impossibility of carrying out the activity during the closed season. The Seguro-Defeso establishes the payment of a minimum monthly salary (for up to five months a year) to artisanal fishers during the closed season. To access this benefit, it is necessary to be registered in the general fisheries registry for at least one year, carry out fishing activities on land or with small boats, contribute to social security as a "special beneficiary" of Brazil's national social security Institute, and not receive benefits from other social programmes.[bg] Seguro-Defeso is a programme that combines environmental and social objectives, since, in addition to financially compensating fishers and encouraging them to comply with the ban, it also seeks to prevent overfishing and guarantee the conservation of various species of fish and crustaceans, among others, thereby contributing to the sustainability of the fishing sector. This programme is linked with the regulation of fishing activity and unemployment insurance, which is one of the key programmes of the Brazilian social protection system.[459]

Similarly, in Paraguay, the assistance programme for fishers in the national territory provides monetary compensation during the closed fishing season to fishers in situations of poverty, extreme poverty or vulnerability. The subsidy is provided per household and varies according to its size. The recipient must demonstrate that their sole daily task is the extraction of fish species from rivers and streams in the country. They must not be receiving any other type of monetary assistance from the state[bh] and must not be employed as salaried workers in the public or private sector.[460]

[bg] Except for benefits due to accident, illness, confinement or death. Also, if the fisherman receives payments through the Bolsa Família, a conditional cash transfer programme, these are suspended during the period covered by the Seguro-Defeso.
[bh] Except for Indigenous fishers for whom this requirement is waived.

For producers, especially those in more vulnerable situations, to prepare for climate variability and extremes and recover from their impacts, it is necessary to strengthen adaptation and mitigation capacities.[461] In this regard, improving coherence between social protection programmes and climate adaptation policies will increase the effectiveness and inclusivity of climate adaptation measures.[462,463]

The Economic Inclusion Programme for Families and Rural Communities (ACCESOS) in the Plurinational State of Bolivia promoted climate adaptation in the face of disasters, such as drought and flooding, and supported the implementation of agricultural systems adapted to the varied conditions of the highlands, inter-Andean valleys and some lowland areas.[464] The programme focused on people facing food insecurity, small-scale women farmers, youth and Indigenous Peoples. The project increased participants' incomes by 13 percent and increased their ability to recover from climate crises by 4 percent. In addition, the income of households headed by women increased by 38 percent and the value of their agricultural production by 35 percent.[465] Currently, the country is implementing ACCESOS Rural, aimed at increasing the income and climate resilience of over 19 000 small-scale rural producers who face higher levels of economic and social vulnerability, in accordance with the Plurinational State of Bolivia's Sectoral Plan for Integral Development in the Agricultural Sector. ACCESOS Rural provides training activities and subsidies to finance projects for climate change adaptation.[466]

Furthermore, it is important to carry out environmentally sustainable interventions that link producers with social protection systems, with the purpose of creating the conditions for both social inclusion and productive and economic inclusion. It is especially important to establish synergies between social, agricultural and environmental protection measures. For instance, instruments such as payments for environmental services can encourage the adoption of sustainable land and water management practices, as well as productive agrifood systems, by passing direct benefits to land users and promoting greater investment.

For instance, the Bolsa Verde programme in Brazil, provides top-up cash payments mainly to participants of the national social cash-transfer programme Bolsa Familia who reside in an eligible priority rural area in exchange for complying with the environmental conservation requirement of maintaining forest cover of 80 percent. If the forested area falls below that threshold, households residing within it have their benefit suspended. Similarly, the Bolsa Floresta programme in Brazil combines conditional payments and livelihood-focused investments to conserve forests in 15 protected areas of the Brazilian state of Amazonas. Estimates showed that deforestation is lower inside areas that benefit from the programmes.[467]

ii) Social protection measures aimed at the population in the most vulnerable situation to ensure food security and nutrition

Social protection systems, by mitigating the effects of shocks and supporting inclusive adaptation, play a crucial role in strengthening the resilience of populations in vulnerable conditions against climate variability and extremes. Social protection programmes are the most effective way to generate positive impacts on the food security and nutrition of their participants. If carefully designed and implemented, these programmes can increase total household food consumption and improve dietary diversity and nutritional outcomes. Indirectly, they can also have positive effects on local economies and agricultural performance, since they can alleviate liquidity and credit constraints.[468]

It is key that these measures reach people who are living in poverty or who are more vulnerable from a nutritional point of view. Given the effect of malnutrition on children, it is essential to guarantee coverage of households with children, as well as groups facing higher levels of vulnerability such as pregnant or lactating women, older adults or people with disabilities, Indigenous Peoples, migrants and displaced persons, and informal economy workers.[469]

In April and May 2024, heavy rains resulted in severe flooding in the Brazilian state of Rio Grande do Sul, affecting some 2 million people. Among the measures implemented were: i) upcoming instalments of several benefits, including for low-income families (Bolsa Familia) were brought forward by one month; ii) more than 21 000 additional families became eligible for social assistance due to income loss caused by the floods and were enrolled into Bolsa Familia; iii) operational adaptations such as protocols for accessing payments despite lost benefit cards and identity documents and mobile payment trucks served locations where banks were flooded; and iv) one-off reconstruction payments of USD 1 000 for approximately 240 000 families whose dwellings were in affected areas.[470]

The Supérate programme of the Dominican Republic includes the Bono de Emergencia, a temporary unconditional cash transfer. The bonus was activated in response to the emergency caused by Hurricane Fiona in 2022, covering nearly 36 000 families in poverty and vulnerability to help them recover from the devastation. In addition, other interventions included the distribution of food and non-food items, as well as the repair of infrastructure.[471, 472]

In Dominica, Tropical Storm Erica in 2015 and Hurricane Maria in 2017 had devastating impacts on people and the national economy. Following the devastating 2017 hurricane season, the government produced the National Resilience Development Strategy 2030 and the Climate Resilience and Recovery Plan 2020–2030. The former sets out social development, social protection and poverty reduction as key contributors to climate resilience, with social protection featuring as one of the seven development objectives of the National Resilience Development Strategy. In response to Hurricane Maria in 2017, the government implemented a horizontal and vertical expansion of the Public Assistance Programme (PAP), the main social protection programme targeting the population in extreme poverty, to deliver emergency cash transfers. The expansion of the PAP allowed for the provision of three monthly payments of USD 90 per household, with additional payments of USD 50 per child for up to three children, benefiting close to 25 000 people for a total of 7 500 households.[473]

It should be noted that cash transfers alone do not guarantee that resources are allocated to the purchase of nutritious foods that are part of a healthy diet. Although the proper functioning of local markets is a determining factor, these programmes could be complemented with additional actions in nutritional education, as effects are mixed.[474] The integration of food and nutrition education and behaviour changes encourages caring practices, food consumption and eating patterns that meet dietary recommendations.[475] Specifically, combining nutrition education with cash transfers can influence food preferences and decisions to promote the consumption of nutritious foods, encourage the adequate distribution of food in the household to meet the particular needs of each member, including pregnant and lactating women, children and people with disabilities, and promote other improved practices related to child feeding, care, sanitation and hygiene, as well as access to and use of health services.[476]

Social protection programmes also have the potential to include productive inclusion components or interventions, which allows for the double inclusion – social and productive – of participants. Furthermore, these programmes have the potential to link interventions that simultaneously seek to reduce poverty and promote resilience.

Paraguay has been implementing the Poverty, Reforestation, Energy and Climate Change Project (PROEZA) since 2020. This project represents Paraguay's first effort to address its nationally determined contributions through the Green Climate Fund. PROEZA combines poverty reduction, reforestation, renewable energy, and climate change objectives based on a comprehensive sustainable development strategy. Under Component 1,[bi] it targets beneficiaries of the national conditional cash transfer programme Tekoporã as recipients of the project's environmental conditional cash transfer. This innovative approach allows beneficiaries to receive incentives to improve their environmental resilience and generate public benefits.[477]

B. Agricultural insurance for family farmers and small-scale producers as a risk transfer mechanism

Small-scale producers and family farmers often face financial constraints, which limit their access to credit and inputs for risk reduction and management. Most of their resources are allocated to family subsistence and the purchase of essential inputs for the continuity of production.[478] Therefore, their lack of resilience in the face of extreme climate events or the impacts of climate variability reduces their income, decreases their production and affects food security.[479]

In this context, agricultural insurance is presented as a tool that contains the impacts of climate variability and extremes on food production, and that, when combined with risk reduction practices, can contribute to strengthening the resilience of producers, especially those in a more vulnerable situation. Agricultural insurance is a financial tool through which risks are transferred to insurance companies or the state (when acting as such), thus reducing the possible impact of losses on agriculture and livelihoods, and contributing to stabilizing the income of insured producers, thereby allowing the recovery of productive activities and helping to maintain the availability, access and stability of food. This increases the resilience of producers to the impacts of climate variability and extremes and contributes to strengthening food security. In addition to these benefits, agricultural insurance facilitates access to other financial instruments, such as credit, through which agricultural activity can be enhanced and, consequently, contributes to food availability.[480]

[bi] PROEZA has three main components.

It is important to note that insurance transfers the loss from one actor to another with a greater coping capacity, but it does not reduce the loss itself.[481] However, when based on forecasts, insurance can be activated in anticipation to plan for and respond to hazards.[bj] This allows small-scale producers and family farmers to implement anticipatory actions to be better prepared, thereby protecting their livelihoods.

In various Latin American countries, agricultural insurance schemes have been implemented, including insurance for family farming. In all these cases, the public sector has played a key role in ensuring the viability, development, implementation and sustainability of these schemes. The state can play different roles and, depending on its level of participation, different agricultural insurance schemes can be identified. These range from products with marginal state involvement, as in the case of insurance that is entirely developed and managed by the private sector and that is contracted without the participation of the state, to a scheme where the state assumes the role of second level insurer and covers all costs associated with the design, implementation and financing. There is also the possibility of a mixed scheme in which the public sector partners with the private insurance sector.[482]

In 2022, Guatemala formalized the implementation of agricultural insurance (parametric and catastrophic) aimed at protecting small-scale agricultural producers – who have improved their practices, produced surpluses and started a marketing process – before the occurrence of intense rains and prolonged drought. Under this programme, the Ministry of Agriculture purchases a single insurance policy that includes large numbers of family farmers as the primary beneficiaries, and fully funds the costs of the insurance premiums.[483] To this end, the Ministry acquired an insurance policy with the Banco Crédito Hipotecario Nacional with the goal of covering 40 000 family farmers.[484] Subsequently, through Ministerial Agreement No. 78-2023, the "Catastrophic insurance conceptual document for small-scale farmers" was approved, with the main objective of promoting the resilience of family farmers through the implementation of catastrophic insurance to allow economic reactivation in case of adverse climate events that put their assets at risk and prevented productive activity from being maintained or enhanced.[485] As of 2023, the programme protects 100 000 family farmers in Guatemala against excess rain and drought, which could severely impact their livelihoods.[486]

Also in Guatemala, financial inclusion has been considered a fundamental aspect of the PRO-Resilience Programme (2020–2025) and has been strengthened by contracting 14 731 insurance policies designed to protect producers, mostly women (88 percent) who are most vulnerable to drought and excessive rainfall, establishing an economic security system that guarantees financial support to face crisis situations. In 2023, 5 337 families benefited from these insurance policies, receiving assistance for excessive rainfall or drought, which helped strengthen their economic recovery capacity.

[bj] This scheme is known as anticipatory insurance, which triggers payments before damage occurs, based on early-warnings systems. Some pilot programmes are being implemented in Africa. See Maslo, D. 2022. How anticipatory insurance can help Africa better prepare and respond to disasters. In: Prevention Web. [Accessed August 10 2024]. https://www.preventionweb.net/news/how-anticipatory-insurance-can-help-africa-better-prepare-and-respond-disasters; and for the Pacific see UNDRR. n.d. Pacific's first anticipatory action pilot insurance scheme to provide Fijian farming groups with funds to better prepare for cyclones. In: UNDRR. [Accessed August 10 2024]. https://www.undrr.org/news/pacifics-first-anticipatory-action-pilot-insurance-scheme-provide-fijian-farming-groups-funds

Brazil is one of the pioneers in the development of a public insurance model for family farming. For example, the Garantia-Safra Programme (Harvest Guarantee Programme) – part of the National Programme for Strengthening Family Farming (PRONAF) – created by Law No. 10,420 of 2002,[bk] is a federal agricultural insurance programme that provides payments to family farmers who experience at least 50 percent losses in the production of a set of their crops due to climatic extremes, such as drought or excess rain, in order to improve their risk management and monitoring capabilities. Family farmers who have a Declaration of Active Aptitude from PRONAF, have a monthly family income of a maximum of 1.5 minimum wages, and plant between 0.6 and 5.0 hectares of beans, corn, rice, cotton or cassava can access the insurance.[487,bl]

Agricultural insurance is an important tool to strengthen the resilience of the agrifood sector. By transferring risks, it protects the livelihoods of producers and contributes to food security in the region, especially in a context of increasing climate variability and extremes. Exposure to these risks can result in significant losses for producers, especially small-scale producers who lack access to credit and inputs for risk management. Its effective and sustainable implementation requires continuous collaboration between the public sector, the private sector and other relevant actors. In addition, these insurance policies can facilitate access to other financial instruments such as loans, which enhances agricultural activity and protects food security as well.

It is important for countries to continue advancing in the development of innovative and affordable risk management tools, with a focus on small-scale producers and family farmers. Given their essential role in food security and climate risks, there is a demand for the creation of tools that reduce the vulnerability of countries (BOX 19).

[bk] Brazil. Garantia-Safra Programme, April 10, 2002. No. 10,420. Also available at: [https://www.planalto.gov.br/ccivil_03/leis/2002/L10420.htm]"

[bl] For other experiences from Brazil, see: FAO. 2016. Climate change, food security and insurance systems for family farming. Brazilian case: Climate, income and price insurance programmes. Rome. https://www.fao.org/3/i6199e/i6199e.pdf

BOX 19

OTHER CLIMATE RISK FINANCING OPTIONS FOR POPULATIONS IN VULNERABILITY

Financing for shock-driven food crisis facility

Currently being designed in close coordination with FAO, WFP, and the UN Office for the Coordination of Humanitarian Affairs (UNOCHA), this catastrophic insurance facility aims to involve private capital from global insurance markets, providing rapid-response financing in anticipation of severe food crises. The facility represents a global effort to support anticipatory action and rapid-response funding in the face of high levels of acute food insecurity. At its core, it utilizes advancements in science to assess hazards and exposure to risks, enabling efficient and effective parametric insurance for 12 distinct hazards. The facility combines innovative and blended financing mechanisms, leveraging contributions from donors, the private sector, and investment funds to extend coverage across more hazards and regions. Through the use of catastrophe insurance instruments and methodologies, it aims to strengthen resilience among the most vulnerable populations.[488, 489]

Global Shield against Climate Risks

The Global Shield against Climate Risks is an initiative led by the Group of Seven Countries and the Vulnerable Twenty Group aimed at improving financial resilience for climate-vulnerable countries. By deploying pre-arranged financial tools, it aims to provide timely support following climate-related impacts. The initiative combines donor and private funds to address protection gaps and accelerate response times, supporting economic recovery and resilience building in affected regions.

The Global Shield offers: i) premium and capital support; ii) financial instruments (such as risk transfer products, credit guarantees, contingent credits, parametric and forecast-based finance for anticipatory action); and iii) technical support (such as risk analytics, capacity building, strengthening regulatory frameworks, integrating early-warning systems, and linking to social protection systems as a disbursement mechanism).

Initially active in eight countries, it includes Costa Rica, Jamaica, and Peru from the region.[490]

CONCLUSIONS

The 2024 edition of the L*atin America and the Caribbean Regional Overview of Food Security and Nutrition* provides updated information on regional progress towards achieving the goals of ending hunger (SDG Target 2.1) and all forms of malnutrition (SDG Target 2.2).

The latest estimates for Latin America and the Caribbean show two consecutive years of reductions in the prevalence of both undernourishment and food insecurity, being the only region with this trend globally. These improvements are largely due to economic recovery and robust social protection systems, in particular in some South American countries, which allowed them to effectively respond to crises, such as the COVID-19 pandemic and the subsequent years of socioeconomic emergency. Furthermore, data from 2023 indicates a decrease in the levels of poverty, extreme poverty and inequality (as measured by the Gini index), alongside an increase in general employment levels and minimum wage adjustments.

Despite this progress, significant disparities persist across subregions, and inequalities continue to impact food security and nutrition among the most vulnerable populations. Moreover, the region is not on track to meet most nutrition targets, and while the affordability of a healthy diet has improved, it continues to have the highest cost in the world compared to other regions.

The 2021 edition of *The State of Food Security and Nutrition in the World* presents an analysis of the major drivers that explain food security and nutrition trends globally: conflict, climate variability and extremes, and economic slowdowns and downturns combined with underlying structural factors, such as the lack of access to and unaffordability of healthy diets, growing inequalities and unhealthy food environments. These major drivers are increasing in frequency and intensity, often occurring simultaneously, with interactions that create multiple compounding impacts on agrifood systems that threaten to undermine and reverse progress towards eliminating hunger and malnutrition.

In Latin America and the Caribbean, economic slowdowns are a key factor affecting food security and nutrition. Countries experiencing economic downturns exhibit both the highest prevalence of undernourishment and the most substantial increase in undernourishment. However, despite economic contractions during the pandemic years, there has been a reduction in terms of poverty and inequality associated with economic recovery, which, together with social protection measures, helped improve food security indicators in the region. Therefore, it is important to take a closer look at the other relevant drivers.

Of the countries in the region, 74 percent have high exposure to climate extremes, meaning these events occur with greater frequency and intensity. Additionally, 52 percent of countries can be considered vulnerable to climate extremes, experiencing rising temperatures, particularly in the Caribbean. Therefore, climate variability and extremes, exacerbated by climate change, pose important challenges for food security and nutrition now and in the future. For that reason, the theme of this year's report is focused on the potential impact of climate variability and extremes on food security and nutrition.

The prevalence of undernourishment in the region has been decreasing since 2022. In 2023, it was estimated at 6.2 percent, significantly lower than the global estimate (9.1 percent) but still above pre-pandemic levels. In 2023, 41 million people in the region were undernourished, which represents a reduction of 2.9 million people compared to 2022 and 4.3 million people compared to 2021 (however, 4.7 million more people compared to 2019). Estimates show significant differences by subregion. The prevalence of undernourishment has been rising over the past two years in the Caribbean, while it has remained relatively unchanged in Mesoamerica and has decreased in South America.

The prevalence of food insecurity has also decreased for the second consecutive year in the region. In 2023, moderate or severe food insecurity affected 28.2 percent of the population (187.6 million people), being the first time in recent years that the regional prevalence is below the global average (28.9 percent), while severe food insecurity affected 8.7 percent of the population (58.1 million people). It is worth mentioning that moderate or severe food insecurity decreased across all three subregions, while severe food insecurity increased only in the Caribbean. In addition, 2023 levels of moderate or severe food insecurity are close to those seen in 2019. However, the prevalence of food insecurity in both degrees of severity continues to disproportionately impact different subgroups of the population, such as women and rural populations.

The double burden of malnutrition continues to be a development challenge in the region. The prevalence of stunting in children under 5 years of age has decreased since 2000, reaching 11.5 percent in 2022, which is half the global prevalence (22.3 percent); however, the downward trend has slowed over time. In addition, the prevalence of overweight in children under 5 years of age is above the global estimate, and this indicator has been increasing faster in Latin America and the Caribbean than in the world, primarily driven by increases in South America. Similarly, little progress has been made in halting the rise of obesity in adults. In Latin America and the Caribbean, the prevalence almost doubles the global estimate, rising from 15.4 percent in 2000 to 29.9 percent in 2022, affecting 141.4 million adults and showing an increase across all subregions. Regarding exclusive breastfeeding among infants under 6 months of age, despite progress made in Latin America and the Caribbean between 2012 and 2022, the prevalence in the region (43.1 percent) and across all three subregions remained below the global estimate (48 percent).

The average cost of a healthy diet in the region is estimated at 4.56 PPP dollars per person per day, the highest compared to other regions in the world and above the world average (3.96 PPP dollars). The regional cost of a healthy diet increased by 11.8 percent compared to 2021, and 26.3 percent compared to 2017. The Caribbean is the subregion with the highest cost at 5.16 PPP dollars per person per day. In 2022, 182.9 million people in Latin America and the Caribbean could not afford a healthy diet. This represents a decrease of 2.4 percentage points compared to 2021, meaning 14.3 million more people were able to afford a healthy diet.

The 2030 Agenda for Sustainable Development envisions a healthier, fairer, and more equitable world – one free from poverty, hunger, and malnutrition – guided by three core pillars: social, economic and environmental sustainability, which steer global efforts towards a sustainable and inclusive future. However, we have already exceeded six of the nine planetary boundaries, meaning that climate variability and extremes will intensify, making it more challenging to achieve the desired outcomes through the actions and policies implemented.

The region, like the rest of the world, faces a complex scenario due to a series of recurrent and simultaneous crises, which have contributed to rising food prices, threatening the functioning, efficiency and resilience of agrifood systems and, therefore, impacting progress in meeting the SDG 2.1 and 2.2 targets. However, recent improvements in terms of poverty, inequality and employment suggest that a greater focus on other drivers of hunger and malnutrition, such as climate variability and extremes, is necessary to sustain progress.

Over recent decades, the frequency of these extreme climate events (including drought, flooding and storms) has significantly increased in Latin America and the Caribbean, with effects that are uneven across subregions, countries and territories, with some areas, like the Caribbean, being particularly hard-hit and facing the highest number of affected people per event, or the Dry Corridor in Mesoamerica, where drought has led to significant food insecurity.

Climate variability and extremes produce diverse impacts on agrifood systems, as well as on all dimensions of food security – availability, access, utilization and stability – and the underlying causes of malnutrition. As the data demonstrates, climate extremes, such as drought, flooding and storms, have disrupted agricultural productivity, which suffers due to crop losses or reduced production, and the functioning of domestic food supply chains due to disruptions in infrastructure, transport and food distribution. These disruptions not only diminish food availability but also produce changes in consumption patterns and a reduction in access to and affordability of healthy diets due to the increase in consumer food prices and income losses. This is particularly the case for people whose livelihoods depend on agriculture and natural resources, thereby affecting the income and purchasing power of the population, especially of lower income households that allocate a greater proportion of their income to food, which in turn exacerbates existing inequalities.

Concerted actions must urgently be made to transform agrifood systems, making them more efficient, inclusive, resilient and sustainable. Underlying structural factors such as lack of access to and unaffordability of nutritious foods, unhealthy food environments, and high and persistent inequality further worsen the negative effects of climate variability and extremes on food security and nutrition. The region's high exposure to climate-related risks, combined with persistent poverty and inequality, has created an urgent need for inclusive and resilient agrifood systems.

To address climate variability and extremes, policymakers should adopt more integrated portfolios of policies and actions that contribute to developing the five capacities for resilience building (anticipate, prevent, absorb, adapt and transform), which are central to enabling the transformation of agrifood systems. A holistic approach should include policies and actions to address the underlying structural factors that exacerbate the negative impacts of climate variability and extremes.

There are several cross-cutting factors that are crucial to implementing this approach, as well as tools and interventions that can be tailored to specific contexts. Ultimately, fostering resilient agrifood systems in Latin America and the Caribbean will require an integral approach.

This edition highlights a set of policies and actions being implemented in countries of Latin America and the Caribbean that are directly related to climate variability and extremes and their impacts on food supply chains, such as early-warning systems, climate risk monitoring, sustainable and diversified production and diversification of the food supply of importing countries. In addition, the report analyses a series of complementary policies aimed at preventing increases in food insecurity and malnutrition, while addressing underlying structural factors. These include fiscal policies and school feeding programmes to improve access to and affordability of nutritious foods, front-of-package nutritional labelling systems to promote healthier food environments, and social protection programmes and agricultural insurance for family farmers and small-scale producers to reduce inequality gaps.

Finally, there is a pressing need for more research and evaluations to address the evidence gap on how policies can effectively reduce the impacts of climate variability and extremes on food security and nutrition, particularly within agrifood systems. Region-specific data is crucial for developing effective policies and actions that support agrifood system actors and vulnerable populations, while enhancing climate resilience. As climate variability and extremes accelerate, current data collection efforts are falling behind, making it vital to improve data dynamism to inform more targeted and effective interventions. Without a robust data foundation, it is difficult to design strategies that adequately address the challenges posed by climate variability and extremes.

Continuing with the reduction of hunger and food insecurity in Latin American and the Caribbean, moving forward and achieving SDG Targets 2.1 and 2.2 – ending hunger, food insecurity, and malnutrition by 2030 – requires transformative change. The evolution and transformation of agrifood systems in the coming decades will have implications for health, socioeconomic well-being, and the environment. Greater effort is required to ensure that the objectives of actions across and within sectors such as the environment, food and nutrition, agriculture, health and social development, among others, are aligned to address the negative impacts and threats posed by climate variability and extremes. Accelerated action on resilience is critical to addressing immediate challenges and ensuring long-term progress towards food security and nutrition for all.

ANNEX I
DATA TABLES

TABLE A-1
Prevalence of undernourishment (percent)

	2000–2002	2004–2006	2009–2011	2014–2016	2018–2020	2019–2021	2020–2022	2021–2023
World	**13.0**	**12.0**	**8.7**	**7.5**	**7.8**	**8.3**	**8.9**	**9.1**
Latin America and the Caribbean	10.3	8.9	6.4	5.4	6.0	6.3	6.7	6.6
Caribbean	17.5	18.1	14.9	12.9	14.3	14.9	15.9	16.5
Mesoamerica	7.2	7.6	6.7	6.3	5.7	5.7	5.8	5.8
South America	10.8	8.4	5.4	4.3	5.2	5.7	6.1	5.9
Antigua and Barbuda	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Argentina	2.9	3.6	3.6	2.8	3.5	3.4	3.3	3.2
Bahamas	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Barbados	5.9	5.7	3.0	<2.5	2.9	3.5	3.9	3.5
Belize	5.8	5.2	5.4	6.3	4.5	4.4	4.3	4.6
Bolivia (Plurinational State of)	26.4	27.5	20.1	16.8	14.5	16.9	20.3	23.0
Brazil	10.4	6.2	3.5	<2.5	<2.5	3.4	4.2	3.9
Chile	3.2	3.0	3.7	3.3	2.7	<2.5	<2.5	<2.5
Colombia	8.6	11.1	11.3	5.1	4.3	4.4	4.2	4.2
Costa Rica	4.3	3.4	3.0	<2.5	<2.5	<2.5	<2.5	<2.5
Cuba	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Dominica	<2.5	2.7	3.8	7.0	11.9	13.4	14.0	13.4
Dominican Republic	20.5	19.3	13.5	7.4	6.3	6.2	5.8	4.6
Ecuador	20.1	21.5	11.5	8.5	12.6	13.6	14.0	13.9
El Salvador	6.7	8.6	9.2	9.2	6.9	6.6	7.1	6.8
Grenada	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Guatemala	22.5	19.3	15.7	15.6	14.1	13.6	13.2	12.6
Guyana	6.0	6.6	8.7	4.4	2.8	2.6	<2.5	<2.5
Haiti	48.1	50.8	41.1	38.3	43.6	45.1	48.2	50.4
Honduras	21.2	21.5	15.9	15.0	14.0	15.8	18.4	20.4
Jamaica	7.2	7.5	8.5	7.9	6.7	7.0	7.6	7.3
Mexico	3.0	4.1	4.1	3.7	3.5	3.2	3.2	3.1
Nicaragua	25.9	21.8	19.5	19.3	17.8	18.7	19.2	19.6
Panama	23.6	20.6	9.8	7.0	4.4	4.7	5.1	5.6
Paraguay	9.9	7.0	<2.5	<2.5	3.1	3.4	3.9	4.5
Peru	20.3	17.7	8.5	5.8	6.5	6.7	7.1	7.0
Saint Kitts and Nevis	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Saint Lucia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Saint Vincent and the Grenadines	13.8	8.2	6.0	5.2	5.9	6.1	5.8	4.8
Suriname	11.1	9.2	7.9	9.1	9.1	9.3	9.8	10.1
Trinidad and Tobago	9.6	10.8	8.1	6.8	9.1	11.2	12.8	12.6
Uruguay	3.2	2.7	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Venezuela (Bolivarian Republic of)	14.1	7.8	<2.5	11.1	23.9	22.2	20.0	17.6

Notes: The 2021–2023 average values reflect 2023 projections that are based on nowcasts. n.a. = data not available; n.r. = not reported.
Source: 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.

TABLE A-2
Number of undernourished people (millions)

	2000–2002	2004–2006	2009–2011	2014–2016	2018–2020	2019–2021	2020–2022	2021–2023
World	**807.3**	**788.3**	**605.7**	**559.0**	**602.5**	**653.1**	**700.6**	**722.0**
Latin America and the Caribbean	54.8	49.7	37.7	33.7	38.7	41.3	43.8	43.4
Caribbean	6.8	7.2	6.2	5.5	6.3	6.6	7.0	7.3
Mesoamerica	9.8	11.1	10.5	10.5	10.0	10.0	10.3	10.5
South America	38.2	31.4	21.1	17.7	22.4	24.7	26.5	25.6
Antigua and Barbuda	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Argentina	1.1	1.4	1.5	1.2	1.6	1.5	1.5	1.4
Bahamas	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Barbados	<0.1	<0.1	<0.1	n.r.	<0.1	<0.1	<0.1	<0.1
Belize	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bolivia (Plurinational State of)	2.3	2.6	2.1	1.9	1.7	2.0	2.5	2.8
Brazil	18.5	11.7	7.0	n.r.	n.r.	7.2	9.0	8.4
Chile	0.5	0.5	0.6	0.6	0.5	n.r.	n.r.	n.r.
Colombia	3.4	4.7	5.1	2.4	2.1	2.2	2.2	2.2
Costa Rica	0.2	0.1	0.1	n.r.	n.r.	n.r.	n.r.	n.r.
Cuba	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Dominica	n.r.	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dominican Republic	1.8	1.8	1.3	0.8	0.7	0.7	0.6	0.5
Ecuador	2.6	3.0	1.7	1.4	2.2	2.4	2.5	2.5
El Salvador	0.4	0.5	0.6	0.6	0.4	0.4	0.4	0.4
Grenada	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Guatemala	2.7	2.5	2.3	2.5	2.4	2.4	2.3	2.3
Guyana	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	n.r.	n.r.
Haiti	4.1	4.6	4.0	4.0	4.9	5.1	5.5	5.8
Honduras	1.5	1.6	1.3	1.4	1.4	1.6	1.9	2.1
Jamaica	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mexico	3.0	4.4	4.6	4.5	4.3	4.1	4.0	3.9
Nicaragua	1.3	1.2	1.1	1.2	1.2	1.3	1.3	1.4
Panama	0.7	0.7	0.4	0.3	0.2	0.2	0.2	0.2
Paraguay	0.5	0.4	n.r.	n.r.	0.2	0.2	0.3	0.3
Peru	5.5	5.0	2.5	1.8	2.1	2.2	2.4	2.4
Saint Kitts and Nevis	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Saint Lucia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Saint Vincent and the Grenadines	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Suriname	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Trinidad and Tobago	0.1	0.1	0.1	<0.1	0.1	0.2	0.2	0.2
Uruguay	0.1	<0.1	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Venezuela (Bolivarian Republic of)	3.5	2.1	n.r.	3.4	7.0	6.3	5.7	5.0

Notes: The 2021–2023 average values reflect 2023 projections that are based on nowcasts. n.a. = data not available; n.r. = not reported, as the prevalence is less than 2.5 percent.
Source: 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.

TABLE A-3
Prevalence of food insecurity (percent)

	Severe food insecurity				Moderate or severe food insecurity			
	2014–2016	2017–2019	2019–2021	2021–2023	2014–2016	2017–2019	2019–2021	2021–2023
World	**7.6**	**8.7**	**10.3**	**10.9**	**21.7**	**24.4**	**27.7**	**29.0**
Latin America and the Caribbean	7.0	8.6	10.6	10.6	25.1	28.9	32.6	31.3
Caribbean	n.a.	n.a.	29.4	27.5	n.a.	n.a.	61.5	59.6
Mesoamerica	6.4	6.9	7.4	7.8	28.9	28.4	31.7	29.3
South America	4.7	6.9	10.0	10.0	19.7	25.9	30.0	29.2
Antigua and Barbuda	n.a.	n.a.	7.1	7.1	n.a.	n.a.	33.0	33.0
Argentina	5.8	12.9	13.0	13.1	19.2	35.8	37.0	36.1
Bahamas	n.a.	n.a.	3.4	3.4	n.a.	n.a.	17.2	17.2
Barbados	n.a.	n.a.	7.4	7.4	n.a.	n.a.	31.1	31.1
Belize	n.a.	n.a.	6.0	5.9	n.a.	n.a.	42.3	45.5
Bolivia (Plurinational State of)	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Brazil	0.7	1.1	6.3	6.6	13.3	14.2	19.4	18.4
Chile	2.9	3.6	3.8	3.7	10.8	15.3	17.4	17.6
Colombia	4.9	4.6	5.0	5.3	20.0	26.5	30.5	30.7
Costa Rica	1.8	2.4	2.8	2.8	12.2	14.5	15.9	16.2
Cuba	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Dominica	n.a.	n.a.	5.8	5.8	n.a.	n.a.	34.4	34.4
Dominican Republic	24.3	22.4	22.2	19.0	54.2	52.6	53.1	46.1
Ecuador	6.0	9.9	12.8	12.7	20.7	29.3	36.8	36.9
El Salvador	13.8	14.6	14.7	15.8	42.2	42.2	46.5	46.9
Grenada	n.a.	8.3	7.5	5.8	n.a.	23.6	22.3	19.9
Guatemala	16.1	18.1	20.7	21.1	42.7	45.2	55.8	59.8
Guyana	n.a.	n.a.	n.a.	4.7	n.a.	n.a.	n.a.	25.5
Haiti	n.a.	n.a.	45.2	42.4	n.a.	n.a.	82.5	82.8
Honduras	14.2	14.0	17.9	26.9	41.6	40.9	49.9	56.0
Jamaica	25.3	23.0	23.1	26.6	48.3	45.8	50.3	55.1
Mexico	3.4	3.8	3.5	3.0	24.9	23.8	25.5	20.7
Nicaragua	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Panama	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Paraguay	1.2	4.1	5.6	6.6	8.3	21.3	25.3	26.2
Peru	13.5	18.0	20.5	20.3	37.2	44.9	50.5	51.7
Saint Kitts and Nevis	n.a.	8.1	6.4	5.6	n.a.	21.1	26.9	29.8
Saint Lucia	4.5	n.a.	n.a.	4.5	22.2	n.a.	n.a.	22.2
Saint Vincent and the Grenadines	n.a.	10.3	10.3	10.3	n.a.	33.3	33.3	33.3
Suriname	n.a.	n.a.	7.2	7.2	n.a.	n.a.	35.8	35.8
Trinidad and Tobago	n.a.	n.a.	10.2	10.2	n.a.	n.a.	43.3	43.3
Uruguay	n.a.	1.7	2.5	2.9	n.a.	13.3	14.1	15.7
Venezuela (Bolivarian Republic of)	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.

Note: n.a. = data not available; n.r. = not reported.
Source: 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.

TABLE A-4
Number of food-insecure people (millions)

	Severe food insecurity				Moderate or severe food insecurity			
	2014–2016	2017–2019	2019–2021	2021–2023	2014–2016	2017–2019	2019–2021	2021–2023
World	**568.0**	**666.8**	**804.6**	**868.6**	**1 611.1**	**1 877.2**	**2 168.5**	**2 311.7**
Latin America and the Caribbean	43.8	54.9	69.2	70.1	156.1	185.4	212.4	206.6
Caribbean	n.a.	n.a.	12.9	12.2	n.a.	n.a.	27.1	26.4
Mesoamerica	10.6	12.0	13.1	14.1	48.3	49.1	56.0	52.6
South America	19.6	29.5	43.2	43.8	81.5	109.9	129.4	127.6
Antigua and Barbuda	n.a.	n.a.	<0.1	<0.1	n.a.	n.a.	<0.1	<0.1
Argentina	2.5	5.7	5.8	5.9	8.3	15.9	16.6	16.4
Bahamas	n.a.	n.a.	<0.1	<0.1	n.a.	n.a.	<0.1	<0.1
Barbados	n.a.	n.a.	<0.1	<0.1	n.a.	n.a.	<0.1	<0.1
Belize	n.a.	n.a.	<0.1	<0.1	n.a.	n.a.	0.2	0.2
Bolivia (Plurinational State of)	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Brazil	1.5	2.2	13.4	14.3	27.2	29.9	41.3	39.7
Chile	0.5	0.7	0.7	0.7	1.9	2.9	3.3	3.4
Colombia	2.3	2.3	2.6	2.8	9.4	13.1	15.5	16.3
Costa Rica	<0.1	0.1	0.1	0.1	0.6	0.7	0.8	0.8
Cuba	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Dominica	n.a.	n.a.	<0.1	<0.1	n.a.	n.a.	<0.1	<0.1
Dominican Republic	2.5	2.4	2.4	2.1	5.6	5.7	5.8	5.2
Ecuador	1.0	1.7	2.2	2.3	3.4	5.0	6.5	6.6
El Salvador	0.9	0.9	0.9	1.0	2.6	2.6	2.9	3.0
Grenada	n.a.	<0.1	<0.1	<0.1	n.a.	<0.1	<0.1	<0.1
Guatemala	2.6	3.1	3.6	3.8	6.8	7.6	9.7	10.7
Guyana	n.a.	n.a.	n.a.	<0.1	n.a.	n.a.	n.a.	0.2
Haiti	n.a.	n.a.	5.1	4.9	n.a.	n.a.	9.3	9.6
Honduras	1.3	1.4	1.8	2.8	3.9	4.0	5.0	5.8
Jamaica	0.7	0.6	0.7	0.8	1.3	1.3	1.4	1.6
Mexico	4.1	4.7	4.4	3.8	30.0	29.5	32.1	26.4
Nicaragua	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Panama	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Paraguay	<0.1	0.3	0.4	0.4	0.5	1.4	1.7	1.8
Peru	4.1	5.8	6.8	6.9	11.4	14.5	16.8	17.6
Saint Kitts and Nevis	n.a.	<0.1	<0.1	<0.1	n.a.	<0.1	<0.1	<0.1
Saint Lucia	<0.1	n.a.	n.a.	<0.1	<0.1	n.a.	n.a.	<0.1
Saint Vincent and the Grenadines	n.a.	<0.1	<0.1	<0.1	n.a.	<0.1	<0.1	<0.1
Suriname	n.a.	n.a.	<0.1	<0.1	n.a.	n.a.	0.2	0.2
Trinidad and Tobago	n.a.	n.a.	0.2	0.2	n.a.	n.a.	0.7	0.7
Uruguay	n.a.	<0.1	<0.1	<0.1	n.a.	0.5	0.5	0.5
Venezuela (Bolivarian Republic of)	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.

Note: n.a. = data not available; n.r. = not reported.
Source: 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.

TABLE A-5
Prevalence of food insecurity by sex (percent)

	Severe food insecurity				Moderate or severe food insecurity			
	Men		Women		Men		Women	
	2014–2016	2021–2023	2014–2016	2021–2023	2014–2016	2021–2023	2014–2016	2021–2023
World	**6.4**	**9.1**	**7.1**	**10.4**	**18.7**	**24.9**	**20.4**	**27.3**
Latin America and the Caribbean	6.3	9.2	7.4	11.6	22.7	27.2	26.7	34.4
Caribbean	n.a.	26.2	n.a.	28.9	n.a.	58.1	n.a.	61.6
Mesoamerica	5.7	6.7	6.6	8.4	27.0	24.8	30.1	32.8
South America	4.0	8.5	5.1	11.1	17.3	25.0	21.6	32.4
Antigua and Barbuda	n.a.	7.4	n.a.	6.8	n.a.	29.0	n.a.	37.0
Argentina	4.9	10.4	6.6	15.7	15.8	30.5	22.6	41.7
Bahamas	n.a.	3.6	n.a.	3.3	n.a.	17.6	n.a.	16.9
Barbados	n.a.	6.8	n.a.	8.0	n.a.	28.8	n.a.	33.3
Belize	n.a.	5.9	n.a.	5.9	n.a.	45.5	n.a.	45.5
Bolivia (Plurinational State of)	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Brazil	<0.5	5.2	1.0	8.0	11.3	14.8	15.3	22.0
Chile	2.5	3.4	3.4	4.0	9.1	15.9	12.5	19.3
Colombia	4.7	5.0	5.0	5.7	18.8	27.8	21.2	35.0
Costa Rica	1.8	2.6	1.8	3.1	11.5	13.8	12.9	18.6
Cuba	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Dominica	n.a.	5.8	n.a.	5.8	n.a.	34.4	n.a.	34.4
Dominican Republic	22.8	17.1	25.8	20.8	51.3	42.7	57.2	49.5
Ecuador	5.7	11.2	6.2	14.1	19.9	33.1	21.6	40.6
El Salvador	12.6	13.7	15.0	17.9	38.6	39.9	45.7	53.8
Grenada	n.a.	5.8	n.a.	5.8	n.a.	19.9	n.a.	19.9
Guatemala	15.3	19.6	16.8	22.6	39.9	54.0	45.4	65.6
Guyana	n.a.	4.7	n.a.	4.7	n.a.	25.5	n.a.	25.5
Haiti	47.1	40.8	50.5	44.1	81.6	81.9	83.8	83.7
Honduras	12.9	24.7	15.5	29.2	38.0	51.4	45.3	60.7
Jamaica	23.1	27.0	27.6	26.2	44.7	56.0	51.9	54.2
Mexico	3.1	2.4	3.8	3.6	23.8	17.1	26.1	24.3
Nicaragua	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Panama	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Paraguay	1.1	7.1	1.2	6.2	8.0	26.3	8.5	26.1
Peru	11.0	18.3	16.0	22.3	30.8	45.8	43.7	57.7
Saint Kitts and Nevis	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Saint Lucia	4.5	4.5	4.5	4.5	22.2	22.2	22.2	22.2
Saint Vincent and the Grenadines	n.a.	10.3	n.a.	10.3	n.a.	33.3	n.a.	33.3
Suriname	n.a.	6.2	n.a.	8.2	n.a.	31.3	n.a.	40.4
Trinidad and Tobago	n.a.	10.0	n.a.	10.4	n.a.	41.9	n.a.	44.8
Uruguay	n.a.	2.4	n.a.	3.3	n.a.	12.7	n.a.	18.7
Venezuela (Bolivarian Republic of)	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.

Note: n.a. = data not available; n.r. = not reported.
Source: 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.

TABLE A-6
Prevalence of stunting among children under 5 years of age (percent)

	2000	2005	2010	2012	2015	2019	2020	2022
World	**33.0**	**31.1**	**27.9**	**26.3**	**24.6**	**23.0**	**22.7**	**22.3**
Latin America and the Caribbean	17.8	15.7	13.6	12.7	12.1	11.8	11.7	11.5
Caribbean	15.3	14.6	13.7	13.0	12.5	11.9	11.7	11.3
Mesoamerica	25.3	22.3	19.3	18.2	17.5	17.4	17.2	16.9
South America	14.6	12.7	10.9	10.1	9.5	9.2	9.1	9.0
Argentina	9.4	7.8	7.1	7.1	7.7	8.6	8.9	9.5
Barbados	8.2	8.2	7.8	7.5	7.0	6.4	6.2	6.0
Belize	23.4	22.9	19.2	17.5	15.4	13.2	12.8	12.0
Bolivia (Plurinational State of)	32.9	29.6	22.8	19.9	16.6	13.0	12.3	11.1
Brazil	9.8	7.3	6.5	6.3	6.5	7.1	7.2	7.2
Chile	2.9	2.3	2.0	1.9	1.8	1.7	1.6	1.6
Colombia	17.4	15.7	13.3	12.7	12.3	11.6	11.5	11.2
Costa Rica	6.8	5.9	6.1	6.4	7.3	8.6	8.9	9.5
Cuba	7.2	7.6	7.2	7.0	7.0	7.1	7.0	7.0
Dominican Republic	10.1	9.0	8.4	7.9	7.4	6.5	6.2	5.6
Ecuador	27.7	27.8	26.4	24.4	23.0	23.2	23.1	22.7
El Salvador	28.7	23.5	17.5	15.5	13.1	11.0	10.7	10.0
Guatemala	53.2	52.2	48.7	47.1	46.0	44.9	44.2	43.5
Guyana	14.5	17.3	16.4	14.5	11.8	9.1	8.5	7.6
Haiti	30.3	28.0	25.2	23.8	22.2	20.7	20.3	19.5
Honduras	36.6	31.2	24.4	22.0	20.4	18.9	18.4	17.5
Jamaica	7.2	6.3	6.1	6.1	6.4	6.5	6.5	6.5
Mexico	20.3	16.9	14.3	13.3	12.8	12.8	12.8	12.6
Nicaragua	25.5	21.6	18.4	17.3	16.4	15.5	15.3	14.9
Panama	18.4	20.9	21.1	19.9	17.9	15.2	14.6	13.8
Paraguay	17.7	17.0	11.8	9.4	6.8	4.4	4.0	3.4
Peru	31.1	27.7	21.8	18.6	15.0	11.7	11.1	10.1
Saint Lucia	2.9	2.7	2.4	2.3	2.3	2.4	2.5	2.5
Suriname	13.6	11.0	9.0	8.3	8.2	8.0	7.9	7.6
Trinidad and Tobago	5.3	7.0	8.3	8.6	8.8	8.8	8.8	8.8
Uruguay	16.3	13.3	9.9	9.1	8.0	6.7	6.4	6.1
Venezuela (Bolivarian Republic of)	17.6	16.8	13.4	12.1	11.1	10.5	10.5	10.5

Source: 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

TABLE A-7
Prevalence of wasting among children under 5 years of age (percent)

	2000	2005	2010	2012	2015	2019	2020	2022
World	**8.7**	**8.3**	**7.7**	**7.5**	**7.2**	**6.9**	**6.8**	**6.8**
Latin America and the Caribbean								1.4
Caribbean								2.9
Mesoamerica								1.0
South America								1.4
Argentina		1.7						
Barbados				6.8				
Belize					1.8			
Bolivia (Plurinational State of)				1.5				
Brazil						3.4		
Colombia	1.0	1.6	0.9					
Cuba	2.4					2.0		
Dominican Republic	1.5					2.2		
Ecuador				2.4		3.7		
Guatemala	3.7				0.8			
Guyana	12.1					6.5		
Haiti	5.5			5.1				
Honduras				1.4		1.9		
Jamaica	3.0		4.8	3.0				
Mexico		4.9		1.6	1.0	1.4	1.6	1.0
Nicaragua				2.2				
Panama						1.1		
Paraguay		1.1		2.6				
Peru	1.1	1.0	0.7	0.6	0.6	0.4	0.4	0.5
Saint Lucia				3.7				
Suriname	7.0		5.0					
Trinidad and Tobago	5.2							
Venezuela (Bolivarian Republic of)	3.9	4.8						

Source: 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

TABLE A-8
Prevalence of overweight among children under 5 years of age (percent)

	2000	2005	2010	2012	2015	2019	2020	2022
World	**5.3**	**5.6**	**5.5**	**5.5**	**5.5**	**5.6**	**5.6**	**5.6**
Latin America and the Caribbean	6.8	7.1	7.3	7.4	7.7	8.1	8.3	8.6
Caribbean	6.1	6.4	6.4	6.5	6.5	6.6	6.6	6.6
Mesoamerica	6.9	6.7	6.6	6.6	6.5	6.5	6.5	6.7
South America	6.9	7.4	7.7	7.9	8.3	9.0	9.3	9.7
Argentina	10.7	10.8	10.9	11.0	11.2	11.8	12.0	12.6
Barbados	8.9	10.2	11.4	11.8	12.4	12.7	12.7	12.5
Belize	11.9	11.1	9.4	8.7	7.7	6.6	6.3	5.9
Bolivia (Plurinational State of)	9.0	9.2	9.1	8.9	8.7	8.8	8.8	9.0
Brazil	6.2	7.0	7.6	7.9	8.5	9.4	9.7	10.3
Chile	11.5	11.2	10.2	9.8	9.4	9.0	8.9	8.8
Colombia	4.7	4.8	5.0	5.0	5.2	5.7	5.8	6.2
Costa Rica	7.9	7.8	7.6	7.6	7.5	7.5	7.6	7.6
Cuba	8.9	9.2	9.6	9.7	9.9	10.1	10.1	10.2
Dominican Republic	7.1	7.7	7.5	7.5	7.5	7.5	7.5	7.6
Ecuador	3.8	4.9	6.6	7.5	9.0	10.6	11.0	11.9
El Salvador	4.6	5.3	6.0	6.2	6.5	6.7	6.7	6.8
Guatemala	6.2	5.7	5.2	5.1	4.8	4.7	4.7	4.8
Guyana	4.7	5.7	6.1	6.2	6.3	6.1	6.0	5.7
Haiti	3.7	3.6	3.4	3.4	3.5	3.6	3.6	3.7
Honduras	3.5	4.2	4.8	5.0	5.0	4.9	4.9	4.7
Jamaica	6.3	7.0	7.0	6.9	6.6	6.1	6.0	5.7
Mexico	7.4	7.1	6.9	6.8	6.7	6.7	6.7	6.9
Nicaragua	6.4	6.8	7.1	7.3	7.6	8.2	8.4	8.7
Panama	8.6	9.6	10.2	10.5	10.9	11.3	11.4	11.4
Paraguay	6.8	7.9	9.6	10.4	11.7	13.4	13.8	14.6
Peru	10.0	9.3	8.2	8.1	8.0	8.5	8.7	9.4
Saint Lucia	6.4	6.1	6.0	6.0	6.1	6.0	6.0	6.0
Suriname	3.4	3.5	3.7	3.7	3.7	3.8	3.8	3.8
Trinidad and Tobago	5.6	7.3	9.5	10.5	12.0	13.5	13.7	13.9
Uruguay	9.5	9.3	9.2	9.3	9.6	10.5	10.8	11.5
Venezuela (Bolivarian Republic of)	5.3	5.8	6.0	6.2	6.5	6.8	6.9	6.9
Saint Lucia	19.0	17.0	14.9	14.1	13.7	13.9	14.1	14.3
Saint Vincent and the Grenadines	24.6	20.7	18.0	17.3	16.9	16.7	16.8	17.0
Suriname	27.6	24.5	21.1	20.3	20.2	20.5	20.7	21.0
Trinidad and Tobago	25.5	21.8	18.8	17.8	17.4	17.4	17.5	17.7
Uruguay	13.4	14.2	13.3	13.2	13.8	14.4	14.7	15.0
Venezuela (Bolivarian Republic of)	27.4	25.0	21.3	20.9	21.9	23.0	23.7	24.2

Source: 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

TABLE A-9
Prevalence of anaemia among women aged 15 to 49 years (percent)

	2000	2005	2010	2012	2015	2017	2018	2019
World	**31.2**	**29.9**	**28.6**	**28.5**	**28.8**	**29.3**	**29.6**	**29.9**
Latin America and the Caribbean	25.6	22.8	19.3	18.2	17.3	17.1	17.1	17.2
Caribbean	34.8	32.0	29.2	28.7	28.6	28.8	29.0	29.2
Mesoamerica	22.5	19.0	16.1	15.2	14.5	14.3	14.4	14.6
South America	25.9	23.4	19.6	18.4	17.4	17.2	17.2	17.3
Antigua and Barbuda	22.0	19.6	17.1	16.7	16.6	16.9	17.0	17.2
Argentina	16.2	15.5	13.4	12.7	12.1	11.9	11.8	11.9
Bahamas	17.4	15.5	13.9	13.3	13.4	13.7	14.1	14.5
Barbados	20.6	19.1	17.3	16.9	16.7	16.7	16.8	17.0
Belize	27.2	24.5	21.9	21.2	20.6	20.5	20.5	20.5
Bolivia (Plurinational State of)	33.1	32.6	30.0	28.6	26.7	25.1	24.6	24.4
Brazil	26.9	24.2	19.9	18.3	16.8	16.3	16.2	16.1
Chile	9.2	8.3	7.9	7.9	8.0	8.3	8.5	8.7
Colombia	30.3	27.5	23.3	22.1	21.1	20.9	21.0	21.2
Costa Rica	16.1	14.1	12.4	12.3	12.6	13.0	13.3	13.7
Cuba	28.5	25.1	21.0	20.2	19.5	19.3	19.2	19.3
Dominica	25.8	22.0	20.6	20.1	19.9	20.1	20.4	20.8
Dominican Republic	36.8	33.0	28.9	28.0	27.3	26.6	26.5	26.4
Ecuador	25.1	21.4	18.3	17.3	17.0	17.0	17.1	17.2
El Salvador	11.4	10.5	10.0	9.9	9.9	10.1	10.4	10.6
Grenada	24.6	21.6	19.6	18.9	18.7	18.8	19.0	19.2
Guatemala	22.4	17.7	12.9	11.0	8.9	7.9	7.6	7.4
Guyana	44.1	40.3	35.9	34.4	32.7	32.0	31.8	31.7
Haiti	53.8	50.8	48.2	47.6	47.4	47.5	47.6	47.7
Honduras	21.5	18.4	16.8	16.6	16.9	17.3	17.6	18.0
Jamaica	24.8	22.0	20.0	19.5	19.4	19.5	19.6	19.9
Mexico	23.5	19.8	16.8	15.9	15.1	15.0	15.1	15.3
Nicaragua	19.5	15.2	13.5	13.3	13.9	14.6	15.1	15.7
Panama	28.5	26.2	23.0	22.1	21.3	21.1	21.2	21.2
Paraguay	24.1	23.8	22.2	22.2	22.4	23.0	23.0	23.0
Peru	32.4	27.4	22.0	20.6	20.1	20.2	20.4	20.6
Saint Kitts and Nevis	20.6	18.6	17.0	16.0	14.9	14.8	15.1	15.4
Saint Lucia	19.0	17.0	14.9	14.1	13.7	13.9	14.1	14.3
Saint Vincent and the Grenadines	24.6	20.7	18.0	17.3	16.9	16.7	16.8	17.0
Suriname	27.6	24.5	21.1	20.3	20.2	20.5	20.7	21.0
Trinidad and Tobago	25.5	21.8	18.8	17.8	17.4	17.4	17.5	17.7
Uruguay	13.4	14.2	13.3	13.2	13.8	14.4	14.7	15.0
Venezuela (Bolivarian Republic of)	27.4	25.0	21.3	20.9	21.9	23.0	23.7	24.2

Note: The estimates refer to women aged 15 to 49 years, including pregnant, non-pregnant women and lactating women and were adjusted for altitude and smoking. The World Health Organization (WHO) defines anaemia in pregnant women as a haemoglobin concentration <110 g/L at sea level, and anaemia in non-pregnant women and lactating women as a haemoglobin concentration <120 g/L.
Source: WHO. 2021. WHO global anaemia estimates, 2021 edition. In: WHO. [Cited 24 July 2024]. www.who.int/data/gho/data/themes/topics/anaemia_in_women_and_children

TABLE A-10

Prevalence of obesity among adults (percent)

	2000	2005	2010	2012	2015	2019	2020	2022
World	**8.7**	**10.1**	**11.5**	**12.1**	**13.1**	**14.5**	**14.9**	**15.8**
Latin America and the Caribbean	15.4	18.1	21.1	22.4	24.5	27.5	28.3	29.9
Caribbean	13.4	16.1	18.6	19.5	20.9	22.9	23.4	24.5
Mesoamerica	20.2	23.4	26.5	27.9	29.9	32.4	33.1	34.4
South America	14.1	16.5	19.4	20.7	22.9	26.0	26.9	28.6
Antigua and Barbuda	18.8	22.3	25.5	26.8	28.7	31.2	31.9	33.3
Argentina	18.3	21.3	24.7	26.3	28.8	32.4	33.4	35.4
Bahamas	28.7	33.7	38.1	39.8	42.1	45.1	45.8	47.3
Barbados	22.1	25.8	29.4	30.9	33.0	35.8	36.6	38.0
Belize	25.6	29.8	33.7	35.2	37.3	40.1	40.8	42.3
Bolivia (Plurinational State of)	13.0	15.8	19.1	20.5	22.8	26.0	26.9	28.7
Brazil	12.3	14.7	17.6	19.1	21.6	25.2	26.2	28.1
Chile	20.6	24.2	28.0	29.6	32.2	36.0	37.0	38.9
Colombia	11.8	14.3	17.0	18.2	19.9	22.0	22.5	23.6
Costa Rica	17.3	20.4	23.6	24.9	26.8	29.4	30.0	31.4
Cuba	10.7	12.9	15.3	16.3	17.8	20.0	20.6	21.8
Dominica	17.3	20.3	23.3	24.5	26.5	29.2	29.9	31.3
Dominican Republic	14.2	17.6	21.0	22.3	24.3	27.1	27.8	29.3
Ecuador	13.6	16.0	18.8	20.1	22.1	25.0	25.8	27.4
El Salvador	18.1	21.1	24.1	25.3	27.0	29.2	29.8	30.9
Grenada	16.7	19.8	22.7	23.9	25.7	28.3	28.9	30.3
Guatemala	12.6	15.6	18.7	20.0	22.0	24.7	25.4	26.8
Guyana	14.2	17.1	20.1	21.4	23.4	26.2	27.0	28.5
Haiti	5.5	6.7	7.9	8.3	8.9	9.9	10.1	10.7
Honduras	14.6	17.9	21.3	22.7	24.7	27.4	28.1	29.5
Jamaica	17.0	21.0	24.9	26.4	28.5	31.5	32.3	33.8
Mexico	21.6	24.8	28.0	29.3	31.4	34.0	34.7	36.0
Nicaragua	19.7	23.0	26.2	27.5	29.4	31.8	32.4	33.6
Panama	17.2	20.9	24.9	26.7	29.5	33.2	34.1	36.1
Paraguay	17.3	20.2	23.4	24.8	27.1	30.4	31.2	33.0
Peru	12.1	14.2	17.0	18.5	20.8	24.4	25.3	27.3
Saint Kitts and Nevis	28.6	33.3	37.3	38.7	40.8	43.6	44.3	45.6
Saint Lucia	17.2	21.0	24.6	26.1	28.2	31.1	31.9	33.5
Saint Vincent and the Grenadines	18.7	22.1	25.3	26.6	28.5	31.1	31.8	33.2
Suriname	15.7	18.7	21.6	22.8	24.6	27.0	27.7	29.0
Trinidad and Tobago	20.0	22.3	24.1	24.7	25.6	26.9	27.3	28.1
Uruguay	17.6	20.4	23.6	25.0	27.3	30.7	31.5	33.3
Venezuela (Bolivarian Republic of)	19.0	21.1	22.4	22.7	22.9	22.8	22.8	22.7

Source: WHO. 2024. Global Health Observatory (GHO) data repository: Prevalence of obesity among adults, BMI ≥ 30, age-standardized. Estimates by country. [Accessed on 24 July 2024]. https://apps.who.int/gho/data/node.main.A900A?lang=en. License: CC-BY-4.0.

TABLE A-11
Prevalence of exclusive breastfeeding among infants 0–5 months of age (percent)

	2000	2005	2012	2015	2020	2021	2022
World			**37.1**				**48.0**
Latin America and the Caribbean			34.3				43.1
Caribbean			29.5				31.4
Mesoamerica			21.6				38.7
South America			42.2				47.1
Barbados			19.7				
Belize				33.2			
Bolivia (Plurinational State of)	38.6		64.3				
Colombia	25.1	46.8					
Cuba	41.2						
Dominican Republic	11.0						
El Salvador						45.3	
Guatemala				53.2		58.5	
Guyana	10.4						
Haiti	23.0		39.3				
Honduras			30.7				
Jamaica		15.2					
Mexico			14.4	30.1		35.9	
Nicaragua			31.7				
Peru	66.6	63.3	67.4	62.7	69.2	64.6	66.9
Saint Lucia			3.5				
Suriname	4.7						
Trinidad and Tobago	2.3						

Source: UNICEF. 2024. Infant and young child feeding. In: UNICEF. [Cited 24 July 2024]. https://data.unicef.org/topic/nutrition/infant-and-young-child-feeding

TABLE A-12
Prevalence of low birthweight (percent)

	2000	2005	2010	2012	2015	2019	2020
World	**16.6**	**16.1**	**15.3**	**15.0**	**14.8**	**14.6**	**14.7**
Latin America and the Caribbean	9.3	9.4	9.5	9.5	9.5	9.6	9.6
Caribbean	10.8	11.1	11.3	11.4	11.5	11.7	11.7
Mesoamerica	10.6	10.7	10.8	10.9	10.9	10.9	10.9
South America	8.5	8.6	8.6	8.6	8.7	8.8	8.8
Antigua and Barbuda	14.1	14.5	14.9	15.1	15.2	15.4	15.4
Argentina	7.3	7.4	7.2	7.2	7.3	7.4	7.4
Bahamas	14.6	14.8	15.2	15.3	15.4	15.4	15.4
Belize	10.9	10.9	11.2	11.3	11.4	11.5	11.6
Bolivia (Plurinational State of)	8.9	8.7	8.4	8.3	8.1	8.0	7.9
Brazil	8.0	8.2	8.3	8.3	8.5	8.7	8.7
Chile	5.3	5.6	6.0	6.1	6.4	6.8	6.8
Colombia	9.7	10.0	10.4	10.5	10.6	10.9	11.0
Costa Rica	8.3	8.4	8.5	8.5	8.6	8.7	8.7
Cuba	7.1	7.1	7.2	7.2	7.2	7.1	7.1
Dominican Republic	10.2	11.0	11.8	12.1	12.6	13.2	13.4
Ecuador	11.5	11.3	11.1	10.9	10.8	10.7	10.6
El Salvador	10.4	10.5	10.4	10.4	10.3	10.2	10.2
Guatemala	13.9	14.1	14.3	14.4	14.5	14.5	14.5
Guyana	16.3	16.6	16.9	17.0	17.1	17.2	17.2
Honduras	11.5	11.8	12.3	12.5	12.8	13.0	13.1
Jamaica	14.9	14.7	14.5	14.3	14.1	13.8	13.7
Mexico	10.0	10.1	10.2	10.2	10.2	10.2	10.2
Nicaragua	11.4	11.2	10.9	10.7	10.5	10.2	10.1
Panama	11.5	11.4	10.9	10.7	10.5	10.3	10.3
Paraguay	9.8	10.1	10.0	10.0	10.0	10.0	10.0
Peru	10.2	9.5	8.6	8.3	8.0	7.6	7.5
Saint Lucia	14.4	15.0	15.7	15.9	16.1	16.2	16.3
Suriname	14.2	14.8	15.4	15.7	16.0	16.4	16.5
Trinidad and Tobago	15.1	15.4	15.7	15.9	16.2	16.3	16.3
Uruguay	8.4	8.4	8.1	8.0	7.9	7.8	7.8
Venezuela (Bolivarian Republic of)	8.7	8.9	8.9	9.0	9.1	9.3	9.3

Sources: UNICEF & WHO. 2023. Low birthweight. In: UNICEF. [Cited 24 July 2024]. https://data.unicef.org/topic/nutrition/low-birthweight; UNICEF & WHO. 2023. Joint low birthweight estimates. In: WHO. [Cited 24 July 2024]. www.who.int/teams/nutrition-and-food-safety/monitoring-nutritional-status-and-food-safety-and-events/joint-low-birthweight-estimates

TABLE A-13
Affordability of a healthy diet

	Proportion of the population unable to afford a healthy diet (percent)						Number of people unable to afford a healthy diet (millions)					
	2017	2018	2019	2020	2021	2022	2017	2018	2019	2020	2021	2022
World	**40.3**	**38.0**	**36.4**	**37.9**	**36.4**	**35.4**	**3 062.3**	**2 916.1**	**2 823.4**	**2 968.0**	**2 876.4**	**2 826.3**
Latin America and the Caribbean	29.2	28.4	27.8	28.9	30.1	27.7	185.5	181.8	180.0	188.1	197.2	182.9
Caribbean	47.2	45.9	46.1	49.5	50.1	50.0	20.4	19.9	20.1	21.8	22.1	22.2
Mesoamerica	30.7	29.8	27.9	31.9	27.7	26.3	52.6	51.5	48.9	56.3	49.1	47.1
South America	26.7	26.0	25.9	25.5	29.0	26.0	112.5	110.3	111.0	110.1	126.0	113.6
Antigua and Barbuda	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Argentina	8.6	n.r.	n.r.	n.r.	n.r.	n.r.	3.8	n.r.	n.r.	n.r.	n.r.	n.r.
Aruba	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Bahamas	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Barbados	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Belize	65.6	65.5	62.8	69.9	65.6	61.8	0.2	0.3	0.2	0.3	0.3	0.3
Bolivia (Plurinational State of)	14.3	13.0	9.6	10.8	8.9	8.5	1.6	1.5	1.1	1.3	1.1	1.0
Brazil	27.4	26.6	26.3	19.8	30.2	25.3	57.2	56.0	55.7	42.1	64.7	54.4
British Virgin Islands	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Cayman Islands	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Chile	48.1	46.1	46.0	50.3	42.5	40.4	8.8	8.6	8.8	9.7	8.3	7.9
Colombia	31.7	31.6	32.7	41.2	37.9	36.6	15.3	15.6	16.4	21.0	19.5	19.0
Costa Rica	14.3	15.1	15.2	20.9	15.1	15.9	0.7	0.8	0.8	1.1	0.8	0.8
Cuba	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Curaçao	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Dominica	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Dominican Republic	26.9	23.4	21.8	25.7	26.1	24.8	2.9	2.5	2.4	2.8	2.9	2.8
Ecuador	23.1	23.9	24.8	30.4	27.2	25.9	3.9	4.1	4.3	5.3	4.8	4.7
El Salvador	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Grenada	19.6	19.1	18.8	23.2	22.2	21.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Guatemala	46.7	46.5	45.6	48.0	44.9	43.9	7.7	7.8	7.8	8.3	7.9	7.8
Guyana	41.3	41.0	39.2	22.6	16.9	9.4	0.3	0.3	0.3	0.2	0.1	0.1
Haiti	77.4	77.9	79.4	81.5	82.4	83.6	8.4	8.6	8.9	9.2	9.4	9.7
Honduras	39.8	39.0	38.7	43.4	38.9	39.0	3.8	3.8	3.9	4.4	4.0	4.1
Jamaica	19.2	17.1	18.2	23.6	23.1	22.1	0.5	0.5	0.5	0.7	0.7	0.6
Mexico	28.3	27.1	24.6	28.6	24.2	22.5	34.8	33.6	30.8	36.0	30.7	28.7
Nicaragua	25.0	26.9	29.2	30.6	26.8	27.3	1.6	1.8	1.9	2.1	1.8	1.9
Panama	42.3	40.1	39.4	49.9	45.1	43.5	1.7	1.7	1.7	2.1	2.0	1.9
Paraguay	24.0	22.3	22.0	24.7	24.6	24.1	1.5	1.4	1.4	1.6	1.6	1.6
Peru	33.5	30.4	28.9	42.9	33.9	33.6	10.6	9.8	9.5	14.3	11.4	11.5
Saint Kitts and Nevis	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Saint Lucia	8.5	8.5	8.6	12.4	9.7	8.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Saint Vincent and the Grenadines	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Sint Maarten (Dutch part)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Suriname	19.6	18.6	18.9	24.8	25.9	25.5	0.1	0.1	0.1	0.2	0.2	0.2
Trinidad and Tobago	32.0	33.0	33.3	38.1	39.2	39.1	0.5	0.5	0.5	0.6	0.6	0.6
Turks and Caicos Islands	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Uruguay	31.1	32.6	33.3	38.2	37.8	36.1	1.1	1.1	1.1	1.3	1.3	1.2
Venezuela (Bolivarian Republic of)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Source: FAO. 2023. FAOSTAT: Cost and Affordability of a Healthy Diet (CoAHD). In: FAO. Rome. [Cited July 2023]. https://www.fao.org/faostat/en/#data/CAHD

TABLE A-14
Cost of a healthy diet (PPP dollars per person per day)

	2017	2018	2019	2020	2021	2022
World	**3.13**	**3.17**	**3.25**	**3.35**	**3.56**	**3.96**
Latin America and the Caribbean	3.61	3.68	3.76	3.87	4.08	4.56
Caribbean	4.03	4.16	4.27	4.41	4.63	5.16
Mesoamerica	3.24	3.30	3.37	3.42	3.60	4.05
South America	3.42	3.44	3.52	3.61	3.84	4.29
Antigua and Barbuda	3.93	4.11	4.20	4.31	4.48	4.97
Argentina	3.32	n.r.	n.r.	n.r.	n.r.	n.r.
Aruba	3.47	3.68	3.97	4.09	4.20	4.71
Bahamas	4.28	4.39	4.36	4.49	4.66	5.41
Barbados	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Belize	2.51	2.55	2.60	2.66	2.83	3.10
Bolivia (Plurinational State of)	3.50	3.60	3.72	3.70	3.87	4.20
Brazil	3.22	3.21	3.30	3.53	3.84	4.25
British Virgin Islands	3.53	3.37	3.59	3.52	3.74	3.80
Cayman Islands	3.58	3.52	3.32	3.56	3.72	3.83
Chile	3.38	3.52	3.66	3.79	3.86	4.54
Colombia	2.84	2.87	2.95	3.15	3.34	4.13
Costa Rica	3.54	3.57	3.67	3.55	3.67	4.27
Cuba	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Curaçao	3.02	3.15	3.31	3.41	3.68	4.10
Dominica	4.30	4.46	4.56	4.67	4.91	5.32
Dominican Republic	3.33	3.41	3.54	3.67	3.91	4.31
Ecuador	2.50	2.52	2.56	2.62	2.72	2.99
El Salvador	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Grenada	4.52	4.65	4.72	4.87	5.12	5.70
Guatemala	2.43	2.58	2.73	2.85	3.00	3.31
Guyana	4.63	4.74	4.83	4.89	5.12	5.53
Haiti	3.93	4.07	4.28	4.49	4.81	5.26
Honduras	3.63	3.69	3.68	3.77	3.89	4.37
Jamaica	4.94	5.08	5.29	5.52	5.82	6.42
Mexico	2.90	2.97	2.98	3.07	3.29	3.89
Nicaragua	3.67	3.73	3.77	3.84	4.07	4.61
Panama	3.99	4.03	4.13	4.22	4.42	4.82
Paraguay	3.68	3.77	3.78	3.81	4.15	4.70
Peru	3.28	3.26	3.30	3.33	3.55	4.00
Saint Kitts and Nevis	3.35	3.55	3.70	3.80	3.94	4.58
Saint Lucia	3.44	3.59	3.71	3.79	3.87	4.15
Saint Vincent and the Grenadines	4.34	4.45	4.51	4.68	4.94	5.56
Sint Maarten (Dutch part)	4.46	4.79	4.81	4.90	5.23	5.50
Suriname	4.42	4.65	4.75	5.11	5.42	5.82
Trinidad and Tobago	3.91	4.01	4.07	4.21	4.51	5.08
Turks and Caicos Islands	2.81	2.90	2.97	3.07	3.23	3.55
Uruguay	2.87	2.96	3.04	3.19	3.31	3.64
Venezuela (Bolivarian Republic of)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Source: 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.

ANNEX II
INDICATORS DEFINITIONS

Undernourishment

Undernourishment is defined as the condition of an individual whose habitual food consumption is insufficient to provide, on average, the amount of dietary energy required to maintain a normal, active and healthy life. The indicator is reported as a prevalence and is denominated as "prevalence of undernourishment", which is an estimate of the percentage of individuals in the total population who are in a condition of undernourishment.

Data source: 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.

Food insecurity as measured by the Food Insecurity Experience Scale

Food insecurity as measured by the Food Insecurity Experience Scale (FIES) indicator refers to limited access to food, at the level of individuals or households, due to a lack of money or other resources. The severity of food insecurity is measured using data collected with the FIES survey module (FIES-SM), a set of eight questions asking respondents to self-report conditions and experiences typically associated with limited access to food. For purposes of annual SDG monitoring, the questions are asked with reference to the 12 months preceding the survey.

FAO provides estimates of food insecurity at two different levels of severity: moderate or severe food insecurity and severe food insecurity. People affected by moderate food insecurity face uncertainties about their ability to obtain food and have been forced to reduce, at times during the year, the quality and/or quantity of food they consume due to lack of money or other resources. Severe food insecurity refers to situations when individuals have likely run out of food, experienced hunger and, at the most extreme, gone for days without eating. The prevalence of moderate or severe food insecurity is the combined prevalence of food insecurity at both severity levels.

Data source: 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.

Stunting, wasting and overweight in children under 5 years of age

Stunting (children under 5 years of age): height/length (cm) for age (months) < -2 SD of the WHO Child Growth Standards median. Low height-for-age is an indicator that reflects the cumulative effects of undernutrition and infections since and even before birth. It may be the result of long-term nutritional deprivation, recurrent infections and lack of water and sanitation infrastructures. Stunted children are at greater risk for illness and death. Stunting often adversely affects the cognitive and physical growth of children, making for poor performance in school and reduced intellectual capacity.

Prevalence cut-off values for public health significance are as follows: very low < 2.5 percent; low 2.5–9.9 percent; medium 10–19.9 percent; high 20–29.9 percent; very high ≥ 30 percent.

Wasting: weight (kg) for height/length (cm) < -2 SD of the WHO Child Growth Standards median. Low weight-for-height is an indicator of acute weight loss or a failure to gain weight and can be the result of insufficient food intake and/or an incidence of infectious diseases, especially diarrhoea. Wasting indicates acute malnutrition and increases the risk of death in childhood from infectious diseases such as diarrhoea, pneumonia and measles.

Prevalence cut-off values for public health significance for wasting are as follows: very low < 2.5 percent; low 2.5–4.9 percent; medium 5–9.9 percent; high 10–14.9 percent; very high ≥ 15 percent.

Overweight: weight (kg) for height/ length (cm) > +2 SD of the WHO Child Growth Standards median. This indicator reflects excessive weight gain for height generally due to energy intakes exceeding children's energy requirements. Childhood overweight and obesity is associated with a higher probability of overweight and obesity in adulthood, which can lead to various non-communicable diseases such as diabetes and cardiovascular diseases.

Prevalence cut-off values for public health significance for child overweight are as follows: very low < 2.5 percent; low 2.5–4.9 percent; medium 5–9.9 percent; high 10–14.9 percent; very high ≥ 15 percent.

Data source: 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

Anaemia in women aged 15 to 49 years

Definition: percentage of women aged 15 to 49 years with a haemoglobin concentration less than 120 g/L for non-pregnant women and lactating women, and less than 110 g/L for pregnant women, adjusted for altitude and smoking.

Prevalence cut-off values for public health significance are as follows: no public health problem < 5 percent; mild 5–19.9 percent; moderate 20–39.9 percent; severe ≥ 40 percent.

Data source: WHO. 2021. Vitamin and Mineral Nutrition Information System (VMNIS). In: WHO. [Cited 25 May 2021]. https://www.who.int/teams/nutrition-and-food-safety/databases/vitamin-and-mineral-nutrition-information-system; WHO. 2021. WHO global anaemia estimates, 2021 edition. In: WHO. [Cited 24 July 2024]. www.who.int/data/gho/data/themes/topics/anaemia_in_women_and_children

Adult obesity

The body mass index (BMI) is the ratio of weight-to-height commonly used to classify the nutritional status of adults. It is calculated as the body weight in kilograms divided by the square of the body height in metres (kg/m2). Obesity includes individuals with BMI equal to or higher than 30 kg/m2.

Data source: WHO. 2024. Global Health Observatory (GHO) data repository: Prevalence of obesity among adults, BMI ≥ 30, age-standardized. Estimates by country. [Accessed on 24 July 2024]. https://apps.who.int/gho/data/node.main.A900A?lang=en. License: CC-BY-4.0.

Exclusive breastfeeding

Exclusive breastfeeding for infants under 6 months of age is defined as receiving only breastmilk and no additional food or drink, not even water. Exclusive breastfeeding is a cornerstone of child survival and is the best food for newborns, as breastmilk shapes the baby’s microbiome, strengthens the immune system and reduces the risk of developing chronic diseases. Breastfeeding also benefits mothers by preventing postpartum haemorrhage and promoting uterine involution, decreasing risk of iron-deficiency anaemia, reducing the risk of various types of cancer and providing psychological benefits.

Data source: UNICEF. 2024. Infant and young child feeding. In: UNICEF. [Cited 24 July 2024]. https://www.fao.org/faostat/en/#data/FS

Low birthweight

Low birthweight is defined as a weight at birth of less than 2.5 kg (less than 5.51 lbs), regardless of gestational age. A newborn's weight at birth is an important marker of maternal and foetal health and nutrition.

Data source: UNICEF & WHO. 2023. Low birthweight. In: UNICEF. [Cited 24 July 2024]. https://data.unicef.org/topic/nutrition/low-birthweight; UNICEF & WHO. 2023. Joint low birthweight estimates. In: WHO. [Cited 24 July 2024]. www.who.int/teams/nutrition-and-food-safety/monitoring-nutritional-status-and-food-safety-and-events/joint-low-birthweight-estimates

Cost and affordability of a healthy diet

The cost of a healthy diet (CoHD) is the cost of purchasing the least expensive locally available foods to meet the energy requirements and food-based dietary guidelines for a representative person within energy balance at 2 330 kcal/day. The CoHD is calculated using retail food price data from the 2024 series of the International Comparison Program (ICP), coordinated by the World Bank, which refer to 2021 prices. The cost of a healthy diet is converted to international dollars using purchasing power parity (PPP) conversion factors for private consumption.

The prevalence of unaffordability (PUA) estimates the percentage of individuals in a population whose disposable income, net of the amount needed to acquire all basic non-food goods and services, is lower than the minimum cost of a healthy diet. National estimates are obtained by contrasting the country-specific income distributions against a threshold (r). The threshold r is obtained by summing the cost of a healthy diet in a country and the basic cost of non-food needs for the income group to which the country belongs. Specifically, the cost of non-food needs is calculated by multiplying World Bank international poverty lines by a share of total expenditure to be reserved for non-food basic goods and services that is specific to each income group. Along with the PUA, the number of people unable to afford a healthy diet (NUA) is computed by multiplying the PUA by the reference population size.

Data source: FAO. 2024. FAOSTAT: Cost and Affordability of a Healthy Diet (CoAHD). [Accessed on 24 July 2024]. https://www.fao.org/faostat/en/#data/FS. Licence: CC-BY-4.0.

ANNEX III
NOTES

For specific country notes, please refer to Tables A.1.1 and A.1.2 in: FAO, IFAD, UNICEF, WFP & WHO. 2024. The State of Food Security and Nutrition in the World 2024 – Financing to end hunger, food insecurity and malnutrition in all its forms. Rome. https://doi.org/10.4060/cd1254en

Prevalence of undernourishment

Subregional and regional estimates were included when more than 50 percent of the population was covered. National estimates are reported as three-year moving averages to control for the low reliability of some of the underlying parameters such as the year-to-year variation in food commodity stocks, one of the components of the annual FAO Food Balance Sheets, for which complete and reliable information is scarce. Subregional, regional and global aggregates are reported as annual estimates since possible estimation errors are not expected to be correlated across countries.

Food insecurity

Subregional and regional estimates were included when more than 50 percent of the population was covered. To reduce the margin of error, national estimates are presented as three-year averages.

FAO estimates refer to the number of people living in households where at least one adult has been found to be food insecure.

Country-level results are presented only for those countries for which estimates are based on official national data or as provisional estimates, based on FAO data collected through the Gallup© World Poll, for countries whose national relevant authorities expressed no objection to their publication. Note that consent to publication does not necessarily imply validation of the estimate by the national authorities involved and that the estimate is subject to revision as soon as suitable data from official national sources is available. Global aggregates are based on data collected in approximately 150 countries.

Child stunting, wasting and overweight

For child wasting regional estimates, values correspond to the model predicted estimates for 2022 only. Wasting is an acute condition that can change often and rapidly over the course of a calendar year. This makes it difficult to generate reliable trends over time with the input data available – as such, this report provides only the most recent global and regional estimates.

Exclusive breastfeeding

Regional estimates are included when more than 50 percent of the population is covered.

ANNEX IV
COUNTRY GROUPINGS

FAO uses the M49 country and regional groupings, available at https://unstats.un.org/unsd/methodology/m49.

In this report, Mesoamerica refers to the M49 Central America grouping.

The groupings are:

- **Caribbean:** Antigua and Barbuda, the Bahamas, Barbados, Cuba, Dominica, the Dominican Republic, Grenada, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, and Trinidad and Tobago

- **Mesoamerica:** Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama

- **South America:** Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay and Venezuela (Bolivarian Republic of)

ANNEX V
GLOSSARY

Adaptation

The process of adjustment to actual or projected climate and its effects. In human systems, adaptation seeks to moderate harms or take advantage of opportunities. In some natural systems, human intervention can facilitate adjustment to the projected climate and its effects.[491]

Adaptive capacity

The ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities or to respond to consequences.[492] The ability of a system to adapt to climate change (particularly climate variability and extremes), in order to moderate potential damage, take advantage of emerging opportunities, or address the consequences.[493] The ability to adapt to new options in crisis situations through active and informed decision making about alternative livelihood strategies based on an understanding of changing conditions.[494]

Adaptation to climate change

An approach to adaptation (see definition of this concept above) to address current or anticipated situations of climate variability and changes in average climatic conditions.[495]

Agrifood systems

A term increasingly used in the context of transforming food systems for sustainability and inclusivity, agrifood systems encompass both agricultural and food systems and focus on both food and non-food agricultural products, with clear overlaps. Agrifood systems encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products. They comprise all food products that originate from crop and livestock production, forestry, fisheries and aquaculture, as well as the broader economic, societal and natural environments in which these diverse production systems are embedded.[496]

Climate

Climate is usually defined in a narrow sense as the average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years.[497]

Climate change

A change in the state of the climate that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer.[498]

Climate extremes (extreme weather or climate events)

The occurrence of a value of a weather or climate variable above (or below) a threshold value near the upper (or lower) ends of the range of observed values of the variable.[499] Many weather and climate extremes are the result of natural climate variability; natural decadal or multi-decadal variations in climate constitute the backdrop for anthropogenic climate change. Even if there were no anthropogenic changes in the climate, a wide variety of extreme weather and climate events would still exist.[500] Included within this terminology are drought, flooding, heat waves and storms. It should be noted that due to limitations in available data, it is not possible to count the total number of extreme weather events in a given year.[501] For the sake of simplicity, both extreme weather events and extreme climate events are collectively referred to as "extreme climate events" or "climate extremes".[502]

Climate shocks

These not only include alterations in the usual rainfall and temperature regime, but also include complex phenomena such as drought and flooding. Equivalent to the concept of natural hazard or stress, these are exogenous phenomena that can have a negative effect on food or nutritional security, depending on the vulnerability of an individual, a household, a community or systems to the shock.[503,504,505,506]

Climate resilience

Approach to fostering or strengthening resilience (see definition of Resilience below) to address current or anticipated climate variability and changes in average climate conditions.[507]

Climate variability

Refers to variations in the mean state and other statistical characteristics (for example, standard deviations or the frequency of extreme conditions) of the climate at all spatial and temporal scales beyond particular weather events.[508] Variability may be due to natural internal processes of the climate system (internal variability) or to variations in natural or anthropogenic external forcing (external variability).[509]

Diet quality (or healthy diets)

Comprising four key aspects: diversity (within and across food groups), adequacy (sufficiency of all essential nutrients compared to requirements), moderation (foods and nutrients that are related to poor health outcomes) and balance (energy and macronutrient intake). Foods consumed should be safe. [510]

Drought

A period of abnormally dry weather lasting long enough to cause a serious hydrological imbalance.[511]

Exposure

Exposure is defined as the presence of people, livelihoods, species or ecosystems, environmental services and resources, infrastructure, or economic, social or cultural assets in places that could be negatively affected by extreme climate events.[512]

Food security

A situation that occurs when all people, at all times, have physical, social and economic access to sufficient safe and nutritious foods to meet their dietary needs and food preferences for an active and healthy life. According to this definition, four dimensions of food security can be determined: availability of food, physical and economic access to food, utilization of food and stability over time. The concept of food security is evolving towards the recognition of the essential importance of choice and sustainability. See the definitions of each of these two additional elements in the definition of Food security dimensions.

Food security dimensions

In this report, the dimensions of food security refer to the four traditional dimensions on the subject:

a. Availability: this dimension establishes whether food is actually or potentially present in physical form or not, and also addresses aspects of production, food reserves, markets and transportation, as well as wild foods.

b. Access: if food is actually or potentially present in physical form, the next question is whether households and individuals have sufficient physical and economic access to it.

c. Utilization: if food is available and households have adequate access to it, the next question is whether households are consuming adequate nutrients and dietary energy. Sufficient energy and nutrient intake are the result of good care and feeding practices, food processing, dietary diversity and adequate distribution of food, clean water, sanitation, and health care within the household. In combination with adequate biological utilization of the food consumed, this determines the nutritional status of people.

d. Stability: if the needs of availability, access and utilization are met to the appropriate extent, stability is the condition that determines whether the entire system is stable, thus guaranteeing the food security of households at all times. Stability issues can refer to short-term instability (which can lead to acute food insecurity) or medium- or long-term instability (which can lead to chronic food insecurity). Climatic, economic, social and political factors can be a source of instability.

The report also refers to two other dimensions of food security proposed by the High Level Panel of Experts on Food Security and Nutrition (HLPE) of the Committee on World Food Security (CFS). However, neither FAO nor other bodies have formally accepted these proposals, and no consensus terminology has been negotiated in this regard. Despite this, in view of their relevance in the context of this report, both dimensions are included. These two additional dimensions of food security are reinforced through legal conceptualizations and interpretations of the right to food, and are mentioned based on the following definitions:

e. Agency: refers to the capacity of people or groups to make their own decisions about the food they eat, what foods they produce, how that food is produced, processed and distributed within food systems, and their ability to engage in processes that determine the policies and governance of food systems.[513]

f. Sustainability: refers to the long-term ability of food systems to provide food security and nutrition in a way that does not compromise the economic, social and environmental bases that generate food security and nutrition for future generations.[514]

Flooding
The overflowing of the normal confines of a stream or other body of water, or the accumulation of water over areas not normally submerged. Flooding includes river (fluvial) floods, flash floods, urban floods, pluvial floods, sewer floods, coastal floods and glacial lake outburst floods.[515]

Food environment
The physical, economic, political and sociocultural context in which consumers engage with agrifood systems to make decisions about acquiring, preparing and consuming food.[516]

Hazard
A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation.[517]

Healthy diets (or Diet quality)
Comprising four key aspects: diversity (within and across food groups), adequacy (sufficiency of all essential nutrients compared to requirements), moderation (foods and nutrients that are related to poor health outcomes) and balance (energy and macronutrient intake). Foods consumed should be safe.[518]

Heat wave
Abnormally hot and uncomfortable period.[519]

Healthy food environments
Food environment refers to the physical, economic, sociocultural and policy conditions that shape access, affordability, safety and food preferences. Healthy food environments are safe and supportive food environments that provide physical access to nutritious foods for healthy diets that reduce the risk of all forms of malnutrition, including undernutrition, overweight, obesity and diet related non-communicable

diseases.[520,521] Many elements of the food environment determine dietary patterns, while culture, language, culinary practices, knowledge and consumption patterns, food preferences, beliefs and values all relate to the way food is sourced, generated, produced and consumed.[522]

Highly processed foods

Foods that have been industrially prepared, including those from bakeries and catering outlets, and which require no or minimal domestic preparation apart from heating and cooking (such as bread, breakfast cereals, cheese, commercial sauces, canned foods including jams, commercial cakes, processed meats, biscuits and sauces).[523] Highly processed foods can contain very high quantities of salt, free sugars and saturated or trans fats, and these products, when consumed in high amounts, can undermine diet quality.

Nutritious foods

Safe foods that contribute essential nutrients such as vitamins and minerals (micronutrients), fibre and other components to healthy diets that are beneficial for growth, and health and development, guarding against malnutrition. In nutritious foods, the presence of nutrients of public health concern including saturated fats, free sugars, and salt/sodium is minimized, industrially produced trans fats are eliminated, and salt is iodized.[524]

Resilience

The capacity of individuals, households, communities, cities, institutions, systems and societies to prevent, resist, absorb, adapt, respond and recover positively, efficiently and effectively when faced with a wide variety of risks, while maintaining an acceptable level of functioning and without jeopardizing the long-term prospects for sustainable development, peace and security, human rights and well-being for all.[525]

Risk

Probability of occurrence of dangerous phenomena or trends multiplied by the repercussions if these phenomena or trends were to occur. Food insecurity risk is the probability of experiencing food insecurity as a result of interactions between threats, shocks or crises of natural or human origin and vulnerable conditions.[526]

Social protection

Social protection is understood as the set of policies, programmes and instruments aimed at preventing or protecting people against poverty, vulnerability and social exclusion during the different stages of their life cycle, with particular emphasis on groups in situations of vulnerability.[527] Social protection is made up of three main components: i) non-contributory schemes or social assistance; ii) contributory schemes or social insurance, and iii) labour market interventions. It is important that social protection policies and programmes are nutrition-sensitive, to address all forms of malnutrition including the underlying causes (such as poverty and social exclusion),[528] and gender-sensitive, to empower women and girls by providing access to resources, services and economic opportunities,[529,530,531] as well as adopting a life-cycle and intersectional approach to consider the specific needs and vulnerabilities of different population groups while contributing to building their resilience.

Subsistence or capital assets

The resources used and the activities carried out to survive. These assets are called livelihood assets and are defined in the Sustainable Livelihoods Framework according to the following five categories of "capital":

Economic or financial capital: base capital (periodic flows of money, credit or debt, savings and other economic assets).

a. **Human capital:** skills, knowledge and labour (includes good health and physical capacity).

b. **Physical capital:** productive assets, infrastructure (buildings, roads, production equipment and technologies).

c. **Natural capital:** reserves of natural resources (land, soil, water, air, genetic resources, forests, etc.) and environmental services (hydrological cycle, pollution sinks, etc.).

d. **Social capital:** resources (networks, social demands, social relationships, affiliations and associations).

The ways in which people use and combine their livelihood assets to obtain food, income, and other goods and services are defined as livelihood strategies.

Vulnerability

The conditions determined by physical, social, economic and environmental factors or processes that increase the susceptibility of an individual, community, assets or systems to the impacts of hazards.[532] Vulnerability to food insecurity is the range of conditions that increase the susceptibility of a household to the impact on food security in case of a shock or hazard.

Weather

Describes atmospheric conditions over a short period (minutes or days), whereas climate is how the atmosphere behaves over relatively longer periods of time (the long-term average of weather over time). The difference between weather and climate is a measure of time (see above definitions for climate, climate change, climate variability and climate extremes).[533]

ANNEX VI
METHODOLOGY AND FIGURES FOR THE ANALYSIS OF CLIMATE VARIABILITY ON THE PRODUCTION AND PRODUCTIVITY OF SELECTED CROPS IN BRAZIL, CHILE AND MEXICO SHOWN IN CHAPTER 6

The impacts of climate variability are assessed at the subnational level, utilizing data available for Brazil at the municipality level, for Chile at the regional level and for Mexico at the state level. To maintain clarity, these distinct divisions are termed here as "political units". For each political unit, the dataset includes climate and food production data. The climate data consist of time series detailing annual average temperature and annual total precipitation, sourced from the Climate Research Unit.[534] The raw data, initially a gridded dataset, underwent the same manipulation process as the Standardized Precipitation and Evapotranspiration Index (SPEI) data, leading to a single annual statistic for each political unit.

For Brazil, the data is derived from the Agricultural Production Survey (PAM) carried out by the Brazilian Institute of Geography and Statistics, and ranges from 1974 to 2022. Chilean data is sourced from the programme of Intercensus Agricultural and Livestock Statistics carried out by the Chilean National Institute of Statistics, covering the period from 1980 to 2022. Mexican data is obtained from the Statistics Agricultural Service from The Secretariat of Agriculture and Rural Development of Mexico, and the period considered is from 1980 to 2022.

To represent all crops, ten crops were chosen, and analysis at the political unit level was done for every available crop. The crops are banana, barley, cassava, maize, potato, soybean, sorghum, rice, tomato and wheat. These crops account for more than 80 percent of global kilocalorie production from all croplands.[535] For Brazil and Mexico, there is data for all crops. For Chile, data is available for barley, maize, potato, rice, tomato and wheat.

For every combination of crop/political unit, the following regression model is estimated:

$$y = \beta_0 + \beta_1 t + \beta_2 t^2 + \beta_3 tmp + \beta_4 tmp^2 + \beta_5 pre + \beta_6 pre^2 + \beta_7 tmp * pre + \beta_8 tmp^2 * pre^2 + u$$

The dependent variable y is the crop yield. t is the time (years) and is included to capture the effects of technological improvements. The linear term t accounts for slow changes, and the quadratic term t^2 for rapid changes. Climate information is represented by tmp (annual average temperature), and pre (annual total precipitation). The quadratic terms, tmp^2 and pre^2 account for extreme values. An interaction term $tmp * pre$ is included to capture the effect of the interaction between temperature and precipitation and the quadratic term $tmp^2 * pre^2$ accounts for the extreme values of this interaction. This specification is similar to models previously used in climate change literature.[536,537]

For each political unit, the model is estimated using observed yield and climate data from the first available year until 2016. The period of 2017 to 2022 is then used for cross-validation to ensure only in-sample predictions comparison. Once estimated, the overall-significance of the model is tested using the F-test, and models with p-value < 0.05 are considered as statistically significant. If the model is significant, it is used to predict the historical and current yield, and the difference between these predictions is the probable effect on crop yields due to a climate variability trend at the local level. This formulation is analogous to recent published works.[538]

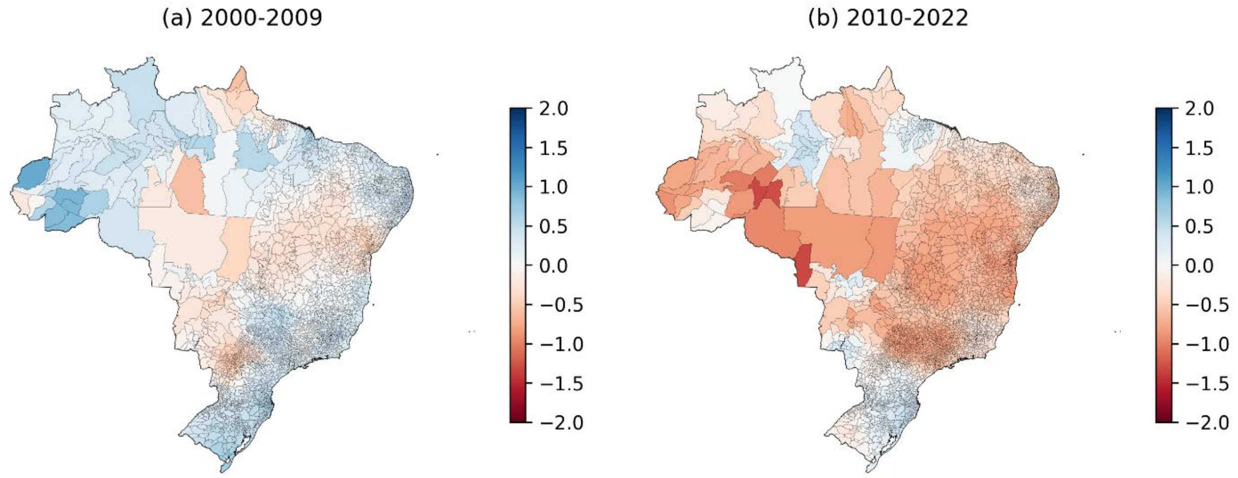
The model accounts for unobserved variables that affect crop yields but are not influenced by climate variability. By taking the difference between predicted historical and current yields, the model isolates the effects of climate trends while assuming that non-climate factors (such as soil quality or agricultural policies) impact yields similarly over time. Since these non-climate factors are assumed to remain constant in their influence, any variation in yields attributed to climate variables is isolated ensuring that the model focuses on climate-driven yield changes.

Although the current production is not directly used in the model, the data are incorporated into the results analysis to estimate yield differences at an aggregated level. Estimated changes in yield are then applied to current cultivated areas (based on observed data) to estimate potential losses.

Standardized Precipitation and Evapotranspiration Index in Brazil, Chile and Mexico

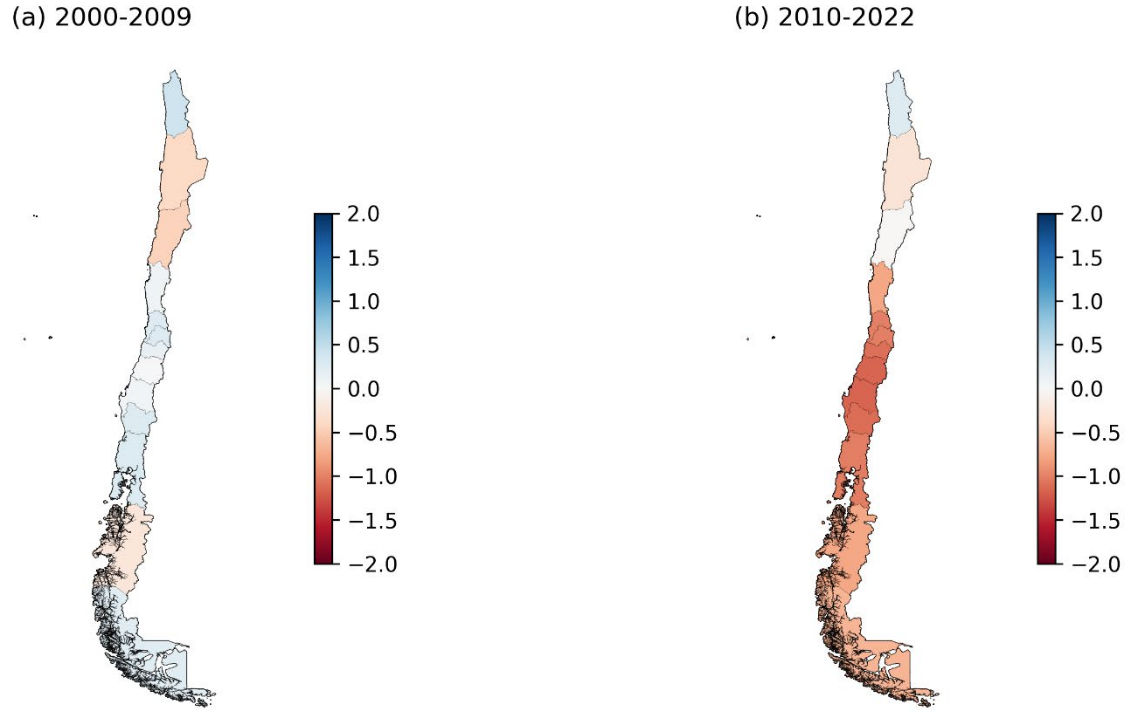
SPEI is a drought index based on climatic data. It can be used for determining the onset, duration and magnitude of drought conditions with respect to normal conditions in a variety of natural and managed systems. FIGURES VI.1, VI.2 and VI.3 show SPEI by municipality in the three countries analysed.

FIGURE VI.1.
Average Standardized Precipitation and Evapotranspiration Index by municipality in Brazil



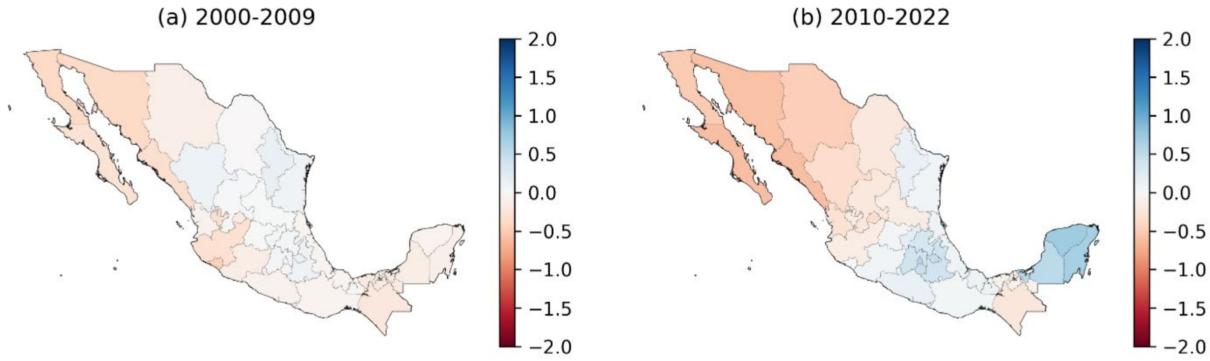
Notes: The Standardized Precipitation and Evapotranspiration Index (SPEI) is a drought index based on climatic data. It can be used for determining the onset, duration and magnitude of drought conditions with respect to normal conditions in a variety of natural and managed systems. Each municipality is represented by its average SPEI-12 across the period. Refer to the disclaimer page for the names and boundaries used in this map.
Source: Authors own elaboration based on precipitation data from the Climatic Research Unit (CRU) of the University of East Anglia .

FIGURE VI.2.
Average Standardized Precipitation and Evapotranspiration Index by region in Chile



Notes: The Standardized Precipitation and Evapotranspiration Index (SPEI) is a drought index based on climatic data. It can be used for determining the onset, duration and magnitude of drought conditions with respect to normal conditions in a variety of natural and managed systems. Each region is represented by its average SPEI-12 across the period.Refer to the disclaimer page for the names and boundaries used in this map.
Source: Authors own elaboration based on precipitation data from the Climatic Research Unit (CRU) of the University of East Anglia.

FIGURE VI.3.
Average Standardized Precipitation and Evapotranspiration Index by state in Mexico



Notes: The Standardized Precipitation and Evapotranspiration Index (SPEI) is a drought index based on climatic data. It can be used for determining the onset, duration and magnitude of drought conditions with respect to normal conditions in a variety of natural and managed systems. Each state is represented by its average SPEI-12 across the period. Refer to the disclaimer page for the names and boundaries used in this map.

Source: Authors own elaboration based on precipitation data from the Climatic Research Unit (CRU) of the University *of* East Anglia.

ANNEX VII
METHODOLOGY FOR THE RELATIONSHIP BETWEEN WATER AND FOOD INSECURITY IN COUNTRIES OF LATIN AMERICA AND THE CARIBBEAN SHOWN IN BOX 8

WATER INSECURITY IS STRONGLY ASSOCIATED WITH FOOD INSECURITY IN NATIONALLY REPRESENTATIVE SAMPLES FROM THREE LATIN AMERICAN COUNTRIES

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Methodology

Data collection

Data for these analyses were collected in Brazil, Guatemala and Honduras as part of the 2020 Gallup World Poll (GWP). Surveys were administered by telephone to samples of ~1 000 non-institutionalized individuals >15 years old. Participants were randomly selected through stratified probability sampling procedures, and post-stratified sampling weights were generated to adjust for non-response and to help ensure estimates were nationally representative.

Measurement of water insecurity and food insecurity

Water insecurity was measured using the Individual Water Insecurity Experiences (IWISE) Scale, which comprises 12 questions about problematic experiences with water in the prior year, including water-related psychosocial distress, difficulties with drinking and cooking, and disrupted hygiene practices.14 Each question has response options of never (scored 0), rarely (1), in some but not all months (2), and in almost every month (3), for a summed score range of 0–36. Each question contributes equally to the scoring. Moderate-to-severe water insecurity was defined as an IWISE score of 12 or greater.

Food insecurity in the prior year was measured using the eight-item Food Insecurity Experience Scale (FIES); each item can be affirmed (scored 1) or not (0). Standard Rasch model equating procedures recommended by the Voices of the Hungry project were used to estimate the probability of respondents having experienced moderate-to-severe food insecurity; a probability parameter of ≥0.5 was used to categorize respondents as moderately-to-severely food insecure for the purpose of analyses.

Measurement of effect modifiers

Standard sociodemographic data was also collected, as described elsewhere. Gender was determined by the interviewer as male or female. Age was self-reported in years; for ease of visualizing relationships, we categorized individuals into three age categories: 15–29, 30–49 and ≥ 50 to capture younger, middle, and older age groups. The older age group threshold was set as ≥ 50 years due to a sparseness of participants with ≥ 60 years. To obtain a harmonized categorization of urbanization across countries, GWP partnered with the European Commission to classify respondents as living in a rural area (thinly populated area), towns and suburbs/small urban area (intermediate density area) and cities/large urban area (densely populated) based on the respondents' reported postal codes or local administrative units. Annual per capita household income was estimated by GWP on the basis of respondents' reports of their monthly household income in local currency; GWP annualized and converted income data to INT$ using the World Bank's parity conversion factor for individual consumption purchasing power divided by the total number of household residents.Country-specific income quintiles were used to estimate how water and food insecurity relationships differed by income.

Covariates

In addition to gender, age, urbanicity and income quintile, other covariates were perceived adequacy of household income (not included in the model testing for an interaction with income quintile), current employment status, household size, marital status, education level and COVID-19 pandemic-related life disruption because these may be common causes of both water and food insecurity. Employment categories were defined by GWP as "employed", "underemployed", "unemployed" and "out of the work force". Household size estimates were generated by GWP by summing the number of residents <15 y and ≥15 y living in the household; for households over 10 people this was truncated at the country's 95th percentile. GWP defined marital status categories as single and never married, married or partnered, divorced, separated and widowed; divorced, separated and widowed categories were grouped together. Respondents reported their highest level of education, categorized by GWP as elementary (≤8 y basic education), secondary (9–15 y education), or tertiary (4 y of school beyond high school).

Data analysis

All analyses were conducted in Stata (v18.0) using the survey commands with GWP's post-stratification probability sampling weights and strata to account for the sampling design and adjusted for non-response and unequal probability of selection. For the first objective, multivariable logistic regression models were created to estimate the odds of moderate-to-severe food insecurity for those experiencing moderate-to-severe water insecurity when adjusting for socioeconomic covariates, estimated separately for each country.

In terms of the second objective, examining whether the odds of experiencing food insecurity in relation to water insecurity differed by gender, age, urbanicity and income, interaction terms between water insecurity and each of these covariates were included in country-specific logistic regression models.

Representations were then plotted of the probability of food insecurity in relation to water insecurity among different subpopulations within countries.

Results

The prevalence of moderate-to-severe water insecurity was highest in Honduras (47.2 percent), while the prevalence in Guatemala and Brazil was substantively lower (24.2 and 16.1 percent, respectively) (TABLE A-15).

Table A-15.
Sociodemographic and economic characteristics of Gallup World Poll participants from three Latin American countries with Individual Water Insecurity Experiences and Food Insecurity Experience Scale data in 2020 (n=2 911)

	Brazil 2020 (n=972)[a]	Guatemala 2020 (n=1,007)[a]	Honduras 2020 (n=932)[a]
Water insecurity (weighted %)b			
IWISE score <12	83.3	76.8	51.3
IWISE score ≥12	16.7	23.2	48.7
Gender (weighted %)			
Male	49.0	50.1	47.7
Female	51.0	49.9	52.3
Age group (weighted %)			
15-29 years	34.2	45.3	49.6
30-49 years	36.8	36.7	35.5
≥50 years	29.0	18.0	14.9
Degree of urbanization (weighted %)			
Rural areas	17.6	19.1	30.1
Towns and semi-dense areas	20.5	29.2	28.4
Cities	61.9	51.7	41.5
Per capita annual income in international dollars, median (IQR)	3 331 (1 624.6246)	832 (281.1872)	646 (231.1475)
Subjective income (weighted %)			
Getting by or living comfortably on present income	68.0	46.5	26.9
Difficulty getting by on present income	32.0	53.5	73.1
Total number living in household for per capita income, mean (SD)	3.59 (1.85)	5.92 (2.91)	5.31 (2.49)
Marital status (weighted %)			
Single	41.1	38.9	40.0
Married/partnered	49.1	53.3	53.4
Separated/divorced/widowed	9.8	7.9	6.6
Employment status (weighted %)			
Employed	48.9	52.6	35.7
Underemployed	10.1	8.8	15.5
Unemployed	14.6	10.1	19.3
Out of workforce	26.4	28.5	29.5
Level of education (weighted %)			
Elementary (8 years or less)	29.2	43.4	58.1
Secondary (9-15 years)	60.7	52.6	35.4
College (4+ years)	10.1	3.9	6.4
Extent to which life has been affected by COVID-19 pandemic (weighted %)			
Not affected by the pandemic	14.5	7.2	20.4
Somewhat affected by the pandemic	43.8	44.8	28.1
Very much affected by the pandemic	41.7	48.0	51.6

Notes: a This is the sample of respondents with complete data, excluding the respondents in Brazil (n=31), Guatemala (n=147) and Honduras (n=38)) who were missing water insecurity, food insecurity, or covariate data.
b The prevalence of water insecurity is slightly different in this sample than the national prevalence estimates reported for Figure 1 because adults with missing covariate data have been excluded here.

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