



**Food and Agriculture
Organization of the
United Nations**



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FAO 2020–2021 La Niña advisory

Potential impacts on agriculture and
food security in high-risk countries
(revised version)

Introduction

The second half of 2020 saw the emergence of a moderate to strong La Niña event that is causing extreme weather in many parts of the world. The meteorological phenomenon that affects temperatures, precipitation and storm patterns is expected to last into next year, according to the World Meteorological Organization (WMO). The last strong La Niña event was from late 2010 to early 2011, followed by a moderate event from late 2011 into 2012 and a weak one in from late 2017 into 2018. The 2020–2021 La Niña episode puts some countries in Southern Africa, the greater Horn of Africa, Asia and the Pacific at high risk of incurring agricultural losses and seeing food insecurity conditions worsen. As a result, these countries should be prioritised for further monitoring, analysis and early action.

This advisory provides an overview of the historical impact of La Niña and an outlook of the potential effects on the agriculture sector in 2020–2021. Importantly, it also offers specific recommendations for anticipatory actions to mitigate the impacts of La Niña before it creates large-scale food security emergencies.

What is La Niña?

La Niña is a recurrent global atmospheric-oceanic phenomenon associated with a decrease in sea surface

temperatures in the central tropical Pacific Ocean and a sustained strengthening of the trade winds. A La Niña event develops approximately every two to seven years and lasts from six months to two years. A global La Niña event is declared after the central Pacific Ocean and the atmosphere show signs of certain atypical conditions for a prolonged period of time, usually over a period of three months. La Niña increases the risk of heavy rainfall and flooding in some parts of the world and of drought through reduced rainfall in others. In some instances and for some regions, the impact of La Niña also depends on its interaction with other climatic events, such as the Indian Ocean Dipole (IOD).

The impact of La Niña on agriculture and food security can be severe. The event from 2010 to 2012¹ was one of the strongest on record and caused the 2010 Pakistan floods. The same event also led to above-average tropical cyclone activity in the North Atlantic Ocean during the 2010, 2011 and 2012 hurricane seasons.

The extent of La Niña's impact on agriculture and food security depends on a complex interplay of meteorological, seasonality and vulnerability factors. As a result, impact patterns of global La Niña events are variable and do not necessarily materialize during every occurrence. While the intensity of a La Niña event generally affects the severity of its global impacts, there is always potential for even a weak or moderate episode to generate serious humanitarian impacts in some regions and on the agricultural sector in particular. This uncertainty makes it especially critical to systematically analyse weather forecasts, identify vulnerabilities and determine risks with the help of regional and national climate outlooks and strong early warning systems.

¹ The 2010–2011 La Niña, which was classified as a strong event, was followed by a moderate event in 2011–2012. This event was considered as “La Niña Modoki”.

2020–2021 La Niña forecast

In October 2020, the World Meteorological Organization declared the development of a La Niña episode that is expected to last into next year and affect temperatures, precipitation and storm patterns in many parts of the world.

Likewise, the November 2020 La Niña forecast from Columbia University’s International Research Institute (IRI) for Climate and Society points to a 95 percent chance of La Niña continuing through January to March 2021. There is a 65 percent chance it might last into the spring of 2021 (March–May). WMO projects the intensity of the event to be medium to strong.

A framework for anticipatory action to mitigate the impact of La Niña

In the immediate aftermath of the severe El Niño in 2015 and 2016, the humanitarian and development community called for a framework that could guide the way partners monitor both El Niño and La Niña events and initiate anticipatory actions to mitigate their impacts. As a result, the Food and Agriculture of the United Nations (FAO) and the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), together with other partners, developed the Inter-Agency Standard Operating Procedures for Early Action to El Niño/La Niña Episodes.

Identifying high risk countries

When the likelihood of a La Niña event happening in July 2020 rose to 55 percent, global partners met to carry out an initial analysis to identify the countries at highest risk of La Niña impacts. This process was driven by the El Niño Southern Oscillation (ENSO) Global Cell of the Inter-Agency Standing Committee (IASC), which includes FAO, the International Federation of Red Cross and Red Crescent Societies (IFRC), IRI, OCHA, the United Nations Children’s Fund (UNICEF), WMO, the World Health Organization (WHO), the World Food Programme (WFP) and others.

Together, they prioritized a set of countries for further monitoring, analysis, support and anticipatory action based on the humanitarian impact La Niña was likely to have on each. A consultative process produced a list of high-risk countries in September 2020 focusing on the following information:

- The IRI La Niña and Rainfall map (Figure 1) helped identify countries that are historically impacted by La Niña and the specific conditions they experience (dry or wet).
- Global and regional seasonal forecasts for the period from October 2020 to March 2021 highlighted countries with anomalous rainfall prospects that would likely experience the impact of La Niña.²
- The INFORM Index for Risk Management provided country-specific thresholds for vulnerability and lack of coping capacity. All countries selected had medium values for vulnerability (3.3 and above) and medium values for lack of coping capacity (4.7 and above) in the Index.
- Agricultural seasonality analysis helped determine the stage of crop growth that could be affected during the outlook period and the impact this could have on food security.
- Additional aggravating factors, including health, security and macro-economic constraints further determined to what extent countries would be vulnerable to additional shocks.
- Expert opinion and technical judgment during discussions provided additional perspective in particular cases when a country fell outside some of the above-mentioned parameters.

Additional countries of concern

FAO included additional countries in this advisory after updated seasonal climate forecasting information became available in the months following the ENSO Cell analysis. These countries are: the Democratic People’s Republic of Korea, Iraq, Madagascar, Mozambique, Pakistan and Zimbabwe.

It should be noted that the list of high-risk countries presented here is neither fixed nor final. It is the result of a global analysis and should be verified against new and more detailed national forecasts and more nuanced understandings of risk and vulnerability at a national level. In addition, meteorological forecasts used in the

² The main source used for this was the IRI Seasonal Climate Forecast. The seasonal climate outlooks produced by some Regional Climate Outlook Forums (RCOFs) and other global forecasts (e.g. the European Centre for Medium-Range Weather Forecasts (ECMWF)) were also taken into consideration.

analysis are probabilistic, which implies a certain degree of uncertainty over the scenarios that may develop. The countries included in the high-risk list are not the only countries that need to be concerned about a La Niña event. Rather, they are those that, based on a number of factors outlined above, should be prioritized for international support in further analysis and anticipatory action.

In particular, the advisory does not include a specific section on countries in the Americas. Some countries in Central America and the Caribbean have already experienced strong floods as a result of the interplay of La Niña conditions and the hurricane season. High probability of above-average rain in the first quarter of 2021 raises the likelihood of generally conducive conditions for the start of the 2021 *primera* season in Central America, but if excessive rainfall materializes, it could be harmful for apante bean production in Honduras and Nicaragua. Countries in the northern part of South America are likely to benefit from above-average rainfall associated with La Niña, although intense rainfall could have a negative impact in some areas. La Niña conditions have already been felt in other areas of both North and South America, and potential for further impact exists. Although coping capacity is considered

sufficient to cushion against the humanitarian repercussions in most countries, monitoring should continue, especially in Bolivia, where drier-than-average conditions have already been observed in some areas.

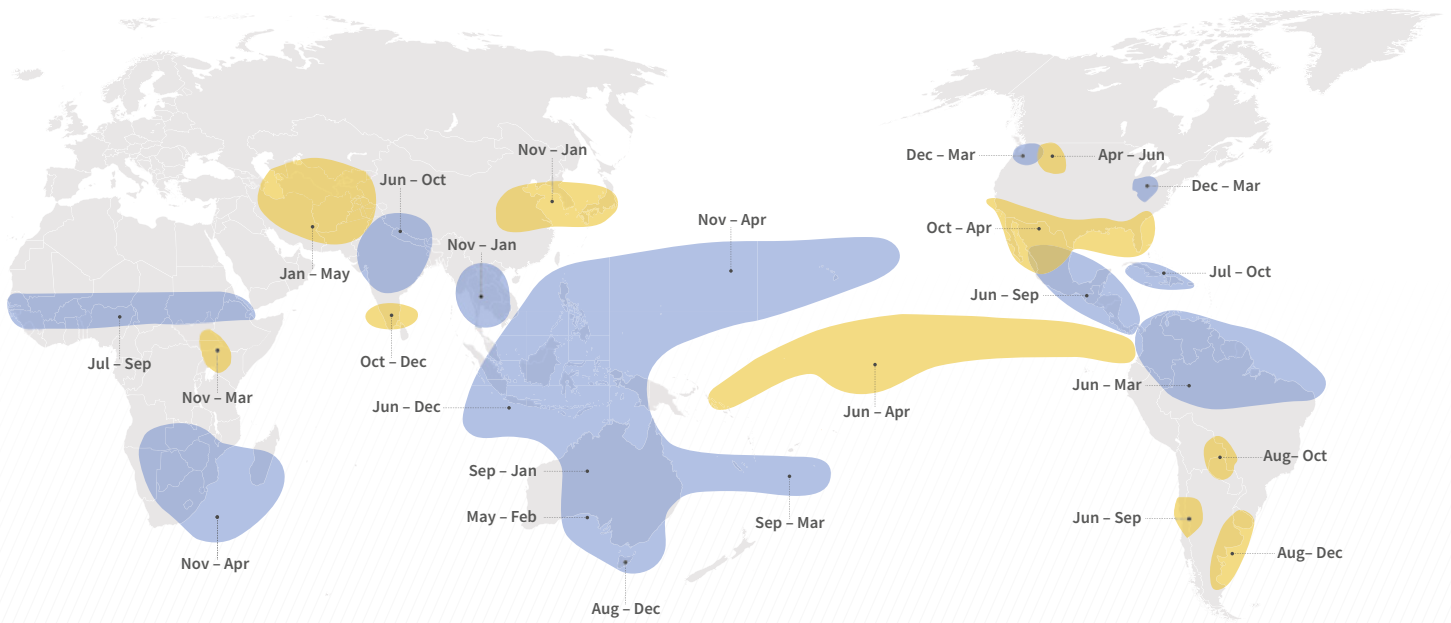
It is therefore highly recommended that the regions and countries at risk continue to carefully monitor meteorological forecasts with the understanding that their level of risk might change.

It is worth noting that food security in high risk countries could also be affected by the impacts that La Niña might have on agricultural production in other countries, particularly the main global food producers. Low outputs of food staples in these countries could result in lower exportable availabilities and higher international prices, which would raise import costs and put pressure on retail prices to the detriment of consumers, especially in net food-importing developing countries. This calls for continuous monitoring of conditions at the international level, particularly among the main food producing countries.³

³ For the latest outlook on the global food supply and demand situation, and international food prices, please refer to FAO's [World Food Situation portal](#).



Figure 1. La Niña and rainfall



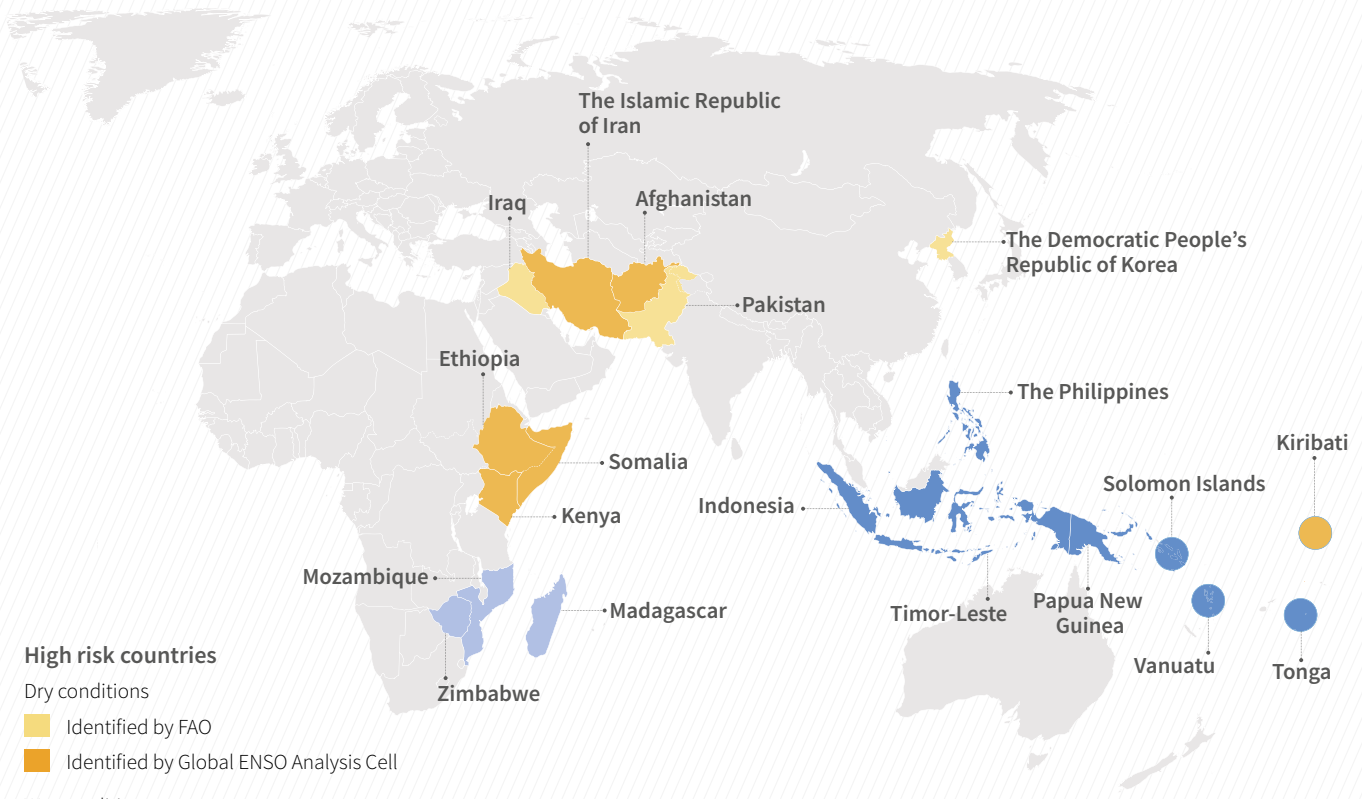
Historical impact

- Dry conditions
- Wet conditions

Source: Turner, J. 2020. New data and tools bring a deeper understanding of El Niño, IRI

La Niña conditions in the tropical Pacific are known to shift rainfall patterns in many different parts of the world. Although they vary somewhat from one La Niña to the next, the strongest shifts remain consistent in the regions and seasons shown on the map.

Figure 2. La Niña 2020–2021: High-risk countries (October 2020 to April 2021)



High risk countries

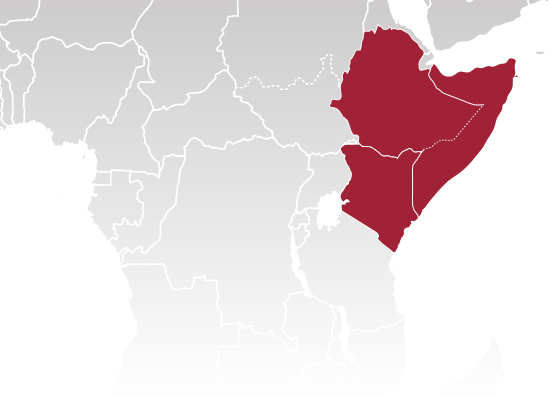
Dry conditions

- Identified by FAO
- Identified by Global ENSO Analysis Cell

Wet conditions

- Identified by FAO
- Identified by Global ENSO Analysis Cell

Source: Global ENSO Analysis Cell – IASC and FAO



Greater Horn of Africa

**High-risk countries facing dry conditions:
Ethiopia, Kenya and Somalia**

Historical patterns

Historically, localized areas of the Greater Horn of Africa tend to experience drier-than-normal conditions during La Niña events, particularly from November to March. From 2010 to 2011, La Niña contributed to one of the worst droughts in the region. Alongside other drivers like conflict and humanitarian access constraints, it pushed almost 10 million people into humanitarian emergency and led to a famine declaration in south-central Somalia. Poor performance of the 2010 *Gu* rains during the primary cropping season (April–June) was followed by the total failure of the *Deyr* rains (short rains) during the secondary cropping season from October to December that year. The results were crop failure, reduced labour demand, poor livestock body conditions and excessive animal mortality.

Between March and June 2020, the region has benefitted from exceptionally abundant *Gu* rains (the long rains), which have resulted in improved crop and livestock production in most areas. At the same time, some parts of the region have faced heavy rainfall and widespread flooding, with many weather stations recording their highest rainfall in 40 years. These floods and flash floods have directly affected almost 2.4 million people and displaced almost 1.1 million across Ethiopia, Kenya, Somalia and Uganda.

Current weather forecast

October to December is an important rainfall season for Burundi, Kenya, Rwanda, Somalia, southeastern Ethiopia,

the United Republic of Tanzania and Uganda. According to the Greater Horn of Africa Climate Outlook Forum, a drier-than-usual short rainy season from October to December 2020 was foreseen in most parts of the region. This included Burundi, southern Ethiopia, Kenya, Rwanda, the United Republic of Tanzania, most of Uganda and southern, central and northwestern Somalia. Furthermore, warmer-than-usual temperatures were expected during the same period across most of the region, with particularly high temperatures in western Uganda, central South Sudan, northeastern Sudan, parts of southern Kenya and the Tanzanian coast. So far the October to December season has seen a mixed performance across the region with some localized rainfall deficits in southeastern Ethiopia, eastern Kenya and northern and southern Somalia.

The outlook for March to May 2021, when the long rains start, also points to dry-to-average conditions in Kenya, northwestern Tanzania, Burundi, Rwanda, northwestern Uganda, southern and northwestern Somalia, Ethiopia and Djibouti. Wetter-than-average conditions are likely to occur in the United Republic of Tanzania, western Kenya, eastern Uganda, South Sudan, western Ethiopia and northeastern Somalia.

Potential impact on agriculture and food security

While initial seasonal climate forecasts pointed to below-average *Deyr* seasonal rains over most of the Greater Horn of Africa, the performance of this rainy season has been mixed and the production prospects for the second season harvests, to be gathered in early 2021, vary across the countries. This will also affect rangeland and livestock conditions in pastoral areas. While seasonal rains have been consistently above-average over bimodal rainfall areas covering most of **Uganda** and the northeastern part of the **United Republic of Tanzania**,⁴ this has not been the case for Kenya, Somalia and southeastern Ethiopia. These areas have seen below-average precipitation amounts and/or extremely erratic rainfall distribution that have had a negative impact on rangeland and crops.

⁴ Uganda and the United Republic of Tanzania were identified by the ENSO Cell as high-risk countries; however, given the currently observed beneficial rainfall conditions, both countries have been dropped from the list of this advisory.

In coastal and marginal agricultural areas of southeastern **Kenya**, dry conditions prevailed in October, which delayed planting operations and affected crop development. Although abundant rains in November improved vegetation conditions and lifted crop prospects, a full crop recovery is unlikely and a delayed and below-average short-rains harvest is expected. While this should not have a major impact on the national cereal output, the short-rains harvest in these areas accounts for about 60 to 70 percent of the yearly cereal output and is therefore very important for the food security situation in these structurally vulnerable areas.

In key cropping areas of southern **Somalia**, rains have had an extremely erratic temporal distribution, with a prolonged dry spell in October that had a negative impact on crop growth and vegetation conditions. Torrential rains in the first half of November benefited crop conditions, but also resulted in substantial losses due to floods, particularly in maize-producing areas along the Juba and Shabelle rivers and in the “sorghum belt” of the Bay region. The unfavourable weather conditions, made worse by the ongoing desert locust infestation, are expected to result in a second consecutive low harvest.

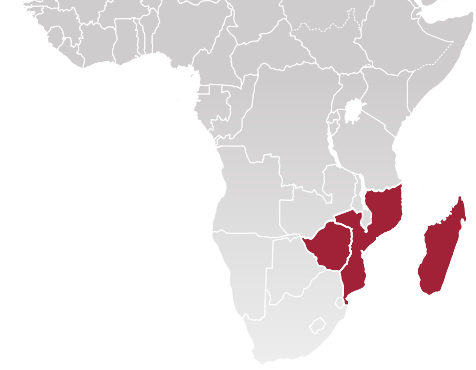
The performance of the October–December rains was also mixed over pastoral areas of northern and eastern Kenya, southeastern **Ethiopia** and central and northern **Somalia**. The Somali region in southeastern Ethiopia received poor seasonal rains, as did eastern **Kenya**

and northern Somalia. This resulted in below-average rangeland conditions. In addition, several pastoral areas of Somalia reported significant pasture losses due to desert locust. Although livestock body conditions are currently average to above-average, a faster-than-usual deterioration is expected during the dry season from January to March in the areas that are experiencing poor rains and locust-induced pasture losses.

Recommended anticipatory actions

Anticipatory action should focus on preventing a decline in food security under the impacts of localized dry spells and torrential rains in affected areas of Ethiopia, Kenya and Somalia. Furthermore, support should be provided ahead of planting for the long-rains season in Kenya and *Belg* and *Gu* seasons in Ethiopia and Somalia, starting in the first months of 2021:

- Support vulnerable households ahead of planting for the long-rains season in Kenya, and *Belg* and *Gu* seasons in Ethiopia and Somalia, through provision of agricultural inputs and cash (cash+).
- Intensify monitoring and control of desert locusts to prevent further spread and related damages.
- Conduct disease surveillance, vaccinations and treatment of core breeding stocks.
- Support vulnerable households in pastoral areas with animal supplementary feed before animal conditions start deteriorating.



Southern Africa

**High-risk countries facing wet conditions:
Madagascar, Mozambique and Zimbabwe**

Historical patterns

In Southern Africa, La Niña is generally associated with a higher probability of above-average rainfall from around November to April, a period that corresponds to the main cropping season for most countries in the region.

Although these conditions tend to be conducive for agricultural production, there are potential risks associated with La Niña. Most notably, there is an increased chance of flooding due to excessive precipitation, which could damage or destroy standing crops, wash away seeds, increase livestock morbidity and mortality and cause population displacements. Heavy rain brought on by the effect of La Niña in 2009 caused the worst floods in four decades to hit Namibia, and also resulted in extensive damage in Zambia that was estimated at several million US dollars. Flooding can also damage agricultural infrastructure, such as wells and irrigation systems, and increase the risks of pest infestations; in early November, heavy rainfall had already resulted in flash flooding in northeastern South Africa, central Mozambique and eastern Zimbabwe. Even without floods, wetter or more humid conditions raise the likelihood of an increased prevalence of crop pests and of crop and animal diseases. This means the forecast for normal to above-normal rainfall raises the risk of further African migratory locust (AML) outbreaks, if the current outbreak is not quickly brought under control.

Current weather forecast

Weather forecasts indicated that most of Southern Africa would receive normal to above-normal rainfall amounts for the period October to December 2020, except for northwestern Angola, the Democratic Republic

of the Congo, most of eastern Madagascar, northern Malawi, northern Mozambique and northeastern Zambia, where normal to below-normal rains were expected. The rainfall season started well in many parts of the region. Between September and early November, parts of Botswana, Lesotho, Mozambique, South Africa and Zimbabwe saw average to above-average rainfall. In contrast, below-average rainfall was recorded in parts of central and eastern Madagascar where the onset of rains has been substantially delayed. January to March 2021 is expected to bring normal to above-normal rainfall in most parts of the region.

While the regional climate outlook portends to overall good prospects for the upcoming agricultural season, localized flooding might occur in the coming months. There is also a higher risk of increased cyclone activity in the southern Indian Ocean between October 2020 and May 2021, which puts the coastal countries of Mozambique and Madagascar in higher danger of flooding.

Potential impacts on agriculture and food security

There is a higher-than-normal probability of increased cyclone activity between November 2020 and April 2021 in the southwest Indian Ocean. At the same time, prevailing oceanic and atmospheric conditions create an increased likelihood that cyclone trajectories will be westward, raising the chances of landfalls in **Madagascar** and **Mozambique**. Cyclones can cause substantial losses of food supplies, and represent a serious threat to food security. In the near-term, losses of stored grains would increase the risk that households face shortfalls in food supplies prior the main harvest period. Any food losses before the start of the main harvest in March 2021 would be particularly acute, considering that household food stocks are normally at their lowest level during the lean season. Looking further ahead, as most of the main 2021 cereal crops are expected to be planted by January 2021, periods of excessive rainfall and strong winds could result in damages to and losses of standing crops, potentially curtailing future food supplies in 2021. Cyclones usually damage building infrastructure and reduce access to clean water, which can further worsen local food security. These risks come against the backdrop of a generally heightened vulnerability of households in both countries, as many have experienced income losses because of the COVID-19 pandemic. Therefore, their capacities to adequately prepare for the impact of cyclones and to recover from it are likely to be limited.



In **Zimbabwe**, the latest weather forecasts point to average to above-average seasonal rainfall amounts that could result in a recovery in cereal production in 2021, following two consecutive years of weather-reduced harvests. That said, in previous La Niña years, seasonal rainfall amounts have frequently been above-average and the risk of excessive rainfall and associated agricultural damage remains as long as the weather phenomenon is present. Enhanced rainfall can also benefit locust breeding and increase the threat from the ongoing outbreaks of AML in some parts of the country. High rainfall may result in higher incidences of pest and disease outbreaks, with the associated control challenges. Additionally, the country has been affected by cyclones, most recently in 2019, and forecasts point to a higher-than-normal probability of above-average cyclone activity during the current season. This, in turn, increases the risks to food security for local populations. Low resilience capacity, however, is the overriding factor that currently puts the population at a heightened risk. Two years of reduced harvests, exceptionally high inflation rates and the negative impacts of the COVID-19 pandemic, including the loss of jobs and incomes, have diminished households' ability to withstand and recover from any type of shock. According to the recently released Integrated Food Security Phase Classification (IPC) analysis, some 2.7 million people were estimated to face high levels of acute food insecurity (IPC Phase 3 and above) in the period of October to December 2020. At the peak of the lean season, between January to March 2021, about 3.3 million people are projected to face high levels of acute food insecurity (IPC Phase 3 and above) and rural households are therefore likely to require assistance to cope with any level of agricultural losses.

Recommended anticipatory actions

Between December and March, anticipatory action to support crop production and livestock health could prevent further food security deterioration across the region.

In Madagascar and Mozambique:

- Establish food storage sites and provide superior storage equipment (e.g. hermetic bags) in order to reduce post-harvest losses caused by above-normal rainfall and potential cyclones.

- Ensure proper shelter, veterinary care and adequate livestock feed in the areas most at risk of cyclones.
- Distribute vegetable gardening inputs and short-cycle seeds (rice, tubers and pulses) to ensure availability of food ahead of the harvest period.

In Zimbabwe, anticipatory action should focus on supporting vulnerable farmers and livestock owners in taking advantage of the forecast normal rainfall, while also monitoring the risk of localized flooding:

- Scale up crop and vegetable input support to most vulnerable farmers to cushion them against the losses incurred during the past consecutive droughts and the increasing costs of key agricultural inputs.
- Promote capacity building and support to farmers on water-harvesting techniques.
- Increase surveillance of AML, other locusts and fall armyworm, as well as general pests and diseases that pose a threat to Southern Africa.
- Scale up efforts to enhance and protect animal health with particular emphasis on the provision of dipping chemicals to ensure a regular dipping regime and appropriate vaccination of livestock.
- Build the capacity of farmers and provide support on post-harvest management and processing to ensure farmers preserve their harvests and minimize any further losses.

In all three high-risk countries:

- Strengthen community-based early warning systems (especially in flood prone areas) and sensitize communities on how to link warnings to anticipatory action.
- Monitor cyclone paths and prepare for providing support (e.g. storm advisories and unconditional cash) to potentially affected households upon early warnings and ahead of landfall.



Southwest Asia and the Near East

**High risk countries facing dry conditions:
Afghanistan, the Islamic Republic of Iran,
Iraq and Pakistan**

Historical patterns

In Southwest Asia and the Levant, La Niña events have been known to lead to a reduction in rainfall from January through May in an area encompassing Afghanistan and extending through northern Pakistan and the Islamic Republic of Iran, as well as the southeastern tip of Iraq.

Drier-than-average conditions associated with La Niña had, in the past, affected winter crops in the area. For example, in Afghanistan, the 2017–2018 winter wet season was characterized by persistent dryness across most of the country, combined with high temperatures, which were likely induced by La Niña conditions. In April 2018, the Government of Afghanistan officially declared a drought emergency. Drought continued during the spring and summer months and caused substantial cumulative rainfall deficits throughout the country, resulting in the lowest wheat production since 2011.

Current weather forecast

The latest seasonal weather forecast suggests that an area from the Levant to Southwest Asia, including Afghanistan and parts of the Islamic Republic of Iran and Iraq as well as northern Pakistan, is likely to experience below-normal rainfall from October 2020 through the first quarter of 2021. Such conditions are expected to continue through the first half of 2021 in parts of the region according to forecasters.

The conditions could affect the winter season snow accumulation, which is critical for water access during the spring and summer agricultural seasons. Decreased availability of irrigation water is likely to have a negative effect on the level of agricultural production, thus constraining opportunities for casual labour, including in rural areas. Risks are also significant for pastoral households, as below-average rainfall conditions could result in the early depletion of pasture and lead to forced sales of livestock. Such drivers would affect communities already suffering from the ongoing economic crises exacerbated by the secondary effects of the COVID-19 pandemic, including persistently low oil prices for hydrocarbon exporters, high prices of basic commodities, conflict and insecurity.

Potential impact on agriculture and food security

In **Afghanistan**, winter grains are usually planted in October and November, after seasonal rains sufficiently replenish soil moisture. Erratic rainfall in October and early November 2020 was not conducive for planting and crop establishment. Favourable precipitation in the middle of November partially eased soil moisture deficits. Reports indicate that, as of late November, there were sufficient minimal amounts of soil moisture for winter wheat planting, and farmers continued sowing operations. There is a high probability that cumulative precipitation amounts in the 2020–2021 winter season would be below-average, stemming from La Niña conditions across most of the country. That said, if rainfall distribution is favourable and coincides with the critical stages of crop development, the negative impact on yields might be limited. Inadequate winter precipitation negatively affects the establishment and development of key grains such as wheat and barley. Lack of snow cover makes crops susceptible to frost kill. In addition, reduced snowfall constrains the availability of irrigation water from melted snow for summer crops. At greatest risk are northern rainfed production areas. Further, reduced rainfall and/or snowpack formation and melt in the wet season hamper pasture growth conditions thus constraining access to fresh fodder for herders. Lastly, below-average precipitation, coupled with warmer-than-average temperatures, is expected to create conducive conditions for pests and insect infestations during spring (March–April), as previously observed in 2020.



Reduced agricultural production constrains farmers' income and limits livelihood opportunities for casual agricultural labour, as well as nomadic herders' and livestock keepers' access to fodder or feed for their livestock. Limited access to water could further affect the body conditions of their animals. The key drivers that underpin food insecurity in the country remain present as well, including conflict, limited livelihood opportunities, high food prices and natural disasters. The COVID-19 pandemic has been exacerbating many of these underlying issues.

Between November 2020 and March 2021, a period that corresponds to the lean season, over 13 million people (42 percent of the total population) are likely to experience high levels of acute food insecurity (IPC Phase 3 or above), out of which nearly 4.3 million people will likely be in Emergency (IPC Phase 4).

In **Iraq** and in parts of **the Islamic Republic of Iran**, substantial rainfall in November eased concerns of an early season drought. As of late November, planting of winter grains, mainly wheat and barley, continued under favourable weather conditions. Both countries, however, have areas that are likely to see below-average precipitation in the 2020–2021 winter season as a result of La Niña conditions. The impact of La Niña-induced weather patterns on total production in Iraq and the Islamic Republic of Iran will depend on the geographical distribution of the rains and the timing coinciding with the critical growth stages. Both countries are struggling with economic downturns, amplified by low international oil prices and, in the case of the Islamic Republic of Iran, economic sanctions. In Iraq, public sector employees are struggling under delayed salary payments, while casual labourers have seen their income-generating opportunities shrink as a result of measures to contain the COVID-19 pandemic. Both are decreasing people's purchasing power and increasing the risk of food insecurity.

In **Pakistan**, La Niña could affect the 2021 wheat output, the country's main staple food, particularly in the rainfed areas. In addition, reduced snowfall as a result of La Niña in northern parts of the country may reduce irrigation supplies in the spring months, which normally come from melting snow. This is particularly concerning in light of the already high price of wheat flour in 2020, which reached record highs in most markets in October. Should a lack of irrigation cause production shortfalls, this would further drive up the price of wheat flour and constrain people's access to food.

Recommended anticipatory actions

Anticipatory actions are needed to support vulnerable communities affected by potential below-average precipitation over the 2020/21 winter season in parts of Afghanistan, the Islamic Republic of Iran and Iraq. Should below-average rainfall continue into the spring and summer seasons, it would result in a cumulative period of dry conditions. In Pakistan, action is needed to mitigate rainfall shortages ahead of the spring season.

- Where available, scale up social protection programmes to provide cash to vulnerable households, particularly to families who may experience a deterioration in their food security due to direct and indirect effects of below-average harvests. This can include, for example, low-income households, displaced households, single-headed households, or those who are elderly or living with a disability.
- Distribute concentrated animal feed and care kits containing minerals and nutritional supplements to food insecure livestock keepers, particularly the nomadic Kuchis in Afghanistan. This will allow herders to protect their livestock assets in areas where pasture is expected to deplete due to below-average rainfall.
- In Afghanistan, distribute drought-tolerant summer crop seeds (including maize and mung beans) and install rainwater harvesting equipment that allows food insecure farmers to mitigate the impact of reduced snowfall on water availability for the spring-summer planting season that typically begins in April–May.
- In Afghanistan, enhance institutional capacities on surveillance of pests and insect infestations in the crop sector and improve risk communication (advisories), along with cereal crop plant protection actions during the spring season.
- In the Islamic Republic of Iran and Iraq, distribute tools and drought-tolerant seeds ahead of the secondary spring and summer cropping seasons.
- In Pakistan, distribute drought-tolerant seeds and tools ahead of the maize and rice seasons beginning in April and May, respectively.



East Asia and the Pacific Islands

High-risk countries facing wet and dry conditions: Indonesia, the Philippines, Papua New Guinea, Solomon Islands, Timor-Leste, Tonga and Vanuatu (above-average rainfall); the Democratic People's Republic of Korea and Kiribati (drier-than-normal conditions)

Historical patterns

In much of Southeast Asia and the Pacific, La Niña is typically associated with wetter-than-normal conditions. While the cyclone season for Southeast Asia runs throughout the year, tropical cyclones typically develop between May and October. La Niña can shift this trend, however, and potentially induce this type of hazard at different times. In some Pacific Islands, La Niña is associated with drier-than-normal weather for a long period, typically from June until the following April. In the Democratic People's Republic of Korea, likewise, La Niña can cause drier-than-average conditions.

Enhanced rainfall could benefit crop development in some areas of East Asia and the Pacific Islands. That said, La Niña triggers excessive rains and can also increase the risk of flooding, particularly in low-lying agricultural lands. This can result in extensive damage to standing crops and an increase of pest and disease outbreaks. It can also heighten the potential for landslides.

Current weather forecast

The Association of Southeast Asian Nations (ASEAN) Specialized Meteorological Centre is forecasting

above-normal rainfall between November 2020 and January 2021 in areas of the ASEAN region that lie south of the equator, as well as the Philippines and parts of Viet Nam, the Lao People's Democratic Republic and Cambodia. In the Pacific, the Pacific Islands Climate Outlook Forum (PICOF) predicts that rainfall will likely be above normal for most Islands, except for some along and near the equatorial Pacific. This forecast is echoed by the New Zealand National Institute of Water and Atmospheric Research. Its November 2020–January 2021 climate outlook highlighted that Tuvalu, Kiribati and Nauru experienced water stress over the past six months and dry conditions are forecast for the next three-month period. By contrast, the remaining Pacific Islands are expected to have above-average rainfall. In October 2020, the South Pacific region entered the cyclone season that lasts until April 2021, and at least three severe cyclones of category 3 or higher may occur during this period.

Countries identified as being at high risk of increased rainfall are Timor-Leste, Indonesia and the Philippines in Southeast Asia and Papua New Guinea, Solomon Islands, Vanuatu and Tonga in the Pacific. For all these countries, weather conditions should be monitored for potential risk of flooding and storm surge, particularly during the cyclone season. These conditions can also compound plant pests and transboundary diseases, including African swine fever (ASF). That said, higher-than-normal rainfall amounts also have positive impacts on agriculture, as they benefit crop development and refuel water stocks.

Potential impacts on agriculture and food security

In **Timor-Leste**, La Niña conditions will coincide with the main 2020/21 maize and rice cropping season and the lean season, which runs from November to February. Above-average rains are expected to benefit crop production. At the same time, they will also carry the possibility of flooding and associated crop damages, as well as losses to food stocks, livestock and fishing equipment. Access to markets may be compromised as roads may become impassable due to rains, particularly in the highlands. In addition, the COVID-19 pandemic and ASF have caused substantial income losses for most farming households. The growing threat of fall armyworm may compound the situation, with increasing spread reported in several areas in late 2020 and early 2021.



According to a Rapid Food Security Assessment conducted by the Ministry of Agriculture and Fisheries, as of mid-May 2020 about 40 percent of households reported adopting negative coping mechanisms as a result of the COVID-19 pandemic and other shocks. Consequently, farmers and livestock owners are already in a precarious economic situation, raising very real risks that La Niña-induced conditions could further exacerbate livelihood challenges faced by a large number of rural households across Timor-Leste.

According to forecasts by the Indonesian Meteorology, Climatology and Geophysics Agency, La Niña conditions are likely to cause above-average rainfall between December 2020 and February 2021 across **Indonesia**. Specifically, eastern parts of Kalimantan, Sulawesi, Maluku and Papua provinces are expected to bear the brunt of this, which will increase the possibility of flooding and landslides. However, negative impacts are expected in many other areas, including the densely populated islands of Java and Sumatra, where flooding and landslides in agricultural areas were reported in early 2021. Above-average rains are also likely to negatively affect rice and maize planting operations for the 2021 main season, while reduced sunshine and low temperatures may diminish yields. The inland and marine fisheries sectors, which support the livelihoods of many vulnerable rural populations, may also be affected due to reduced fishing opportunities and flooding in inland areas.

According to **the Philippines** Atmospheric, Geophysical and Astronomical Service Administration, above-average rains and cooler temperatures associated with La Niña are forecast to persist until March 2021 and affect eastern parts of the country, including the regions of Bicol, Mimaroma, Eastern Visayas and Eastern Mindanao. In addition, past La Niña events have been frequently correlated with a higher-than-normal number of cyclones and storms. This could negatively affect 2020 secondary season crops and result in a loss of stored crops, livestock, fishing gear or boats, aquaculture infrastructure and irrigation facilities. Such events can also damage housing and infrastructure (i.e. markets, processing centres and roads) and disrupt local livelihoods, compromising agriculture production and overall food security.

The impacts of La Niña on rainfall patterns vary across **Papua New Guinea**. In the past, La Niña has resulted in wetter conditions over most of the country, except in the

eastern islands of Milne Bay region. During La Niña years, there is an increased likelihood of floods, landslides and cyclones, with a potential to cause damage to home gardens and standing crops and trees, which are crucial to sustain about 85 percent of the population's livelihoods, with an increased risk of loss of human lives and infrastructure. The above-average rainfall conditions could exacerbate the recent outbreaks of fall armyworm and ASF, with increasing damage to crops and higher mortality rates in pigs.

The impact of La Niña varies across the **Pacific Islands**, where wet and dry weather conditions can coexist. Across the Pacific, sowing, growing and harvesting of key crops occurs on a rotational basis throughout the year and the fisheries sector is dominant. Historically, the Melanesian island group (Solomon Islands and Vanuatu) relies heavily on subsistence agriculture and can be significantly affected by the La Niña event, alongside Tonga, where there are also sizeable fisheries and agriculture industries. The potential of flooding and heavy rainfall combined with the South Pacific cyclone season can have various impacts on these islands, such as the pollution of water sources from saltwater intrusion, fisherfolk in danger at sea or the risk of loss of equipment, landslides and damage to aquaculture systems and crops for subsistence farms. In Kiribati, poor rainfall or drought conditions can contribute to the depletion of domestic water supplies or the intrusion of saltwater into water wells, with negative effects on aquaculture production and backyard agriculture. Local food security is also affected by the impact of the COVID-19 pandemic, which delayed exports and reduced remittances – an important source of income for many households in the Pacific Islands.

In the **Democratic People's Republic of Korea**, dry weather conditions induced by La Niña could affect the 2021 early season winter crops – wheat, barley and potatoes – to be harvested in June and July 2021. Although the early season harvest is relatively small, accounting for about 8 percent of the total annual cereal output, it is vital for food security during the lean season from May to September. As a result of the economic fallout from the COVID-19 pandemic, a significant proportion of the population faces stressed food supply situation.

Recommended anticipatory actions

For Southeast Asia, sowing for the 2021 main season in Indonesia, the 2020/21 main season in Timor-Leste and the 2020 secondary season in the Philippines generally begin in the fourth quarter of the year, and growing and harvesting take place in the first part of the year. In these countries, it is critical to support communities' efforts to mitigate the potential negative impact of above-average rainfall on crop development. In the Democratic People's Republic of Korea, vulnerable farmers should be supported to mitigate the effects of likely dry conditions ahead of planting the 2021 early season crops, starting in March 2021.

- Distribute waterproof silos for the safe storage of crop seeds, gardening and fishing tools, as well as food rations for communities potentially affected by wetter-than-normal conditions and who live in flood-prone areas. When possible, the silos should be paired with a spade to encourage families to keep them safe by burying them.
- Build or repair protection walls, gabions and riverbanks through cash-for-work programmes (via government social protection systems) to protect crops, aquaculture ponds, livestock and water sources.
- Establish evacuation routes for livestock and provide veterinary support to deter the spread of diseases, particularly ASF, at these sites.
- Enhance fall armyworm and ASF-related activities in affected areas.
- Explore options for social protection programme support to the most at-risk rural households.

For Papua New Guinea and high-risk countries in the Pacific Islands, the following actions can be considered.


For above-average rainfall:

- Ensure early warning systems reach fisherfolk and provide advice on safe and unsafe periods to fish.
- Identify safe havens to store fishing gear or agriculture tools, and identify drydocks to host boats.
- Provide cash (via government social protection systems) and facilitate support for the rapid reinforcement of structures or trees, or the evacuation of livestock.

For below-average rainfall:

- Encourage the use of water-saving irrigation materials and where possible, repair existing systems.
- Provide drought-tolerant early-maturing crop varieties, such as taro, cassava and kumara.





The FAO 2020–2021 La Niña Advisory was jointly produced by FAO’s Early Warning Early Action (EWEA), the Global Information and Early Warning System (GIEWS) and the Safeguards, Climate Risks and Bioeconomy Teams (OCB).

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