

Update on El Niño: Priority countries for July-December 2023

Global ENSO Analysis Cell | July 2023

The World Meteorological Organization (WMO) declared the onset of El Niño conditions in early July as a result of rapid and substantial changes in oceanic conditions observed in recent months. According to the latest predictions from the WMO Global Producing Centres of Long-Range Forecasts, there is a 90% probability of El Niño persisting during the second half of 2023. The following countries have been identified as high priority for potential humanitarian challenges through December:

Region / Country	JUL-SEP	OCT-DEC
Latin America		
El Salvador, Guatemala*, Honduras, Nicaragua,	DRY	DRY*
Colombia (N), Guyana, Peru (E), Suriname, Venezuela (N)	DRY	DRY
Asia-Pacific		
Indonesia, Timor-Leste, Viet Nam	DRY**	DRY
Myanmar, Papua New Guinea, Philippines,		DRY
Sri Lanka		WET
Pacific Islands***	WET/ DRY	WET/ DRY
East Africa		
Burundi, Ethiopia, Kenya, Somalia, South Sudan, Rwanda, Tanzania, Uganda		WET
Djibouti, Ethiopia (N,W), Eritrea, Kenya (SW), South Sudan, Sudan	DRY	

Forecasts less clear, but should be closely monitored; **Note that more significant impacts are expected to be observed from Oct; *Please refer to text below for more detail*

From October to December, confidence on forecasts is lower considering the longer lead time. Close monitoring of regional and national level forecasts, and consideration of anticipatory or early actions is recommended. In other regions, the historical weather shifts associated with El Niño occur later in the year, and this analysis will be updated as further seasonal forecasts become available, though seasonal forecasts should continue to be monitored in all regions. Other key regions to watch for later months include:

- **Southern Africa:** Risk of dry conditions during November-March.
- **Afghanistan:** Risk of wet conditions from January-April, and possibly earlier
- **Ecuador:** Risk of wet conditions from January-April, and possibly earlier
- **Caribbean:** Risk of wet conditions from November to April.

Status of ENSO forecasts

As of mid-June 2023, the sea surface temperatures and other oceanic indicators in the central-eastern tropical Pacific are consistent with El Niño conditions. WMO Global Producing Centres of Long-Range Forecasts and expert assessment suggest that there is a very high likelihood (90%) of El Niño prevailing through the second half of 2023.

The intensity of the event remains uncertain, but is expected to be of at least moderate strength. It is important to note that El Niño and La Niña are not the only factors that drive global and regional climate patterns, and that the magnitudes of ENSO indicators do not directly correspond to the magnitudes of their effects. At the regional level, seasonal outlooks assess the relative effects of both the ENSO state and other locally relevant climate drivers. Impacts - including on food insecurity health - can often peak well after the shift in rainfall itself.

Following the El Niño conditions and forecasts, the El Niño Southern Oscillation (ENSO) Global Analysis Cell¹, formed under the auspices of the Inter-Agency Standing Committee, convened to identify the countries at highest risk of humanitarian impact from this El Niño episode, during the coming six months. The analysis considers both the nearer-term seasonal outlook (July-September), and the longer horizon (October-December). It should be noted that greater uncertainty remains around the latter, and close monitoring is needed as additional seasonal forecasts become available. These countries were selected through a consultative process to identify those with the most concerning potential humanitarian impacts, based on a combined analysis of historical climatic shifts linked to El Niño; available seasonal climate forecasts; existing vulnerability to shocks; levels of coping capacity; agriculture production seasonality; and exacerbating drivers of humanitarian needs.

It is recommended that these countries closely monitor regional and national level forecasts in the coming weeks and months and consider potential anticipatory or early actions.

Central America and northern South America -

High-risk countries: Colombia (north), El Salvador, Guatemala, Guyana, Honduras, Nicaragua, Peru (east), Suriname, Venezuela (north)

El Niño is typically associated with below normal rainfall in Central America from July to December and in northern parts of South America from June to March. Latest seasonal forecasts also indicate that below-normal rainfall is expected through at least September in eastern parts of **Honduras, Nicaragua** and **Guatemala** (east coast of Central America); and in **Guyana, Suriname**, and northern parts of **Colombia, Venezuela** and east **Peru** (northern South America). Forecasts for the October-December period continue to show consistency for below-normal rainfall in north South America, but for Central America only some models suggest dry conditions to continue towards end of the year in some parts. For El Salvador, the latest forecasts do not show a clear signal for below-average rains, nevertheless given ongoing

¹ Participants from ACAPS, FAO, IFRC, IOM, IRI, MSF, OCHA, SCI, UNHCR, UNICEF, WFP, WHO, WMO

drought concerns and underlying vulnerabilities, the risk of reversion to the historical El Niño impact of dry conditions remains serious.

In **Central America**, planting of the 2023 main “primera” maize crop, for harvest from August, finalized in June amid generally dry conditions may worsen the already-reduced water supply situation. The area planted is estimated to be 50% below-average in some countries. For instance, in El Salvador planting of main season crops was delayed by one month and progressed at a slow pace, with current estimates indicating below-average areas planted for maize, an important staple crop. In June 2023, prices of beans were more than 25% higher than the already-elevated levels of 2022 and prices could increase further, if dry weather conditions continue, constraining food access for vulnerable households. Similarly, in Honduras, if forecasts for persistent dryness materialize, this is expected to have adverse effects on yields of the 2023 maize and beans, pushing domestic prices to very high levels. In **South America**, staple crop production may also be affected in Venezuela, although the impact is expected to be less severe to the 2023 main paddy crop, as the harvest was completed in May. As for coffee, an economically important agricultural product in the region, drier-than-average conditions during the critical May-October growing period in Central America, as well as Venezuela and Colombia, could have a negative impact. Production of various other items may also be disrupted in Colombia (coffee, livestock); El Salvador (coffee, sugarcane); Honduras (coffee, bananas); and Venezuela (rice, coffee). In Guyana, Suriname and northern Peru, dry conditions would be expected to have more limited impacts on national-level food insecurity but could cause important localized food security concerns.

These countries are also likely to face an increase in **health needs**. These include rising malnutrition due to reduced agricultural yields; a higher risk of dengue between July and September, as dry conditions may increase aedes breeding sites through peri-domestic water storage and higher temperatures reduce the extrinsic incubation period of the virus; increased risk of respiratory illness; and increased risk of heat stress. This could also lead to acute water shortages and weaken the capacity of households to deal with increased water prices, compounding humanitarian needs. El Niño is also associated with warmer temperatures throughout Central America and northern South America, increasing the likelihood of heatwaves in the region. People with chronic diseases that take daily medications have a greater risk of complications and death during a heatwave, as do older people and children.

Other parts of central America and the Caribbean will also be at risk of lower-than-average rainfall, but are considered less likely to prompt international humanitarian response. These include **Costa Rica, Panama, and Trinidad and Tobago**.

El Niño is typically associated with stronger hurricane activity in the eastern Pacific basin, and reduced activity in the Atlantic basin. According to NOAA’s May outlook (to be updated in August), there is a 40% chance of a near-normal season in the Atlantic this year. Regardless of

the number of storms predicted for this season, it is important to note that serious impacts can happen even with a small number of hurricanes in the Caribbean and Central America.

As current forecasts suggest that the current El Niño event could extend into early 2024, attention should also be given to areas that historically have faced shifts during this period - notably the risk of wet conditions in **Ecuador** and parts of the **Caribbean**. For the latter, monitoring dry conditions in the coming months remains important given ongoing drought conditions in some areas, though this is not linked closely to historical El Niño shifts.

Southeast Asia - Below-normal rainfall:

High-risk countries: Indonesia, Myanmar, Papua New-Guinea, Philippines, Timor-Leste, Vietnam

Analysis of previous El Niño impacts suggests that parts of Southeast Asia experience below-normal rainfall between June-January. The latest seasonal forecasts indicate that this pattern is likely to happen, especially over southern and western **Indonesia** and **Timor-Leste**. These two countries are also influenced by the Indian Ocean Dipole (IOD). According to the Australian Bureau of Meteorology, the IOD is currently neutral. However, a positive IOD is likely to develop in the coming months. A positive IOD typically suppresses austral winter and spring rainfall over much of the Indo-Pacific, and if it coincides with El Niño, it can exacerbate El Niño's drying effect. It is important to note that both Indonesia and Timor-Leste are currently in their dry season, so minimal rainfall is expected at this time of the year. What needs to be watched carefully is the potentially extreme dry period coupled with a poor rainy season which will begin from October onwards, when planting of the 2024 main crops is expected to start. **Papua New Guinea** is also expected to experience drier-than-normal conditions from October-December onwards, but like Timor-Leste and Indonesia is currently in its dry season. A clearer understanding of what might develop in the country is likely to come during the rainy season at the end of the year.

In other areas forecasts indicate drier-than-normal conditions starting from October-December, including **Vietnam** and the **Philippines**. Such countries are important to watch from August/September onward to understand the progression of their respective rainy seasons. In **Myanmar**, forecasts are less clear, but given compounding factors, including high prices and shortages of agricultural inputs, a small shock could have a significant impact. If the 2023 cereal production declines, it will mark two consecutive years of below-average outputs, and is expected to exacerbate domestic food price spikes registered since early 2022. For example, domestic prices of "Emata" rice, a widely consumed quality, were at record highs in June 2023, nearly 120 percent higher than the elevated levels a year earlier. There are also increased chances of above-normal temperatures, which could have additional impact on agricultural production as well as health and WASH impacts associated with extreme heat and drought.

In **Indonesia**, the 2023 main crops were harvested by mid-June and the output is expected at an above-average level. However, concerns exist for the 2023 secondary crops, as planting takes

place in June/August and early development of the 2023 secondary crops, may be impacted. In addition, dry conditions could increase levels of water stress for palm oil trees, negatively affecting flowering and fruit formation. If the forecast for dry weather materialize, the full effect on production is expected to manifest next year, as palm oil yields typically decline 4-12 months after a stress event occurs. Indonesia is a major palm oil exporter, accounting for about 40-50% of global trade, and a decrease in domestic production could have significant implications on international prices of palm oil. This is of particular concern, as **Malaysia**, the second largest palm oil exporter, may experience below-average rainfall amounts and elevated temperatures between August and December in the southern parts of Peninsular Malaysia and in most areas of Sabah and Sarawak state, which combined contribute to about 80% of the country's annual palm oil output.

Similarly, in **Timor Leste**, the 2023 main season cereal output, estimated at above-average levels, was already harvested, but the secondary season crops are expected to be at the critical flowering and grain filling stages of development, leading to a decline in production. If output decreases, the country will need more imports to cover domestic needs. In the Philippines, the dry weather condition will coincide with critical growing stages of the main season rice crop, and could have negative effects on yields - particularly for the breadbasket regions of Mindanao and Luzon.

While not considered as high a priority for humanitarian planning, close monitoring should continue for other parts of the region. This includes **Cambodia**, where the projected shift to dry conditions later in the year falls outside the main rainfall season but where there is concern with a possible later onset of the monsoon season; **Vietnam**, which has relatively high coping capacity but which has been strongly affected in the past; and **Lao PDR** where there is not currently a signal for dry conditions, but where macroeconomic stress would be a compounding factor.

In these countries, there is also a higher risk of **dengue and other arboviruses** (chikungunya and Zika) between July and September (dry conditions may increase *Aedes* breeding sites through increased peri-domestic water storage and higher temperatures reduce the viruses' extrinsic latent period). El Niño is also associated with warmer temperatures throughout the region, increasing the likelihood of heatwaves. People with chronic diseases that take daily medications have a greater risk of complications and death during a heatwave, as do older people and children. The risk of wildfires also increases in hot, extremely dry conditions, such as drought, and during high winds. While these fires can harm and kill those in the proximity, smoke from wildfires can cause a range of health issues, including respiratory and cardiovascular problems. During both the 1997-1998 and 2015-2016 El Niño events, wildfires were exacerbated in Indonesia and Malaysia, causing major air quality issues in the entire region during the second half of 1997 and 2015.

South and Central Asia

High-risk countries: Sri Lanka

From October to December, El Niño is also associated with higher levels of rainfall in parts of Sri Lanka and the southern portion of India. While forecasts at this range still have significant uncertainty, they do indicate 40-50% chance of rainfall in southwestern areas during this period. Although abundant rains are generally favorable for crop development, the combination with the elevated temperatures for the forecast period, may cause pest infestations, resulting in localized crop losses. It should also be noted some models suggest dry conditions for the northwest, mainly during October, a risk which should also be monitored given importance of agriculture.

Afghanistan should also be monitored, as El Niño is typically associated with higher than normal rain from January. Latest forecasts also indicate a 50-60% change of above-normal rainfall from October-December. This will be important to watch after three years of drought which can compound soil and lead to flash flooding (as the soil cannot absorb the water like normal). However, higher rain could also have positive effects in supporting farmers and boosting production.

Pacific Islands

For the **Pacific islands**, El Niño is associated during most of the year with higher-than-normal rainfall in some areas, and lower-than-normal rainfall in others. Latest seasonal forecasts also indicate a risk of dry conditions during July-September in, for example, the **Marshall Islands** and **Samoa**; and from October-December in **Palau, Samoa, Tonga, and Vanuatu**

Meanwhile **Nauru** and parts of **Kiribati** – which usually see wetter-than-normal conditions under El Niño – are also forecast to receive above average rainfall through the end of the year; and **Tuvalu** shows likely wetter-than-normal conditions from October-December. This could provide positive impacts as Kiribati and Tuvalu in particular have been facing three years of drought. El Niño is also associated with higher tropical cyclone activity in the Central Pacific basin, with NOAA predicting 50% chance of above-normal tropical cyclone activity during the central Pacific hurricane season.

In the Pacific islands, the sowing, growing and harvesting of key crops occurs on a rotation basis throughout the year. With wet conditions, flooding could result in localised crop and food stock losses and damage infrastructure, including housing, roads and schools. Heavy rainfall and flooding can damage water sources and sanitation facilities, carry runoff and waste into streams and lakes, and contaminate the water supply, leading to increased risk of water-borne diseases. However, it should be noted that for both Kiribati and Tuvalu, dry conditions have been a particular concern, so above-average rainfall could also bring positive impacts on agriculture. Both are also highly reliant on imports, potentially muting the effects of impacts on production.

East Africa / Greater Horn of Africa:

High risk (wet conditions Oct-Dec): Burundi, Ethiopia (south), Kenya, Somalia, South Sudan, Rwanda, Tanzania, Uganda

High risk (dry conditions Jul-Sep): Djibouti, Ethiopia (N,W), Eritrea, Kenya (SW), South Sudan, Sudan

In much of East Africa, El Niño is associated with higher-than-normal rainfall, and attendant risk of flooding, starting from around October. Current seasonal forecasts - while still more uncertain at this stage - do indicate this shift is likely in southern **Ethiopia, Kenya** and **Somalia**, as well as to a slightly lesser extent in **Burundi, Rwanda**, and **Uganda**. **South Sudan** is also particularly vulnerable to flooding from high rainfall in the Lake Victoria Basin. The Indian Ocean Dipole (IOD) - currently in neutral state, is expected to shift to positive in the coming months, reinforcing the risk of higher rainfall. Latest seasonal forecasts will be inclusive of both ENSO and IOD influence.

If these forecasts materialize, yields of secondary 2023 season “Deyr” crops in **Somalia**, of “short rains” crops in bimodal areas of eastern **Kenya** and to a lesser extent the second season harvest in **Uganda**, the “Vuli” harvest in northeastern **Tanzania** and the “2024 B” harvests in **Burundi** and **Rwanda**, all gathered in early 2024, will be boosted, resulting in above-average cereal production, despite likely substantial but localized flood-related losses. In **Tanzania**, in addition, above average rains in late 2023 would benefit planting and germination of major “Msimu” crops, planted in October and November and harvested from May 2024 in central and southern unimodal rainfall areas. Abundant October-December rains will also boost the recovery from an exceptionally prolonged, widespread and intense drought between 2020 and early 2023 drought in pastoral areas of southern **Ethiopia**, central and northeastern **Somalia** and northern and eastern **Kenya**.

However, livestock and agricultural losses have to be expected in flood-affected areas due to drowning and waterborne diseases, while a full recovery from the massive livelihood losses caused by the drought in **Ethiopia, Kenya and Somalia** will necessitate several good rainy seasons. Heavy October-December rains will likely also have a negative knock-on, exacerbating impact on the flood situation in **South Sudan**. Heavy rains over the Lake Victoria basin will result in rising levels of the lake, which are already higher than average due to above-average precipitation received in the first half of 2023. These high levels will increase the levels of the White Nile, that flows from the lake Victoria through Uganda and through South Sudan, where it crosses the Greater Upper Nile region, heightening the risk of a fifth consecutive year of exceptionally widespread floods due to the overflow of the river and of an expansion of permanently flooded areas in an area of the country characterized by the highest cereal production deficit and by the highest prevalence and severity of acute food insecurity.

Those countries will also face an increased risk of some climate-sensitive diseases. East Africa is already facing one of the worst cholera outbreaks in years and one of the longest ever recorded in the region. Heavy rainfall and flooding, often leading to increased water contamination, will likely exacerbate and further prolong this outbreak in many countries. Flooding will also provide ideal conditions for mosquito multiplication and the emergence and/or exacerbation of Rift Valley fever and malaria later on in 2023.

Meanwhile, northern unimodal rainfall areas of the East Africa region are expected to face below average rainfall during July-September, including key growing areas of western **Ethiopia**, **Eritrea**, **Sudan**, and central and northern **South Sudan**. 2023 crops, for harvest from September-October, have been planted in June. In major growing areas of southwestern **Kenya**, the 2023 “long-rains” main season crops, for harvest from October, have been planted in March. Forecasts point to below-normal rainfall amounts for the June-September rainy season, which is crucial for these areas, where it contributes more than 50% of the annual total rainfall and drives the main harvests. In Kenya, the 2023 “long-rains” main season crops benefited from average to above-average rainfall amounts between March and June, while in northern areas, the June -September rainy season had a timely onset, with above-average rains received in June. However, dry conditions prevailing in July across the subregion are likely to limit overall rainfall for the season. **Sudan** is particularly concerning, where the ongoing conflict is causing soaring prices and shortages of key inputs, including fuel, seeds, agrochemicals and labour and is likely to have significantly constrained planted areas. This, coupled with the expected weather-related yield declines, is expected to result in a significant decrease in cereal production. Below-average rains are also expected to negatively affect pasture and water availability for livestock.

Spillover price/economic effects

Beyond the direct country-level impacts mentioned above, the effects of an El Niño event on agricultural production could also impact broader trends in food prices, inflation and economic performance. For example, the potential impact on rice production in Asia - combined with an extension of restrictions on Indian exports of rice - could lead to steep price rises in the region and possibly beyond. Beyond domestic impacts from reduced production, this could impact large rice importers in Asia (e.g. Afghanistan, Nepal) and possibly beyond (e.g. Yemen, Somalia). Overall, international rice prices have been on a steady increase since mid-2022. Likewise, the El Niño event is anticipated to disrupt food production in Central America's Dry Corridor and northern South America, which could have adverse effects on both economic performance and broader food security and commodity prices in the region.

Looking ahead – Regions to monitor

Southern Africa: El Niño is associated with dryer-than-normal conditions starting around November. Indications of below-normal rainfall during have started emerging in current seasonal forecasts for some parts of southern Africa, but these remain a long way out and could

evolve significantly. Countries that might be of particular concern due to underlying vulnerabilities include **Madagascar, Malawi, Mozambique, and Zimbabwe**, though other countries would also likely feel significant food security impacts. There would also be significant risk of spillover price impacts if production in South Africa were significantly affected. It should be noted that this outlook will also be significantly impacted by other factors besides El Niño, most notably the Indian Ocean Dipole which historically has also been predictive of rainfall patterns in the region. While currently in a neutral state, a positive IOD is likely to develop later in the year, reinforcing the risk of below-average rainfall. As always, the latest comprehensive seasonal forecasts - which are inclusive of all relevant modes of climate variability including ENSO and IOD states - should be closely monitored. El Niño being also associated with warmer temperatures throughout the region, heatwaves will be to monitor more closely during the austral summer period.

- **Caribbean:** Above-normal rainfall from November to April, particularly in the central, northern and western Caribbean.
- **South America:** Above-normal rainfall in various locations of central and southern South America between September-May, particularly around coastal areas.
- **Central Asia:** Above-normal rainfall from January to April, particularly in the Hindu Kush mountains and surrounding regions.

Resources:

- For further information on the **current El Niño and seasonal forecasts**, please see the latest [WMO Global Seasonal Climate Update](#); [WMO ENSO Update](#); [IRI ENSO forecasts](#); and [IRI seasonal forecasts](#). For further analysis on the forecast for specific countries, the relevant National Meteorological Service or regional climate centre can be consulted.
- For further information on **agricultural impacts and anticipatory actions** to consider, please see the latest [update from FAO GIEWS](#).
- For further examples of **early and anticipatory actions to consider across a range of sectors** please refer to the [IASC SOPs for Anticipatory Action to El Niño/La Niña Episodes](#) (particularly Annex 1 - Page 22)
- The respective FAO Country and Regional Offices can be contacted in case of queries on the agricultural impacts of above or below average rainfall.
- In line with its regular support, the respective OCHA Country or Regional Office is available to discuss potential readiness planning.

- For further information on past La Niña impacts on agriculture and food security, please see: <https://www.fao.org/giews/reports/el-ninola-nina-collection/en/>
- For further information on health impacts during heatwaves, please refer to https://www.who.int/health-topics/heatwaves#tab=tab_1

Background on the analytical process

The list of high-risk countries is neither fixed nor final. It is the result of a ‘high level’ global analysis and should be verified against more detailed national forecasts and more nuanced understandings of risk and vulnerability at national level. The countries included in the high-risk list are not the only countries globally that need to be concerned about an El Niño event. Rather, they are those that, based on a number of factors outlined in the section below, should be prioritized for further analysis and early or anticipatory action. As the global ENSO outlook and regional/national forecasts develop, the analysis of at-risk countries will be updated and communicated accordingly.

It should be noted that El Niño and La Niña are not the only factors that drive global climate patterns. At the regional level, seasonal outlooks should be closely consulted as they are designed to assess the relative effects of both the El Niño and La Niña development and interaction with other locally relevant climate drivers (for example, the Indian Ocean Dipole and impacts in east Africa). Regionally and locally applicable information is available via regional and national seasonal climate outlooks.

The following steps were taken to identify countries at high risk of El Niño impact during the May – August 2023 period, based on a process of declassification:

1. The IRI El Niño and Rainfall map² was used to list the countries historically impacted by El Niño and outline when El Niño historically shifts rainfall patterns in those countries (months) and how (dry/wet). Countries that are not historically affected by El Niño were not considered. Countries where the historical El Niño shift is outside the current focus period were also left off for now.
2. Seasonal forecasts for the July-September and October-December periods were applied as a filter, with countries facing normal or near-normal forecasts and no signal removed from the list. The main source used for this was the WMO Global Seasonal Climate Update, complemented by IRI Seasonal Climate forecast. The seasonal climate outlooks produced by some Regional Climate Outlook Forums (RCOFs) were also taken into consideration.
3. Countries considered to have ‘very low’ and ‘low’ vulnerability (3.2 and below) and ‘very low’ and ‘low’ lack of coping capacity (4.6 and below), according to the INFORM index thresholds, were removed. Cases where only one of the thresholds was passed were flagged for further discussion.

² https://iri.columbia.edu/wp-content/uploads/2016/05/ElNino_Rainfall.pdf

5. Agricultural seasonality was analysed to determine what stage of crop growth will potentially be affected during the outlook period and potential impact. Countries where no impact on agricultural production or favourable impact was forecasted were removed from the list, except where there was a risk of above-average rainfall.

6. Additional aggravating factors, including health, security and macro-economic constraints were also looked at and used as a filter to further determine levels of vulnerability to additional shocks.

7. Finally, judgement was used in particular cases when a country fell outside the determined parameters but was in a situation of particularly high vulnerability.