

## Chapter 5. Focus and perspectives

*Building on the CropWatch analyses presented in chapters 1 through 4, this chapter presents first early outlook of crop production for 2021 (section 5.1), as well as sections on recent disaster events (section 5.2), and an update on El Niño or La Niña (section 5.3).*

### 5.1 CropWatch food production estimates

The production outlook for the current bulletin includes only the major producers in the Equatorial region, the Southern Hemisphere, and some isolated Northern Hemisphere countries where crop development is sufficiently advanced to ensure that estimates are reliable. Detailed production estimates for Brazilian States and Argentinian Provinces are listed in Annex B.

CropWatch production estimates differ from most other global estimates by the use of geophysical data in addition to statistical and other reference information such as detailed crop distribution maps. Recent sub-national statistics are used for the calibration of remote-sensing-based models. It is also stressed that the assessments and underlying data are crop-specific, i.e. based on different crop masks for each crop and that, for each crop listed in Table 5.1, both yield variation and cultivated area variation are taken into account when deriving the production estimates.

**Table 5.1 Preliminary 2021 production estimates in thousands tonnes for selected countries in Equatorial region, and Southern Hemisphere as well as early crops in the Northern Hemisphere.  $\Delta\%$  stands for the change in % compared with the corresponding season in 2020.**

	Maize		Rice		Wheat		Soybean	
	2021	$\Delta\%$	2021	$\Delta\%$	2021	$\Delta\%$	2021	$\Delta\%$
<b>Africa</b>								
Angola	2574	-13	45	-2				
Egypt					12015	0		
Ethiopia	6693	-3			3564	-3		
Kenya	2704	-6						
Morocco					5963	-5		
Mozambique	1727	-15	376	-2				
Nigeria	9924	-2	4206	0				
South Africa	13245	13						
Zambia	2114	7			89	3		
<b>Asia</b>								
Bangladesh	2246	-6	43163	-6				
Cambodia			9699	-4				
India					87042	-9		
Indonesia	17033	2	66754	3				
Myanmar			24261	-5				
Pakistan					26819	-2		

	Maize		Rice		Wheat		Soybean	
	2021	Δ%	2021	Δ%	2021	Δ%	2021	Δ%
Philippines			20956	1				
Sri Lanka			2524	0				
Thailand			41723	3				
Vietnam			47442	1				
<b>America</b>								
Argentina	47992	-11	1883	-3			45736	-13
Brazil	82074	-6	11737	1			94552	-6
Mexico	22922	-4			3430	-20		

A specific section on environmental conditions that prevailed among the major importers and exporters between October 2020 and January 2021 is provided in Chapter 3.1.

### **Maize**

Table 5.1 lists the results of the maize production prediction for seven countries in Africa, two countries in Southeast Asia and three countries in the America, including the 2nd and 3rd largest exporters - Brazil and Argentina. CropWatch predicts that maize production in Argentina and Brazil will drop by 11% and 6% from 2020, respectively, mainly constrained by the drier and warmer weather since the start of the summer season. Water deficits in the major maize producing provinces resulted in a reduction of the production. Drought conditions also occurred in Mexico since the start of the maize season in September 2020. This caused a drop in the area planted and hampered the development of maize, resulting in a 4% YoY drop in maize production. Of the 7 maize producing countries in Africa being monitored, only Zambia and South Africa showed increases in maize production, which were up by 7% and 13% respectively. Favorable rainfall benefited the sowing and early development of the maize in the two countries. Remote sensing-based monitoring revealed that both sown area and yield prospects are above the 5YA. In Angola, Ethiopia, Kenya, Northern Mozambique, and Nigeria lower production as compared to 2020 is expected. Desert Locusts in Ethiopia and Kenya also damaged maize plants and production to some extent and the maize productions dropped by 3% and 6%, respectively. Lower maize production is also forecast in Bangladesh mainly due to the reduced yield and sown area. While in Indonesia, maize production increases by 2% thanks to the 2% expansion of maize cultivation.

### **Rice**

This current production prediction covers 13 rice-producing countries, including most of the key producing countries in Southeast Asia. Among the major rice producers, rice production is forecast to drop from 2020 levels in Bangladesh, Cambodia, and Myanmar by 6%, 4% and 5%. Both reduced yield and sown area resulted in the drop in production in the three countries. Rice production in the other Southeast Asian countries is expected to be at or slightly above that of 2020. Rice production of Mozambique and Angola decreased by 2% as affected by the low rainfall. Rice output in Argentina decreased by 3% while it increased by 1% in Brazil. The combined output from the 13 countries monitored is expected to drop by 0.3%, which will have a limited impact on the global rice market.

## **Wheat**

The harvest of wheat in Southern Hemisphere including Argentina, Australia, Brazil and South Africa concluded by the end of 2020. This bulletin focuses on the wheat producers in tropical and sub-tropical regions including Egypt, Ethiopia, Morocco, India, Pakistan, and Mexico. Among these countries, wheat production in Mexico is forecast to drop by 20% as affected by the lack of water. Large negative departures of rainfall in major wheat producing region in India, the Gangetic plains, resulted in an 8% drop of wheat planted area which leads to a 9% reduction of wheat production. However, considering that the region is almost fully irrigated, the magnitude of the rainfall deficit might narrow when the crop progresses. Morocco also suffered from water deficit, resulting in 5.4% drop of wheat production. Wheat production in Egypt remains the same as in 2020. A slight drop in Ethiopia and Pakistan, by 3% and 2% respectively, is forecast. Mexico and Morocco are among the world's top wheat importers. The drop in domestic wheat production might result in increased wheat imports. The same applies to South Africa. The country used to be an exporter of the same importance as Australia, but over the past two decades, South-African farmers have reduced production to grow other, more profitable crops, to the extent that South Africa is now a net importer of about 1.5 million tonnes. The estimated production increase will allow the country to compensate, albeit in a limited way, for the reduced output of maize.

## **Soybean**

Brazil and Argentina are among the top 3 exporters of the commodity. For both countries, decreased soybean production is forecast by CropWatch. In Argentina, drier weather dominated in the major soybean producing states including Cordoba, Santa Fe and Buenos Aires, resulting in an 11% drop of soybean yield and a 13% drop of soybean production. Similarly, drought in central Brazil also resulted in lower soybean yields as compared to 2020. The soybean production in Brazil is forecast at 94,552 thousand tons, down by 6% from 2020.

## **5.2 Disaster events**

### **Introduction**

Natural hazards regularly impact heavily on agriculture and hamper the eradication of hunger and the achievement of sustainable development. The number of climate-induced disasters has increased significantly over the last decade. Out of all natural hazards, floods, droughts and tropical storms have the biggest impact on the agricultural sector. In developing countries, the agricultural sector absorbs about 22 percent of the total damage and losses caused by natural hazards, as estimated in the recent FAO report on the impact of disasters on agriculture and food security.

2020 secured the rank of second warmest year on record since 1880. The global sea and land surface temperature has increased by 0.98°C over the last 141 years. Even more alarmingly, the world's seven-warmest years have all occurred since 2014. The global tropical cyclones tied the record of 108, set in 2018. They killed people, caused floods, landslides and damaged crops in Central America and the USA. The Philippines, together with Vietnam were the countries that were the hardest hit in South-East Asia.

The COVID-19 pandemic has worsened food insecurity for the most vulnerable people, especially those living in urban areas. As this report shows, the world's food production is ample. However, lingering supply disruptions due to COVID-19 related social distancing measures have caused a high food price inflation, which in combination with reduced income, forces many people to go hungry. The number of acutely food insecure people has risen from 149 million in 2019 to 272 million by the end of 2020.

In the current CropWatch bulletin, the main disasters that threaten both global health and food security are briefly discussed.

### **COVID-19**

By end of January 2021, the number of confirmed cases of COVID-19 exceeded 100 Million and the global death reached 2.4 million. However, with the availability of several vaccines that are already authorized and recommended by national and world health organizations, millions of citizens around the world started to receive vaccines. This is expected to help in the transition toward normalcy when COVID-19 mortality and infection rate starts to fall.

Not only the public health sector was threatened by the COVID-19 pandemic, but also other sectors such as the economy, education, and agriculture were severely impacted. The agricultural industry has been negatively affected by the pandemic on a large scale. The pandemic brought about unemployment, restriction to product export and import, lower rates of production, loss of income, wastage, and uncertainty of the future regarding agricultural business strategies.

To mitigate the negative impacts of COVID-19 on agriculture, several governments passed COVID relief packages to support agriculture production. As an example, the United States Congress has recently passed a \$900 billion relief package out of which \$13 billion were allocated to agricultural programs, representing approximately 1.4% of total spending in the bill.

### **Storms & Hurricane**

Super Typhoon Goni that hit the Philippines in October and November 2020 affected two million people. It was the “strongest land-falling tropical cyclone on record” in the Philippines. At least 20 people were killed and 400,000 people were displaced when Typhoon Goni made landfall on three separate occasions across the Philippines in early November (Figure 5.2). Shortly before Typhoon Goni, on Oct. 25, Typhoon Molave made five landfalls over the Philippines’ largest island, Luzon, as the equivalent of a strong tropical storm. Typhoon Molave affected nearly a million people, caused at least 22 deaths and 39 injuries.

Molave was also the fourth storm to hit Vietnam in October – a month that saw 230 people killed in storm-related flooding and landslides. These storms also left hundreds of thousands of people in a critical situation as crops were washed away.

Another strong typhoon called Vamco hit the Philippines and Vietnam on Nov. 11. The storm killed 73 people and injured 82 while affecting over 4 million people in many of the same regions of the Philippines. While in Vietnam, 243 people were killed as a result of both typhoon and flooding that directly affected 1.5 million people and caused damage to 600,000 houses. The loss in agriculture was estimated at \$200 million in the Philippines due to Typhoon Vamco.



**Figure 5.1 Residents of Barangay Baybay in Malinao, Albay, rummage through what was left of their destroyed homes, a week after Typhoon Goni destroyed most of their village (source: <https://news.un.org/en/story/2020/11/1077142>).**

Over Mexico, Central America, and the United States, a set of hurricanes and strong storms hit the region over the period from October to the end of January 2021. Due to the strong Hurricane "Marie" that occurred in October, more than 623,000 people were affected in Mexico and the United States. By end of October in the United States, Hurricane Zeta was responsible for the mandatory evacuations of approximately 27,000 persons in Louisiana. By early November, Hurricane Eta became a major hurricane in Central America. In Honduras, Tropical Storm Eta affected 2,848,091 residents and caused the evacuation of 101,312 people and millions of losses in crops had been sustained, in addition to the destruction in the infrastructure. The Sula Valley Region had been the most affected in Honduras (Figure 5.3). Besides, according to the country's Ministry of Agriculture and Livestock, 8,200 hectares of maize and 12,850 hectares of beans were lost in Atlántida, Colón, Comayagua, Copán, El Paraíso, Francisco Morazán, Intibucá, Lempira, Olancho, and Yoro departments as of November 12th.



**Figure 5.2 The flooded area due to the heavy rains caused by Hurricane Eta, now degraded to a tropical storm, in Machaca village Puerto Barrios, Izabal 277 km north Guatemala City on November 5, 2020. (Source: <https://ticotimes.net/2020/11/06/central-america-evaluates-the-destruction-caused-by-cyclone-eta> , Photo by Carlos ALONZO / AFP)**

Over Guatemala, heavy rain and landslides caused by Hurricane Eta affected 81,000 persons and caused the evacuation of 4,625 people. The Ministry of Agriculture, Livestock and Food estimates 120,000 hectares of land had been affected by Hurricane Eta as of November 17th with Santa Rosa (southeast) and Alta Verapaz (central north) departments having the largest affected areas

in Guatemala. Over Cuba and the United States, heavy rains caused by Tropical Storm Eta affected a total of 240,103 people, of which 14,322 were injured. Also, 60,787 people were evacuated from their homes and 7,125 had been housed in 86 shelters. In Mid-November, Hurricane Iota damaged 98% of the infrastructure on the island of Providencia, Colombia that has approximately 5,000 residents. In Nicaragua, media reported that 16 people died due to Hurricane Iota and much of the region had no source of electricity or clean water. Besides, around 40,000 people were evacuated and housed in shelters where shortages of food and water were reported.

While in Panama, media reported more than 400 families were affected by floods in the communities of Sambù and Puerto Indio in Darién where Hurricane Iota caused heavy rains since 14 November. On 18 November 2020, in El Salvador, media reported that 700 people residing in high-risk and vulnerable areas of the region have been evacuated as a preventative measure. On 22 November 2020, 383,613 people were affected by Hurricane Iota in Guatemala, where 27,158 people were evacuated and 7,268 have been sheltered in centers that comply with the hygiene standards established in response to COVID-19. Additionally, 4,847 homes were damaged, and 164,000 hectares were affected by Hurricane Iota. In Honduras, media reported that over 100,000 people were affected by Hurricane Iota and 16 people have died by end of November.

### ***Drought & Wildfire***

The Paraguay River had reached its lowest level in half a century after months of extreme drought in the region, exposing the vulnerability of landlocked Paraguay's economy. Some 85% percent of Paraguay's foreign trade is conducted via the river, which has been depleted because of a lack of rainfall in the Pantanal area of Mato Grosso state in Brazil (Figure 5.4), where the river originates. The fall in the water levels has slowed down cargo vessel traffic on the Paraguay River, causing significant cost overruns for the transport of fuel, fertilizer, food, and other imported goods. The crisis has also exposed the vulnerability of Paraguay's access to drinking water.



**Figure 5.3 (left) Cracked earth is exposed in the riverbed of the Paraguay River in Chaco-i near Asuncion city, Paraguay, Thursday, Oct. 8, 2020. (AP Photo/Jorge Saenz). (Right) The bottom of the Paraguay River emerges from the water amid historically low water levels near the Remando bridge in Mariano Roque Alonso, Paraguay, Wednesday, Oct. 7, 2020. (AP Photo/Jorge Saenz).**

Following months of extreme drought in Paraguay, the country had to declare a national emergency due to large fires fueled by strong winds and high temperatures.

In Brazil, 2020 was the second-most devastating year for the Brazilian Amazon. As reported by Brazilian space agency INPE, a total area of 8,426 square kilometers of the Amazon rainforest was lost due to deforestation in 2020 (Figure 5.5). The destruction in Brazil, the world's biggest exporter of beef and soybeans, is being driven largely by farmers, ranchers, and land speculators bulldozing trees and burning them to make way for crops and pasture.



Figure 5.4 2020 was a devastating year for the Brazilian Amazon (source: <https://phys.org/news/2021-01-grim-year-brazilian-amazon.html>).

On October 17th, wildfires burned 3,000 acres of land in Jamestown, Colorado, United States. Besides, 500 homes, 750 buildings, and power lines reported as threatened by the fire and mandatory evacuations were in effect for 1,000 people (Figure 5.6). In California, a wildfire that occurred in October and January burned 6,777 acres of land, threatened 54,600 homes, and caused the evacuation of 61,555 people.



Figure 5.5 The CalWood fire, northwest of Boulder sends up a large plume of smoke seen from Highway 93 on Saturday, Oct. 17, 2020. Source: <https://www.denverpost.com/2020/10/17/jamestown-evacuated-calwood-fire/>

### **Floods**

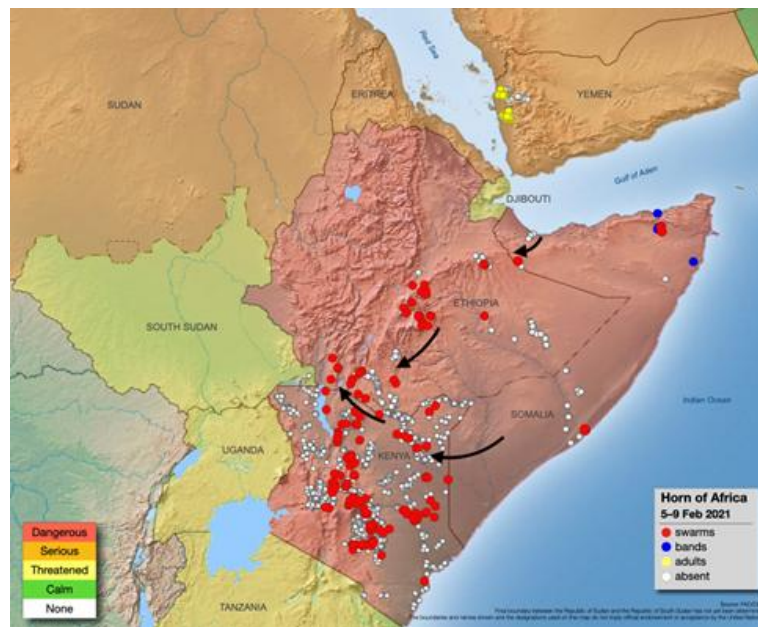
Heavy rains that occurred during October and November caused the overflow of twelve rivers in Venezuela and affected over 30,000 people, particularly in Zulia State. Also, during the period (October-January), the heavy rains caused floods and landslides in vast regions in Guatemala leading to the evacuation of hundreds of people. In Colombia, over the period (October-December), the heavy rains caused the overflow of many rivers that affected over 35,000 people and 8,198 families and caused the death of two people. The severe weather heavy rain, floods, and landslides caused 6 road closures and affected crops. In El Salvador, The heavy rains that occurred in October 2020 caused landslides and affected a total of 110 families and 9 deaths were reported, in addition to the destruction of infrastructure. In Mexico, media on 24

November 2020 reported that over 150,000 people have been impacted by severe weather and flooding of the Usumacinta River, Mexico's largest tributary river.

In the Dominican Republic, about 7,285 people have been evacuated due to severe weather in November. While in Honduras, over 289,730 people and 53,515 homes have been affected by heavy rains and severe weather caused by tropical cyclones Eta and Iota that have occurred in November. In Bolivia, a total of 15,593 families, 873 homes, and 7,438 hectares of agricultural land were affected due to the severe rain that occurred in January 2021. Also, media reports indicated that 80% of the town of Guanay was covered by more than one meter of floodwater.

### **Desert Locust**

Numerous immature swarms continued to migrate in the horn of Africa during January 2020. The swarms continued to migrate from previous breeding areas in eastern Ethiopia and central Somalia to southern Ethiopia and Kenya. A few swarms moved to northeast Ethiopia and continued to Eritrea, while a swarm was seen in northeast Tanzania. The control operations during January treated nearly 316,414 ha compared to 336,900 ha in December (Figure 5.7).



**Figure 5.6** FAO desert locust bulletin, the current situation during February 2021.

Source:<http://www.fao.org/ag/locusts/common/ecg/75/en/210216DLupdate.jpg>

It is expected that the invasion will decline due to the intensive control operations in the upcoming weeks. However, with more rains fall in northern Kenya during the upcoming raining season in March, the swarms are expected to quickly mature and lay eggs.

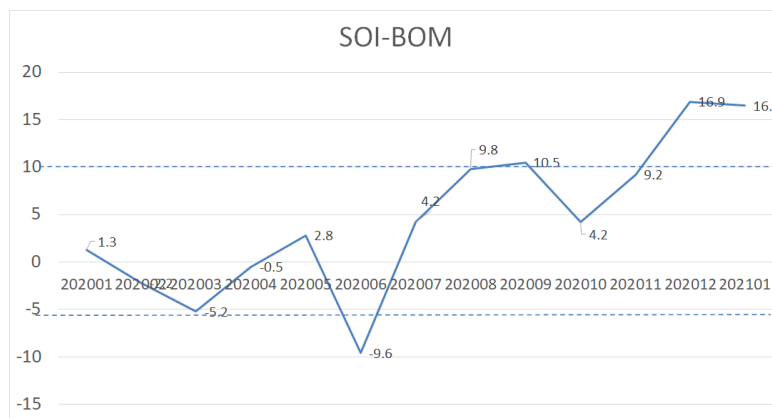
### **5.3 Update on El Niño or La Niña**

La Niña condition prevailed across the Pacific Ocean. Figure 5.8 illustrates the behavior of the standard Southern Oscillation Index (SOI) published by the Australian Bureau of Meteorology (BOM) for the period from January 2020 to January 2021. Sustained positive values of the SOI above +7 typically indicate La Niña while sustained negative values below -7 typically indicate El Niño. Values between about +7 and -7 generally indicate neutral conditions. During this monitoring period, SOI increased from 4.2 in October to 9.2 in November, then increased to 16.9 in December, then decreased to 16.5 in January, indicating a La Niña has developed.

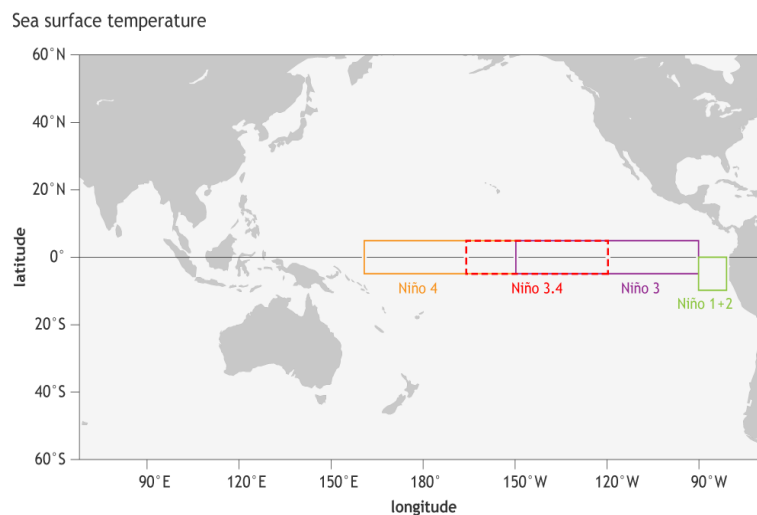


The 2020-2021 La Niña event has passed its peak, but impacts on temperatures, precipitation and storm patterns continue, according to a new update from the World Meteorological Organization (WMO). Despite the general cooling influence of La Niña events, land temperatures are expected to be above-normal for most parts of the globe in February-April 2021. La Niña has a temporary global cooling effect. But this was not enough to prevent 2020 from being one of the three warmest years on record. La Niña and El Niño effects on average global temperature are typically strongest in the second year of the event, but it remains to be seen to what extent the current La Niña will influence global temperatures in 2021.

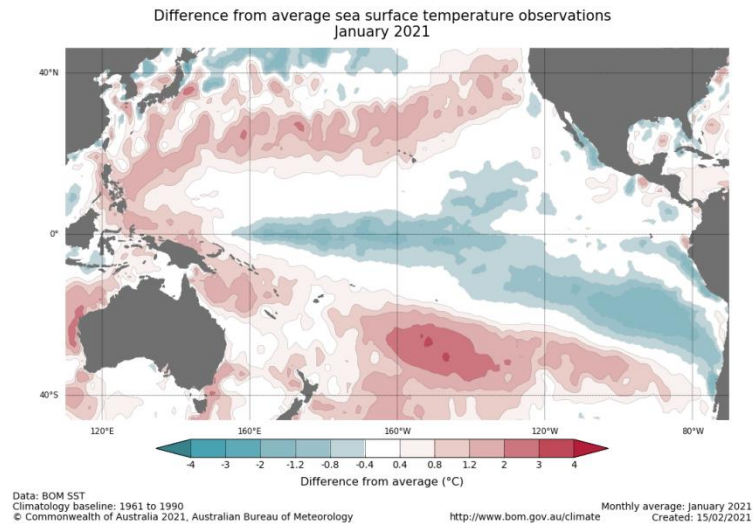
The sea surface temperature anomalies in January values of the three key NINO indices were: NINO3 -0.4°C, NINO3.4 -0.8°C, and NINO4 -0.9°C, respectively, somewhat colder than the 1961-1990 average according to BOM (see Figure 5.9 and Figure 5.10). La Niña has developed and is expected to last into next year, affecting temperatures, precipitation and storm patterns in many parts of the world, according to the World Meteorological Organization (WMO).



**Figure 5.7 Monthly SOI-BOM time series from January 2020 to January 2021 (Source: <http://www.bom.gov.au/climate/current/soi2.shtml>)**



**Figure 5.8 Map of NINO Region (Source: [https://www.climate.gov/sites/default/files/Fig3\\_ENSOindices\\_SST\\_large.png](https://www.climate.gov/sites/default/files/Fig3_ENSOindices_SST_large.png))**



**Figure 5.9 January 2021 sea surface temperature departure from the 1961-1990 average**  
(Source:[http://www.bom.gov.au/climate/enso/wrap-up/archive/20210216.ssta\\_pacific\\_monthly.png?popup](http://www.bom.gov.au/climate/enso/wrap-up/archive/20210216.ssta_pacific_monthly.png?popup))