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 2020 (section 5.1), as well as sections on recent disaster events (section 5.2), and an update on El Niño (5.3).

5.1 CropWatch food production estimates

Methodological introduction

CropWatch production estimates are based on a combination of remote-sensing models combined with global agro-meteorological conditions and meteorological observation data from more than 20,000 agro-meteorological stations around the world. We analyze the conditions and production of the major bulk grain crops (maize, rice, wheat and soybean) in the 43 major food producing countries. The results are as follows:

Production estimates

In 2020, global maize production is expected to be 1,068.010 million tons, due to an increase by 12.9 million tons (+1.2%). Global rice is expected to decrease by 1.1% (-8.41 million tons). Wheat production is estimated to increase by 1.8% to 729 million tons (+12.77 million tons). A slightly lower increase is forecasted for soybean (+0.2%). Production will be 325 million tons. In 2020, the global production of bulk grain and oil crops will be generally stable (Table 5.1).

Table 5.1 2020 cereal and soybean production estimates in thousand tonnes. Δ is the percentage of change of 2020 production when compared with corresponding 2019 values.

	Maize		Rice		Wheat		Soybean	
	2020	Δ%	2020	Δ%	2020	Δ%	2020	Δ%
Afghanistan					5204	-21.5		
Angola	2961	6.6	46	1.6				
Argentina	54054	1.7	1938	4.8	17001	-3.6	52587	2.2
Australia					23376	20.7		
Bangladesh	2589	9.3	45827	-5				
Belarus					2974	1.6		
Brazil	82975	-2.8	11271	-3.3	4110	0.8	99749	-1
Cambodia	953	3	9544	-5				
Canada	12533	5.4			31717	-1.9	8099	5.7
China	225737	0.6	199394	-1.8	127053	2.9	14797	2.5
Egypt	6066	1.8	6776	1.7	12060	2.2		
Ethiopia	7305	1.4			3858	0.7		
France	14832	1.7			33319	-6.4		
Germany	4830	0.8			26629	-4.1		
Hungary	6169	3.8			4786	-2		
India	17521	-4.9	170821	1.6	95806	6.1	12158	7.5

Indonesia	16371	0.1	64501	0.5				
Iran			2970	5.3	17304	7.6		
Italy	6433	1.9			7307	-5.3	1601	1
Kazakhstan					13270	4.1		
Kenya	3119	14			309	1.1		
Kyrgyzstan	707	5.6			626	6.2		
Mexico	22477	1.4			4311	2.9	769	0.2
Mongolia					277	2		
Morocco					6303	-5.3		
Mozambique	2020	-3.1	382	-0.3				
Myanmar	1630	-12.3	27677	0.3				
Nigeria	9845	-14.2	4089	-10.8				
Pakistan	5592	6.9	11269	3.5	27502	4.1		
Philippines	7037	0.8	20488	0.2				
Poland					10720	5.7		
Romania	12332	-7			7173	-7.4		
Russia	13813	4			55843	4.7	3757	3.5
South Africa	11763	1			1472	7.6		
Sri Lanka			2430	1.2				
Thailand	4780	12.1	40625	2.7				
Turkey	6727	-2.2			19337	3.9		
Ukraine	28297	2.3			20534	-1.9		
United Kingdom					12726	-5.5		
United States	378120	2.6	11656	1.2	52659	-3.7	106107	3.4
Uzbekistan					8187	0.2		
Vietnam	5228	1	42929	-6.5				
Zambia	1969	5.1			82	1		
Total	**976785**	**1.1**	**674633**	**-0.8**	**653835**	**1.5**	**299624**	**1.9**
Others	**91225**	**2.7**	**70640**	**-4.1**	**75075**	**4.3**	**25094**	**-16.1**
Global	**1068010**	**1.2**	**745273**	**-1.1**	**728910**	**1.8**	**324718**	**0.2**

Maize

U.S. maize production is forecasted at 378.12 million tons, an increase by 2.6%. The main reason for the increase is the generally favorable weather conditions in the main maize-producing areas. Due to the average distribution of precipitation, maize yields will increase by 4.2%, offsetting the impact of the area reduction. China's maize production will increase slightly by 0.6%, reach to 225.737 million tons, while production in the world's third-largest maize producer, Brazil, decreases by 2.8% to 82.975 million tons. Argentina's maize production was 54.054 million tons with an increase of 1.7%. Most European countries have recovered from the dry weather conditions during early spring. Countries such as Germany, France, Hungary, Italy and Ukraine have maintained normal precipitation since the maize sowing period and maize production has

generally increased. In Mozambique, Myanmar, Nigeria and Turkey, drought occurred during the key growth periods of maize jointing and tasseling, and the yield of maize decreased by 3.1%, 12.3%, 14.2%, and 2.2% respectively. In Romania, affected by drought during the planting period, the growth period of maize was lagging behind as compared to previous years and the planting area was low, resulting in a 7.0% reduction in maize production. Early warning indicators of crop planting area show that India's maize planting area has shrunk by 4.6%, leading to a reduction in maize production. The maize output of other countries has increased by different degrees. The production situation in the countries from which China sources its maize import and the global maize supply comes remains normal.

Rice

Affected by drought, rice production in Brazil, Cambodia, Vietnam, and Nigeria decreased by 3.3%, 5.0%, 6.5%, and 10.8%, respectively. Bangladesh's rice production decreased by 5.0%, Mozambique's rice production decreased slightly by 0.3% and other major rice producers all experienced a small production increase. However, affected by floods and unfavorable agrometeorological conditions in the world's largest rice producing country, China, rice production decreased by 1.8% with a reduction of 3.69 million tons. Since the output of other small rice producers fell by 4.1%, global rice production decreased 8.41 million tons, which is a 1.1% reduction at the global scale. In general, the global rice production and supply situation are stable.

Wheat

Most of the winter wheat in the main producing countries in the northern hemisphere has been harvested in June 2020. Wheat was under drought stress in many European major wheat producing countries such as France, Germany, Hungary, Italy, Romania, Ukraine and the United Kingdom, where wheat output was reduced by 6.4%, 4.1%, 2.0%, 5.3%, 7.4%, and 1.9% respectively. During the COVID-19 pandemic, travel bans from various countries have also affected the timely harvest of wheat to varying degrees in some countries. The wheat producing areas in the United States suffered from a cold wave in mid-April and the wheat in the flowering period was affected, resulting in an output reduction by 3.7%. Even so, global wheat production still increased by 12.77 million tons, mainly due to the increase of wheat production in the three major wheat-producing countries: China, India and Russia, by 2.9%, 6.1%, and 4.7%. Meanwhile, wheat production of Iran, Turkey, Kazakhstan, Kyrgyzstan, Pakistan and Poland, as well as Mexico, Australia, Brazil, South Africa, Zambia and other countries in the southern hemisphere have also increased. Overall, the global wheat supply situation is good.

Soybean

In 2020, Brazil's soybean production decreased slightly by 1.0% to 99.749 million tons. The output of the main soybean producing countries increased except for Brazil. Thanks to the good agro-meteorological conditions in the main soybean producing regions, the yield of soybeans in the United States increased by about 3.3%. The country's soybean production is expected to increase by 3.5% to 1061.07 million tons, surpassing Brazil again to become the world's largest soybean producer in 2020. It needs to be emphasized that the enthusiasm of US farmers to plant soybeans is still not high, and the soybean planting area increased slightly by 0.2%, which is still significantly lower than the peak level in 2018. Soybean production in Argentina increased by approximately

2.2% to 52.587 million tons. Early warning indicators of crop planting area show that soybean planting area in India has increased significantly by about 7.5% and soybean production in India is expected to increase. China has continued the trend of continuous soybean production increases during recent years and its soybean production increased by 2.5%. The total global soybean production increased slightly by 0.2% and the production of major soybean exporting countries increased. The global soybean market is expected to be generally stable.

5.2 Disaster events

Introduction

The number of people exposed to the risk of acute hunger increases in 2020 according to United Nations estimates. The recently released 2020 Global report on food crises estimated that additional 83 million people, and possibly as many as 132 million, are expected to go hungry in 2020. This massive setback has thrown people into further doubt as to whether the Sustainable Development Goal 2 (Zero Hunger) can be achieved. The main drivers of increasing the global hunger risk were reported as; the conflict/insecurity, weather extremes, desert locusts, economic shocks, and COVID-19. Although Asia remains home to the greatest number of undernourished people (381 million), Africa is second (250 million) but with the portion of its people (19.1%) undernourished compared to 8.3% in Asia. Thus, Africa is the hardest hit continent on current trends and by 2030, more than half of the world chronically hungry is expected to be in Africa (Figure 5.1). This must be taken as a serious call of actions by local governments to cope with current and future hunger threat.

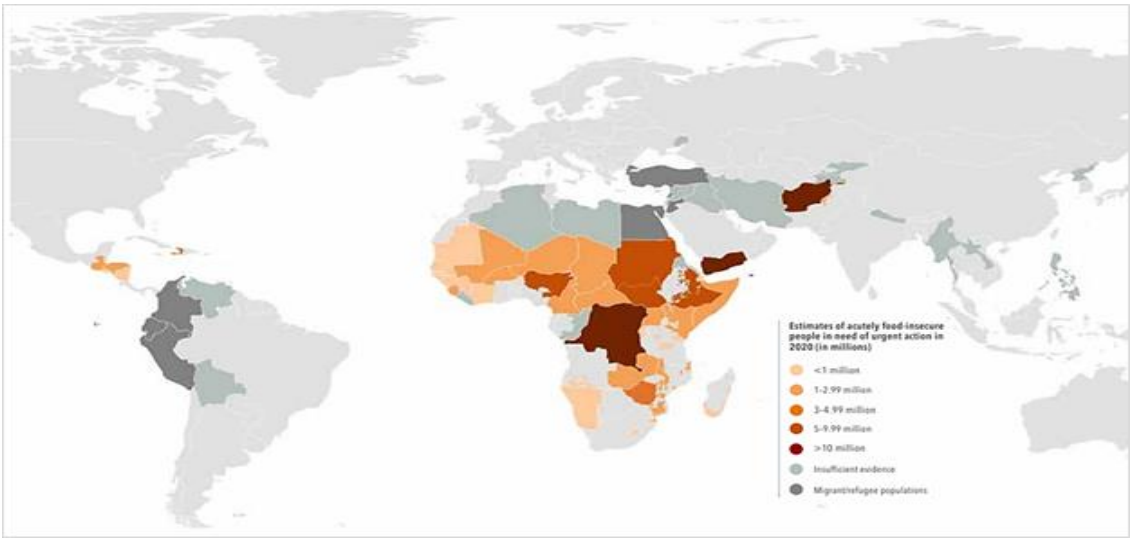

Figure 5.1 **Estimates of acutely food-insecure people in need of urgent action in 2020 (in millions).** This map reflects analyses produced before COVID-19 became a pandemic and does not account for its direct and/or indirect impact on acute food insecurity (Source: FSIN GRFC March 2020).

The entry point to analyze the main disasters that threaten the global food security, during the current reporting period, is monitoring the weather conditions due to its connections to many disasters (such as drought, floods, etc.). During the current reporting period (April - July 2020), rainfall amount was significantly higher than the 15-year average in western African coast (Senegal, Mauritania, Morocco), Eastern Africa (Kenya, Tanzania, Ethiopia, and Somalia), Arabian Peninsula (Saudi Arabia, Yamen and Oman), Central Asia (such as in Iran, Afghanistan, Uzbekistan,

Kazakhstan, Turkmenistan, and Tajikistan), Ukraine, Russia, Mongolia, and India, as measured by CropWatch in Figure 5.2. While the average temperature was particularly above average in Mexico and Venezuela (South America), Portugal and France (in Europe), Oman and Thailand (in Asia), and Nigeria, Niger, Togo, Ghana and Cote le ’ devoir (in Africa), significantly below-average temperature was observed in the South African region, north and east Europe, India, and Canada, as in Figure 5.3.

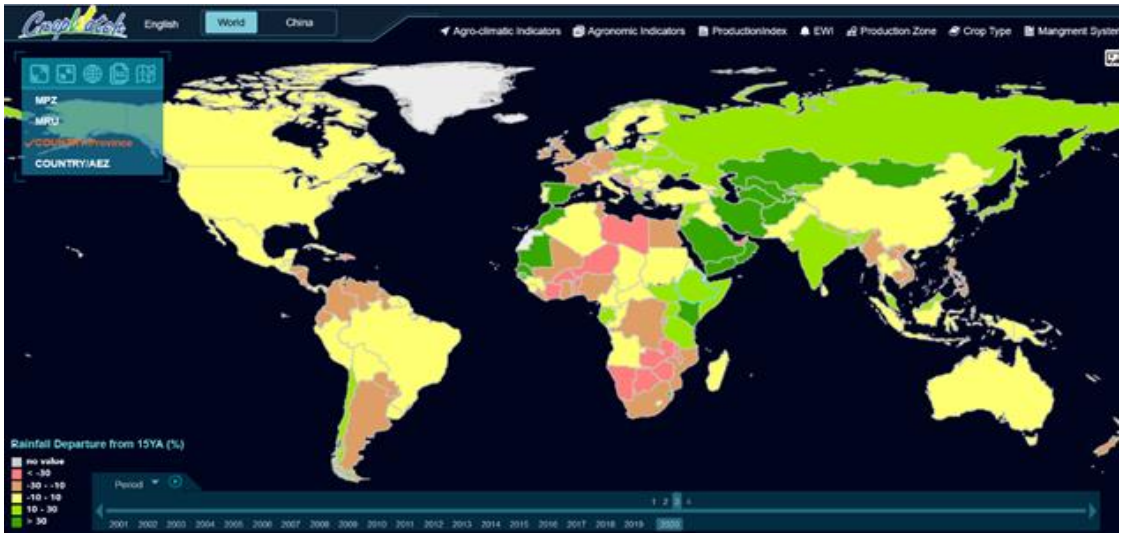

Figure 5.2 Agro-climatic indicators (Rainfall Departure from 15YA). Source; CropWatch Explorer (http://cropwatch.com.cn/newcropwatch/main.htm).

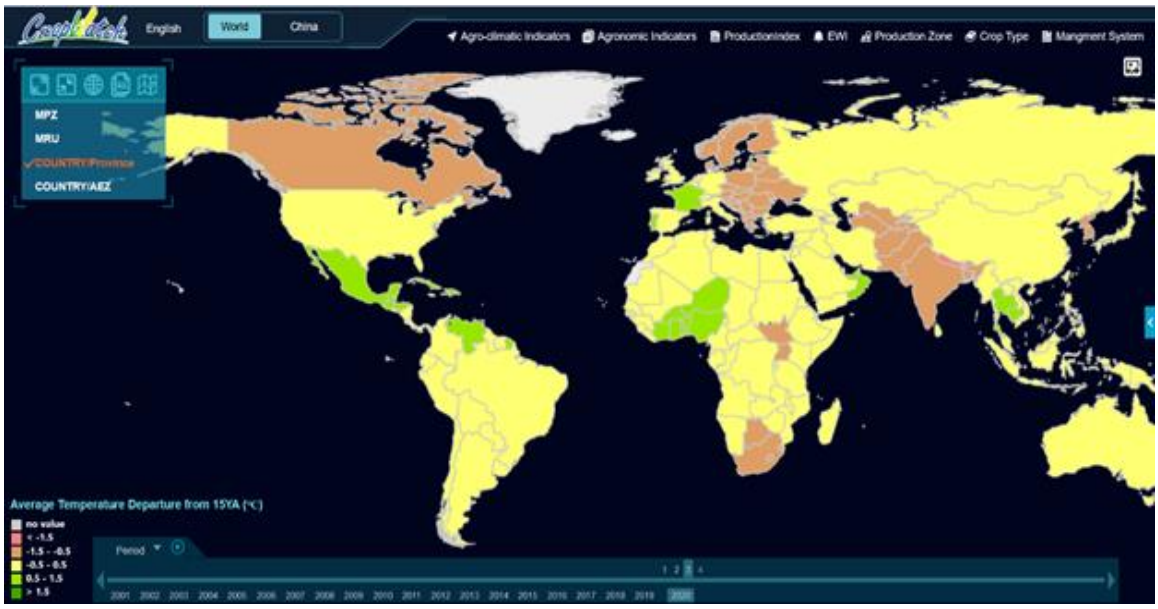

Figure 5.3 Agro-climatic indicators (Average temperature departure from 15YA). Source; CropWatch Explorer (http://cropwatch.com.cn/newcropwatch/main.htm).

Extreme conditions by type

COVID-19

Many reports around the world indicated the rising of food prices due to COVID-19, particularly in the U.S. At the beginning of the pandemic, customers rushed to stock up on foods leading to a sudden and sharp increase in food demand and prices. Besides, the sharp restrictions on movements also increased demand for food from grocery stores, rather than going to restaurants. The pandemic has also increased the trade conflicts, supply chain slowdowns, and agro inputs shortage, and delayed the planting.

Another aspect of concern is the overlapping between COVID-19 and other disasters over particular regions, such as the desert locust over East Africa, floods in China and drought conditions over South-East Asia. The restrictions on the movement of people or goods could hamper the efforts of fighting against the spread of desert locusts. Furthermore, the restrictions in human flow during the COVID-19 pandemic in China affected the regular the construction of hydraulic projects on the Yangtze River, which were scheduled in the winter of 2019 and spring of 2020, as reported by National Disaster Reduction Centre.

Only time will reveal the severity of the impacts on agriculture from the novel coronavirus. The current challenge for the agriculture sector is continuing farming and livestock activities in the face of COVID-19 health threats and control measures.

Desert locust

The frequent cyclones of the Indian Ocean, mostly due to global heating, are causing heavy rains, particularly over east Africa and Yemen. The heavy rains created perfect breeding conditions for locusts leading to an increase in the spring swarms second-generation. Swarms are moving towards the north highland and eastern coast of Ethiopia coming from Yamen and Kenia, to join existing swarms. The large numbers of swarms by now are mainly clustered in the north and east Ethiopia and northwestern Somalia. These groups are expected to move towards India and Pakistan in early August. In Asia, a large number of swarms were reported in the Indo-Pakistan border (Figure 5.4).

With more heavy rains, Yamen and Ethiopia are likely to be the epicenter of summer infestations. The second generation of summer breeding is expected to start in September, and swarms could reach Nepal. Good rains in summer breeding areas in the Sahel and West Africa are expected to raise favorable breading conditions (Figure 5.5).

Locusts keep causing huge devastation to cropland areas in threatened regions; however, large scale control operations are running. As reported by FAO, the total area treated in July was more than 222,446 ha compared to 331,126 ha in June, particularly in India (102,645 ha), Ethiopia (79,574 ha), Kenia (38,769 ha), and Pakistan (33,599 ha).

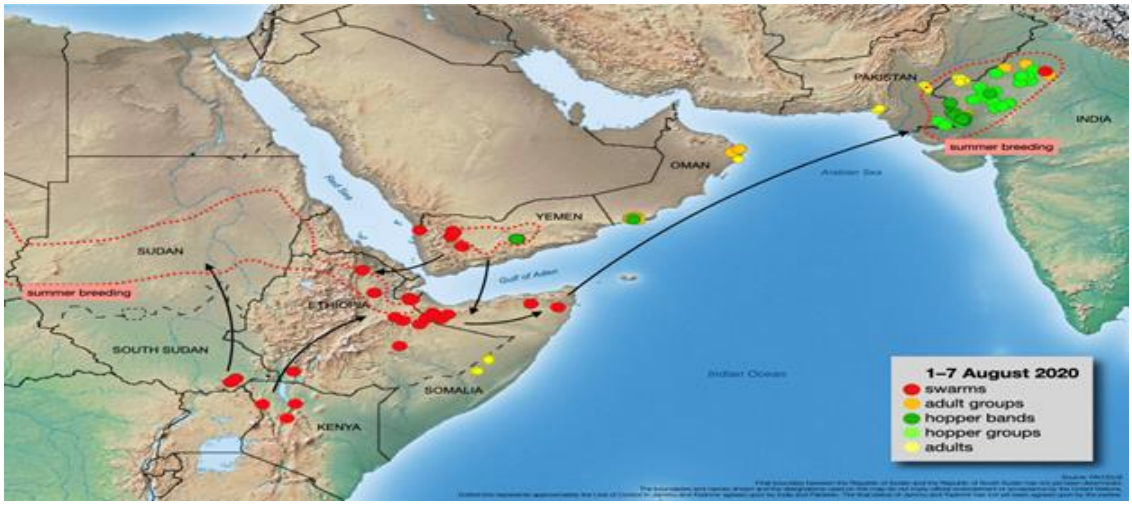

Figure 5.4 FAO desert locust bulletin, the current situation during July 2020. Source: http://www.fao.org/ag/locusts/common/ecg/75/en/200807DLupdate.jpg

Figure 5.5 FAO desert locust bulletin, forecast until mid-September 2020. Source: http://www.fao.org/ag/locusts/common/ecg/75/en/200803forecast.jpg)

Floods

In Africa, in late July, the White Nile has caused flooding in Jonglei State, South Sudan. The UN Office for the Coordination of Humanitarian Affairs (OCHA) initially reported more than 5,000 people were displaced, while thousands of homes have been reportedly destroyed, along with crops and livestock damages. In Ethiopia, OCHA reported the displacement of more than 30,000 people due to floods in Afar, Gambella, Oromia, and SNNP regions since 20 July. OCHA reports that all major rivers in the Gambella region are at full capacity where hundreds of hectares of crops have been damaged in the region. In Niger, the situation was even more serious since 9 people had died, 20174 people affected and 2244 houses destroyed. Severe floods were reported in the regions of Maradi and Tahoua due to heavy rains and floods by end of July. Additional cases of floods in Africa (from Mali and Nigeria) were reported by OCHA.

In Yemen, ongoing rain and flash floods continue to cause infrastructure damages, destroying homes and shelters and causing death and injuries. About 130 persons have died and 35,000

families have been affected by the flooding since late July. In northeastern India, flooding began in Bihar state in mid-July, initially affecting around 300,000 people.

In China, since early June 2020, unprecedented floods have severely impacted large regions in the upper and middle river basin of the Yangtze, due to heavy rains caused by the regional rainy season. The severely impacted regions were in southern China, including Guangxi, Guizhou, Sichuan, Hubei, Yunnan, Hunan and Chongqing provinces. With more rain, floods started to extend to lower regions of the Yangtze basin such as Anhui, Jiangxi, Zhejiang and Fujian. The Yangtze flows through some of the most productive agricultural, economic and industrial centers in China. By the middle of August, the floods have affected 63.46 million people and caused a direct economic loss of 178.96 billion CNY, according to the Chinese Ministry of Emergency Management. About 219 people were found dead or are missing, and 54,000 houses collapsed. Great efforts were made by national government to cope with the disaster impacts by allocating about 309 million yuan (44.2 million U.S. dollars) for disaster relief in flood-hit regions and deploying more than 7,000 officers and soldiers to participate in flood fighting and emergency rescue tasks. With the consideration of growing season and production areas, crops such as rice, rapeseed and cotton crops could be the most affected by the flood since their production areas are largely located in the Yangtze River Basin.

Intensive monsoon rains caused widespread flooding in South Asia. The Bangladesh Flood Forecasting and Warning Center reported that almost 1 million homes had been inundated as of July 31. 150'000 ha of farmland had been damaged. This flooding occurred in the middle of the main growing season for rice. While most farmers are growing flood tolerant varieties, prolonged submergence will reduce the yield potential and can even kill the crops.

Drought

A severe drought was observed over South-East Asia, particularly in Cambodia, Thailand, and Vietnam. The severe drought conditions were driven by the El Niño weather phenomenon that leads to a huge reduction in seasonal rains. Therefore, many rice farmers in the region have been unable to plant their main crop, raising fears of a heavily diminished harvest this fall.

Europe has suffered from severe drought during this season. In Romania, severe drought caused huge damage to wheat (southeast near the Black Sea), while in Ukraine, the drier-than-average conditions throughout early spring, leading to deteriorating conditions to wheat production, particularly in Odessa and Crimea. The wheat crop in the United Kingdom (UK) has also struggled due to the drought that occurred during late spring and caused extensive damage to the winter crops. Mild drought conditions were reported in Hungary and Bulgaria (Figure 5.6).

In Africa, delayed planting of peanuts in South Senegal was also reported. Planting typically begins in southern Senegal in May, but a late onset of rains in May delayed planting. While in South America, a large reduction in Mexico cotton planted area has been reported and was attributed to seed shortages and drought (Figure 5.6).

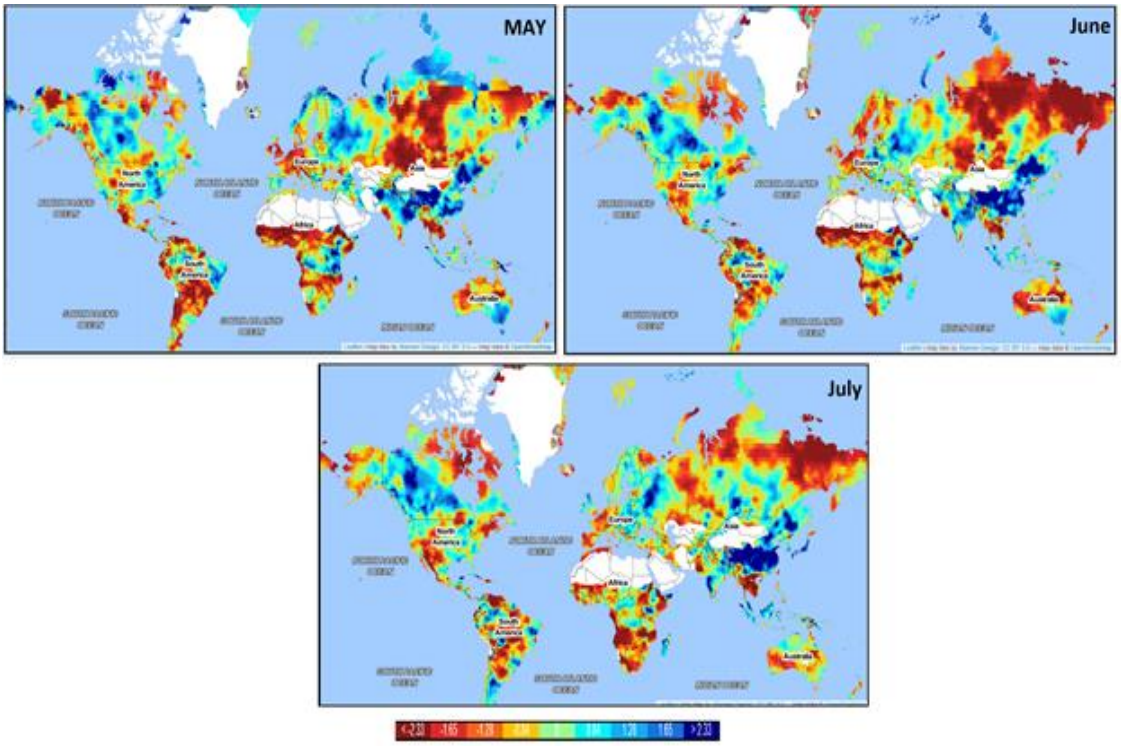

Figure 5.6 The Standardised Precipitation-Evapotranspiration Index (SPEI) estimated globally for the months; May to July of 2020, Source: (https://spei.csic.es/map/)

Fires

Thousands of fires alarms were reported on the Global Forest Watch website (https://www.globalforestwatch.org/) over the central African region (Angola, Tanzania, Zambia, and the Democratic Republic of the Congo) by end of June and early July. Fires of this number are not uncommon at this time of year in Africa. This period (June - early July) is usually the time for clearing agriculture fields and land preparation for the next growing season. It is a common agriculture practice for farmers to set fire to the remains of old crop fields to rid them of the leftover grasses and scrub. This action also helps return nutrients to the soil to ensure a good crop during the next planting season. Not in Africa only, "Slash and burn" agriculture is a common practice in other regions as well, including parts of northern South America, and Southeast Asia (Figure 5.7).

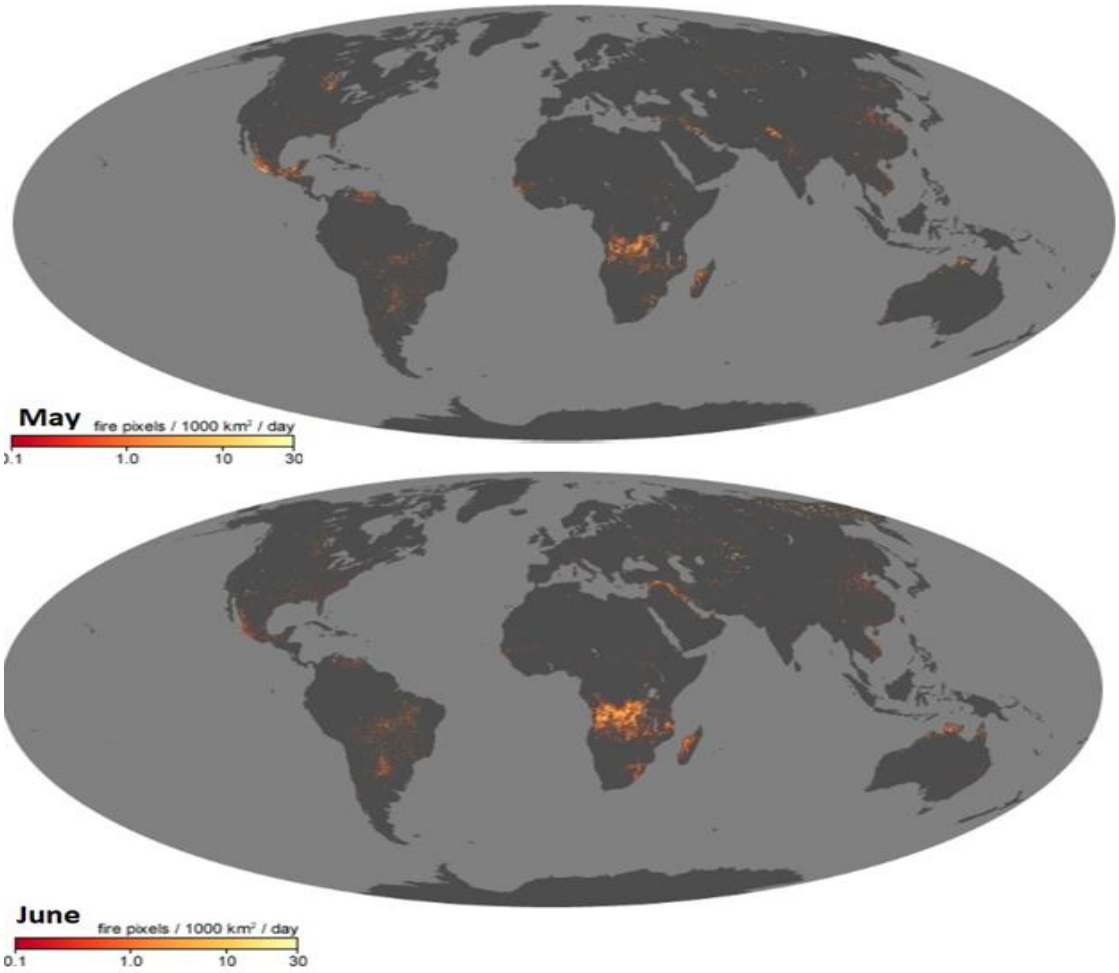

Figure 5.7 Fires occurred during May and June 2020.

Source: https://earthobservatory.nasa.gov/global-maps/MOD14A1_M_FIRE

5.3 Update on El Niño

Neutral El Nino 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 July 2019 to July 2020. 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 -0.5 in April to 2.8 in May, then decreased to -9.6 in June, then increase to 4.2 in July, indicating a neutral El Niño situation.

The sea surface temperature anomalies in July 2020 for NINO3, NINO3.4, and NINO4 regions were -0.3°C, +0°C, and +0.2°C, respectively, somewhat warmer than the 1961-1990 average according to BOM (see Figure 5.8 and Figure 5.9). Both BOM and NOAA conclude that the currently warmer conditions indicate a neutral El Niño (www.climate.gov/enso). CropWatch will keep monitoring the situation (Figure 5.10).

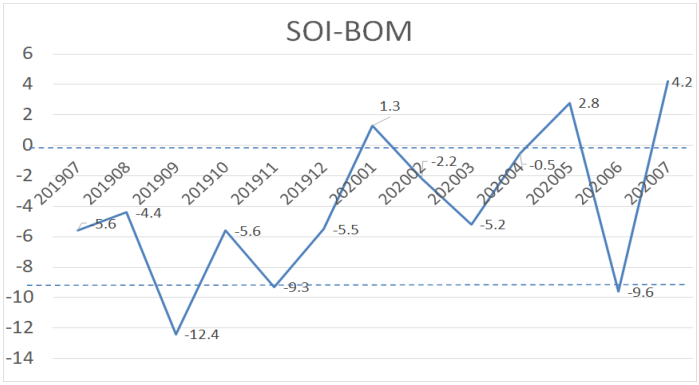

Figure 5.8 Monthly SOI-BOM time series from July 2019 to July 2020 (Source: http://www.bom.gov.au/climate/current/soi2.shtml)

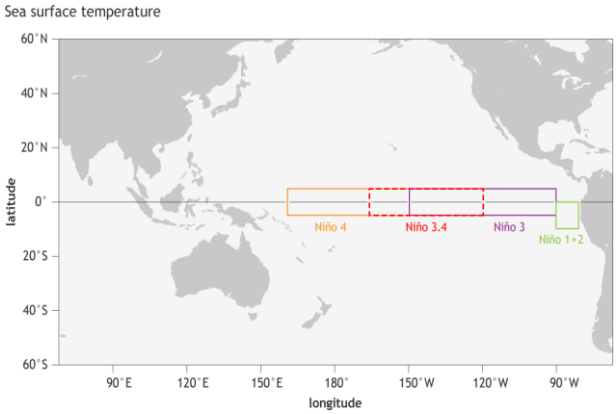

Figure 5.9 Map of NINO Region (Source: https://www.climate.gov/sites/default/files/Fig3_ENSOindices_SST_large.png)

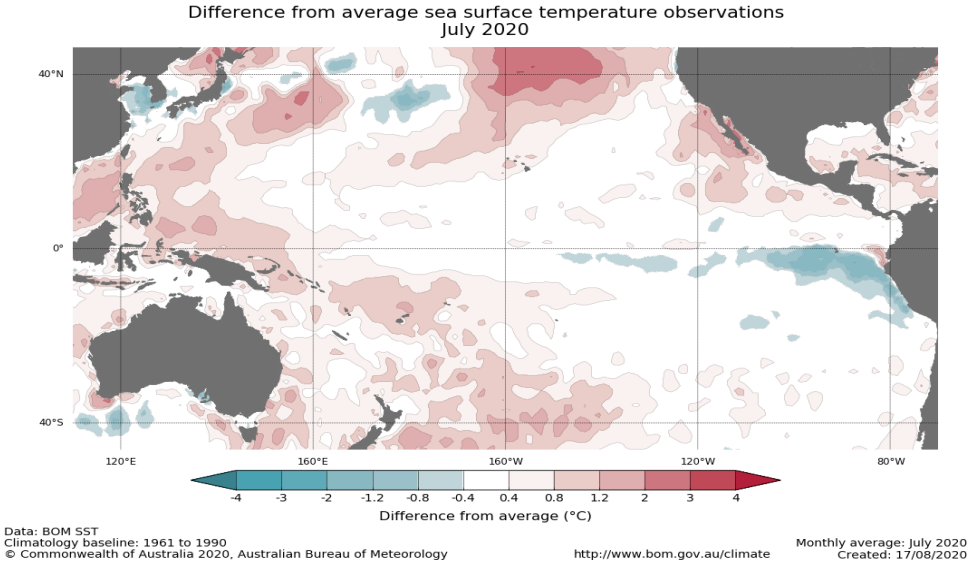

Figure 5.10 July 2020 sea surface temperature departure from the 1961-1990 average (Source:http://www.bom.gov.au/climate/enso/wrap-up/#tabs=Sea-surface**)**