



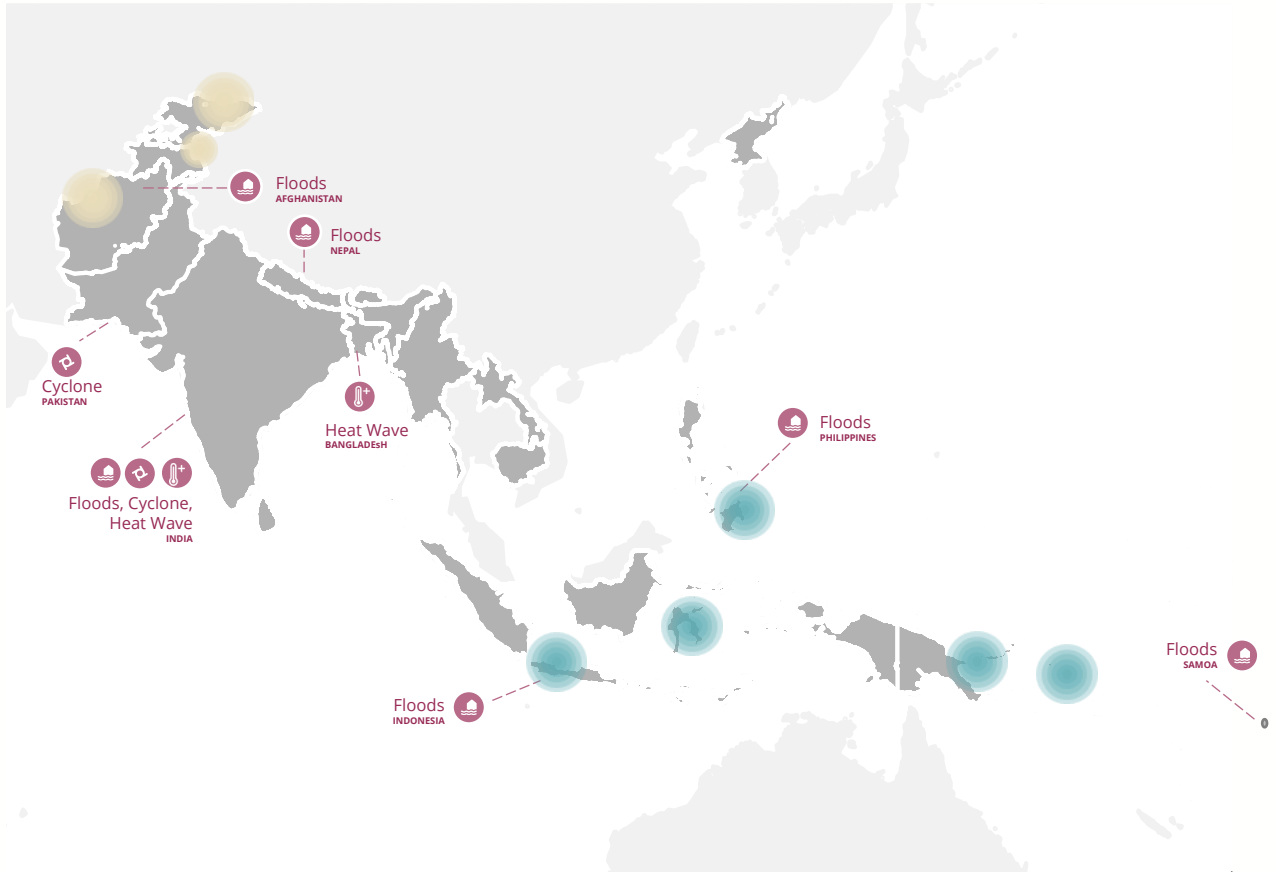
# Seasonal Monitor

Asia and the Pacific, June 2023





REGIONAL BUREAU FOR ASIA AND THE PACIFIC

# I. Climate-related concerns



## MARCH-JUNE 2023 RAINFALL PERFORMANCE

 There was moderate to heavy rainfall in the southern Philippines, eastern Fiji, Indonesia, Papua New Guinea, Solomon Islands, and eastern Timor-Leste. Growing wet season rice continued under good weather conditions except in flood-affected areas.

 Drier-than-average conditions continued in western Afghanistan, the Kyrgyz Republic, and Tajikistan. Harvesting of winter barley and wheat crops began, and planting of spring season crops continued under mixed weather conditions in these countries, with a high risk of locust infestations to crops.

## RECENT CLIMATE HAZARDS (JUNE 2023)

### Afghanistan – Floods (June 2023)

Heavy rains and flash floods injured at least 3 people, with dozens of houses and hundreds of acres of farmlands damaged in Badakhshan Province.<sup>1</sup>

### Bangladesh – Heat Wave (June 2023)

The longest heat wave affected people across the country, with thousands of schools closed.<sup>2</sup>

### India – Cyclone/Floods, Heat Wave (June 2023)

**Cyclone** Biparjoy caused floods in Gujarat province, and heavy rains caused floods in Assam province, over 119,000 people were affected in Assam province.<sup>3,4</sup> The extreme heat wave killed at least 98 people in Bihar State and Uttar Pradesh State.<sup>5</sup>

### Indonesia – Floods (June 2023)

Heavy rains caused floods and landslides in western Java and northern Sulawesi. About 1,600 people (557 households) were affected in South Bolaang Mongondow.<sup>6,7</sup> While droughts affected about 7,500 people (2,500 households) in Cilacap, Central Java.<sup>8</sup>

### Nepal – Floods (June 2023)

Heavy rains caused floods and landslides in Koshi province, about 283 households were affected, with at least 5 people killed.<sup>9</sup>

### Pakistan – Cyclone (June 2023)

Cyclone Biparjoy caused heavy rains and landslides in Sindh province, over 80,000 people were displaced.<sup>10</sup>

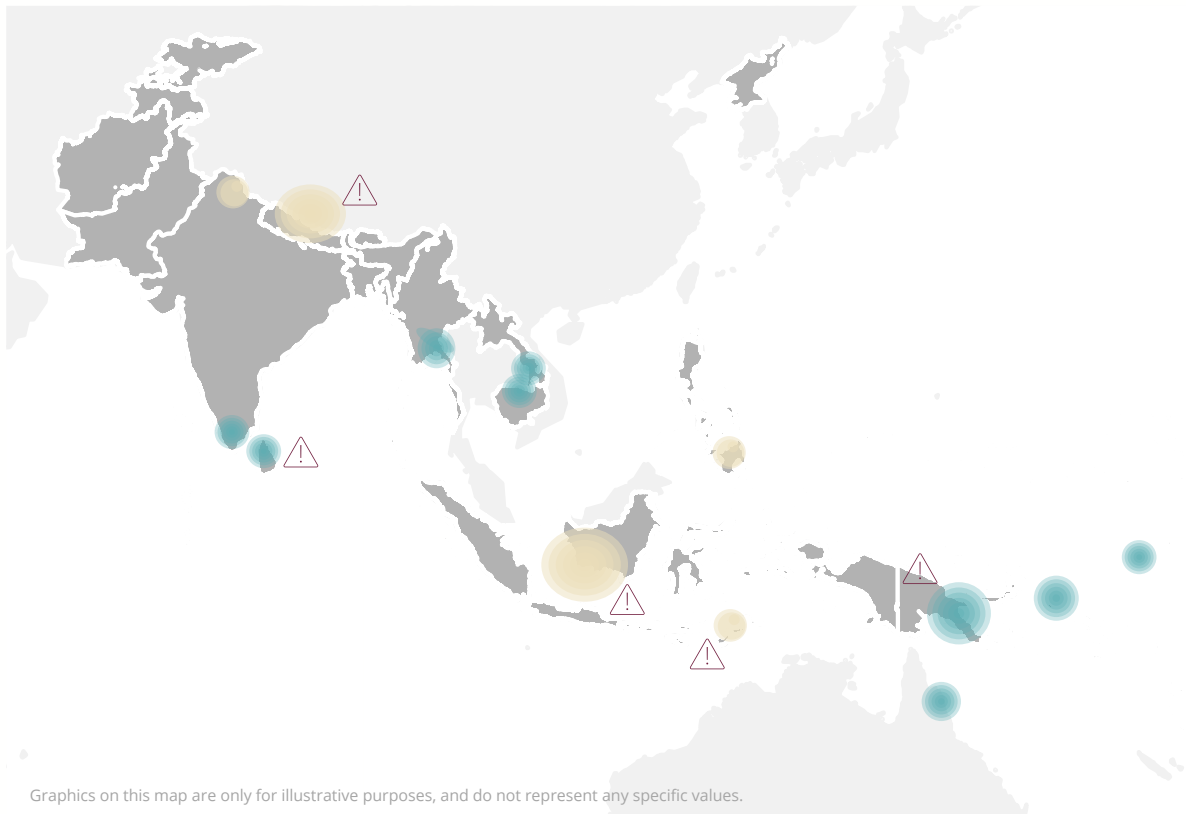
### Philippines – Floods (June 2023)

Heavy rains caused floods in the south, affecting 94 households (360 people) in Sultan Kudarat province and 2,358 people (786 households) in Davao del Norte province.<sup>11,12</sup>

### Samoa – Floods (June 2023)

Heavy rains caused floods and landslides across some parts of Savai'i region, Farms were damaged with many households affected.<sup>13</sup>

## II. Seasonal outlook





### SEASONAL OUTLOOK (JULY-SEPTEMBER 2023)

-  **Wetter than normal rainfall:** Wetter conditions are likely in Cambodia, southern India, Kiribati, Solomon Islands, Sri Lanka, Tuvalu, and some parts of southern Lao PDR, southern Myanmar, and southern and eastern Papua New Guinea.
-  **Lower than normal rainfall:** Drier conditions are projected in Indonesia, northern India, Nepal, southern Philippines, western Papua New Guinea, and Timor-Leste.
-  **Cyclone activity:** El Niño is anticipated from July to September 2023 and the potential for the formation of low tropical cyclones near the eastern seaboard of northern Luzon, in the Philippines from 3 to 9 July.<sup>14</sup>
-  **Warmer than normal temperature;** Warmer conditions are likely across major parts of Asia and Pacific

### La Niña/El Niño outlook

El Niño will continue in the next coming months (July to September 2023) at 96 percent possibility, and likely to continue until early 2024 (January-March 2024) at 74 percent possibility (Figure 1)<sup>15</sup>. El Niño contributes to drier conditions across South and Southeast Asia during the monsoon season (July-September) and wetter conditions in the western coastal region of Southeast Asia.

-  High risk of flood caused by impacts of El Niño conditions: Sri Lanka
-  High risk of drought caused by impacts of El Niño conditions: northern India, Nepal, Indonesia, western Papua New Guinea, southern Philippines, Timor Leste

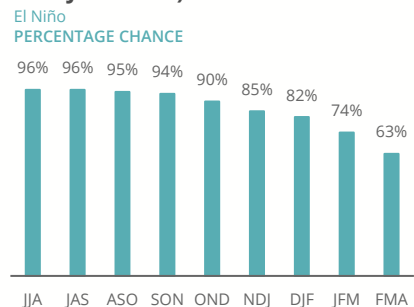
### ESTIMATED CROP PRODUCTION (2023)

2023/2024 agricultural prospects (rice, wheat, barley, and maize) are generally favourable in the region. However, the strong impacts of El Niño this year are expected to have negative impacts on rainfall patterns and crop production in Sri Lanka with high risk of floods, and drier than average may reduce rice outputs in Nepal, Indonesia, and Timor Leste.

An outbreak of Moroccan locusts was observed across Afghanistan and Tajikistan during January-June 2023. In Afghanistan, there is a high risk of locust infestations of 700,000 – 1.2 million metric tons of wheat in this year.






















Costs of agricultural production (chemical fertilizers, fuel, etc) continued to increase in Myanmar, Sri Lanka, and Pakistan due to depreciation of local currency which may reduce the 2023/24 rice production in these countries.

**FIGURE 1: IRI/CPC PROBABILISTIC ENSO OUTLOOK (RELEASED 16 June 2023)**








<sup>15</sup> Source: IRI Climate Forecasts

### III. Potential Drivers of Food Insecurity in June 2023






Country	Rainfall Performance (11-20 Jun 23)	Short-Term Forecast (1-10 Jul 23)	Long-Term Forecast (Jul-Sep23)	Projected Crop Production 2023	Conflict / Displacement	Inflation (%)		Food Inflation (%)		Currency Exchange (% Jun) 1M	Moderate or Severe Food Insecurity (%)
						1M	Inflation Date	1M	Inflation Date	YoY	
Afghanistan				 W ▲		-2.8 ▲	May'23	-5.8 ▲	May'23	8.3 ▲	35% <sup>a</sup>
Bangladesh				 R ▲		9.7 ↔	Jun '23	9.7 ▲	Jun '23	-14.6 ▲	31% <sup>b</sup>
Bhutan				NA		3.4 ↔	May '23	3.22 ▲	May '23	-5.0 ▼	
Cambodia				 R ▲		0.5 ▼	May'23	2.2 ↔	May'23	-1.4 ↔	6% <sup>c</sup>
Fiji				NA		0.8 ▼	May '23	8.1 ▲	May '23	-2.6 ▼	8% <sup>d</sup>
India				 R ▲		4.8 ▲	Jun'23	4.5 ▲	Jun'23	-5.0 ▲	
Indonesia				 R ↔		3.5 ▼	Jun'23	2.9 ▼	Jun'23	-1.5 ▼	
Kyrgyz Rep				 W ▲		10.5 ▼	Jun '23	6.7 ▼	Jun'23	-9.1 ▼	10% <sup>e</sup>
Laos				 R ▲		28.6 ▼	Jun '23	42.7 ▼	Jun '23	-20.0 ▲	13.3% <sup>f</sup>
Myanmar				 R ↔		19.6 ↔	Jul '22	18.4 ▲	Jul '22	-11.6 ↔	27% <sup>g</sup>
Nepal				 R ▲		6.83 ↔	Jun '23	5.66 ▼	Jun '23	-5.9 ▲	14.6% <sup>h</sup>
Pakistan				 R ▲		29.4 ▼	Jun'23	39.5 ▼	Jun'23	-28.6 ▲	29% <sup>i</sup>
Philippines				 R ▲		5.4 ▼	Jun'23	6.7 ▼	Jun'23	-3.9 ▲	15% <sup>j</sup>
Sri Lanka				 R ↔		12.0 ▼	Jun'23	4.1 ▼	Jun'23	18.6 ▲	17% <sup>k</sup>
Tajikistan				 W ▲		2.4 ▼	May '23	1.3 ▼	May '23	-1.2 ▼	18% <sup>l</sup>
Timor Leste				 R ▲		7.1 ▼	May'23	7.7 ▼	May'23	NA	20% <sup>m</sup>

**LEGEND**

**RAIN PERFORMANCE**

-  Rainfall > 140percent = heavy rainfall
  -  Rainfall 110-140percent = slight to moderate rainfall
  -  Rainfall 90-110percent = normal condition
  -  Rainfall 60-90percent = slight to moderate drought
  -  Rainfall < 60percent = severe drought
- Abnormally high/low amounts of rain can affect crop production and lead to food insecurity.*

**CROP PRODUCTION**

-  Severe drought's effect on crop production
  -  Extensive floods effect on crop production
  -  High prices of agricultural inputs effect on crop production
  -  Locust outbreaks effect on crop production
  -  Shortage of farm workers
- ▲ 2022/23 outputs of rice/wheat crops increased by more than 5 percent from the five-year average level (2017-2021)
  - ▼ 2022/23 outputs of rice/wheat crops decreased by more than 5 percent
  - ↔ 2022/23 outputs change of rice/wheat crops between -5 percent to 5 percent

- W Wheat
- B Barley
- R Rice
- M Maize



**INFLATION/FOOD INFLATION**

- ▲ (Food) inflation rate change increased by more than 5 percent in last month
- ▼ (Food) inflation rate change decreased by lower than 5 percent in last month
- ↔ (Food) inflation rate change between -5 percent to 5 percent in last month

**CURRENCY EXCHANGE**

- ▲ Exchange rate change increased by more than 5 percent in last month
- ▼ Exchange rate change decreased by more than 5 percent in last month
- ↔ Exchange rate change between -5 percent to 5 percent in last month

**CONFLICT AND DISPLACEMENT**

-  Conflict
-  Displacement.7
- NA : updated data not available

<sup>a</sup> Afghanistan' IPC May-October 2023  
<sup>b</sup> Bangladesh IPC May-September 2023, not representative at the national level (only hotspot areas covered)  
<sup>c</sup> Cambodia Food Security and Nutrition Assessment Flood Prone Areas: October 2022  
<sup>d</sup> Fiji Food Security Analysis Round Fourteen: March 29/23  
<sup>e</sup> Kyrgyz Republic Price Monitoring for Food Security: June 2023  
<sup>f</sup> Lao PDR Food Security Monitoring: April/May 2023  
<sup>g</sup> Myanmar DIEM, Data in Emergencies Monitoring Brief round 4: January 2023  
<sup>h</sup> Nepal Household Livelihoods, Food Security, and Vulnerability Survey round 8: April 2023  
<sup>i</sup> Pakistan IPC April-October 2023, not representative at national level. Only covered Balochistan, Khyber Pakhtunkhwa, and Sindh  
<sup>j</sup> Philippines IPC April 2023  
<sup>k</sup> Sri Lanka Crop and Food Security Assessment Mission: May 2023  
<sup>l</sup> Tajikistan Quarterly Household Food Security and Market Update July-September 2022: October 2022  
<sup>m</sup> Timor-Leste IPC February 2023

# Zone 1

## Afghanistan, the Kyrgyz Republic, Pakistan, and Tajikistan Rainfall Performance, March-June 2023

In **March-June 2023**, drier-than-average conditions remained in western Afghanistan, the Kyrgyz Republic, and Tajikistan with less than 50 mm of average monthly rainfall (Map 1).

In the last month, **20 May-20 June 2023**, drier-than-average conditions continued in major parts of the Kyrgyz Republic and Tajikistan, but light rainfall (up to 50 mm of average monthly rainfall) was observed in some parts of eastern Afghanistan and major parts of Pakistan (Map 2).

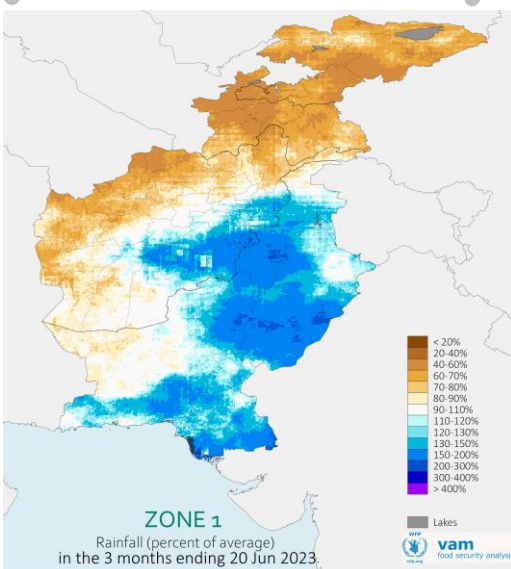
In **Afghanistan**, heavy rains caused flash floods across Badakhshan province on 11 June 2023, at least 3 people injured, dozens of houses damaged, and hundreds of acres of farmland damaged. <sup>16</sup>

In **Pakistan**, heavy rains and strong winds from 10 to 11 June 2023 killed at least 15 people with 100 people injured in Khyber Pakhtunkhwa province. <sup>17</sup>

Cyclone Biparjoy caused landfills and heavy rains across Sindh province on 15 June 2023, as of 16 June, over 80,000 people (about 12,000 households) were displaced. <sup>18</sup>

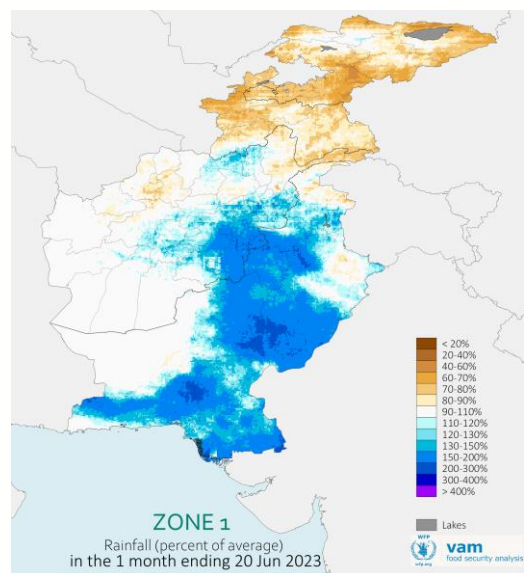
MAP 1: LAST THREE MONTHS

20 MAR 2023 — 20 JUN 2023



MAP 2: LAST MONTH

20 MAY 2023 - 20 JUN 2023



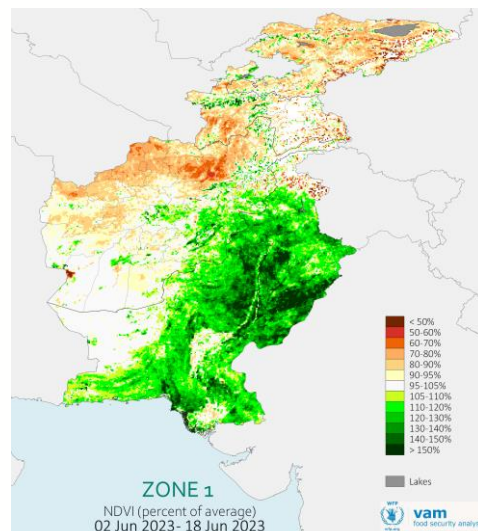
## Vegetation Index

**This zone had below average vegetation index across many countries in recent weeks.**

A below-average vegetation index from 2 to 18 June 2023 was observed in some western and northern parts of Afghanistan, major parts of the Kyrgyz Republic, and Tajikistan.

Above-average vegetation continued in some parts of eastern Afghanistan and major parts of Pakistan (Map 3).

MAP 3: NORMALIZED DIFFERENCE VEGETATION INDEX (NDVI), 2 - 18 JUNE 2023



## Zone 1

### Afghanistan, Kyrgyz Republic, Pakistan, and Tajikistan

#### Crop Production

In **Afghanistan**, harvesting of winter wheat and barley continued in June 2023 and the growing of spring crops (wheat, maize) continued under light rainfall conditions except for the western part, which experienced extreme droughts.<sup>19</sup> If rainfall amounts remain at near-average levels in next coming months, large parts of Afghanistan are likely to see drought conditions with increasing the risk of reduced yields and crop losses. The total 2023/24 cereal production is expected at 4.85 million mt — 6.2 percent lower than the five-year average for 2018-2022. The 2023/24 wheat output is expected at 4.8 million mt, 3.4 percent higher than the five-year average for 2018-2022.<sup>20</sup> An outbreak of Moroccan locusts continued a critical situation in June 2023, and about 35,372 hectares of farmlands in ten provinces have been treated by chemical methods for locust control during January-May 2023.

In the **Kyrgyz Republic**, the harvesting of winter wheat and barley crops began in June 2023 and the planting of spring crops (wheat, maize) continued under drier conditions across the country.<sup>21</sup> The 2023/24 output of wheat is expected at 570,000 mt — 1.8 percent higher than the five-year average for 2018-2022 due to a larger area planted.<sup>22</sup>

In **Pakistan**, winter wheat and barley harvesting continued in June 2023 and the planting of spring crops (maize, rice, sorghum, millet) continued under good weather conditions except for flood-affected areas caused by cyclone Biparjoy.<sup>23</sup> The 2023/24 output of wheat is expected at 26.81 million mt — 4.3 percent higher than the five-year average for 2018-2022 due to the lingering impacts of extensive flooding in 2022.<sup>24</sup>

In **Tajikistan**, the harvesting of winter wheat and barley began in June 2023 and the growing of spring cereals (wheat, barley) continued under drier conditions across the country.<sup>25</sup> The 2023/24 output of wheat is expected at 800,000 mt — 1.8 percent higher than the five-year average for 2018-2022.<sup>26</sup> High risk or threat of current locust infestations to crops was observed in western part, a total of 117,850 hectares of farmlands have been treated chemically to control the locust infestations during January-May 2023.



# Zone 1

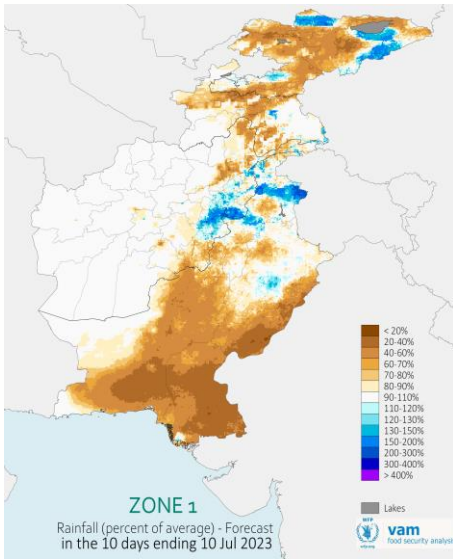
Afghanistan, Kyrgyz Republic, Pakistan, and Tajikistan

## Climate Outlook, July to September 2023

### Drier-than-average-conditions are expected across Zone 1 in the short-term

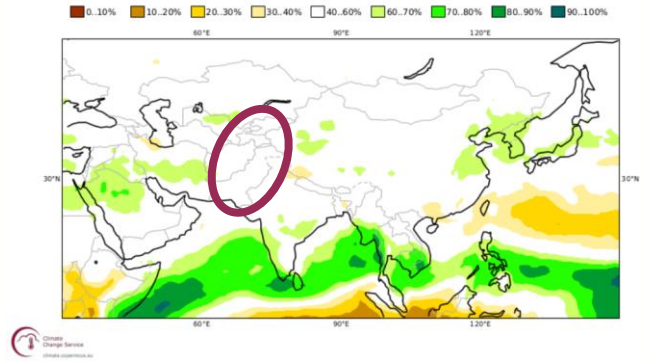
The short-term forecast from 1 to 10 July 2023 (Map 4) shows average to below-average rainfall across major parts of Zone 1. Light rainfall conditions are likely in some parts of eastern Afghanistan, northern and eastern Kyrgyz Republic, northern Pakistan, and eastern Tajikistan.

MAP 4: SHORT-TERM RAINFALL FORECAST AS A PERCENT OF AVERAGE, 1-10 JUL 2023

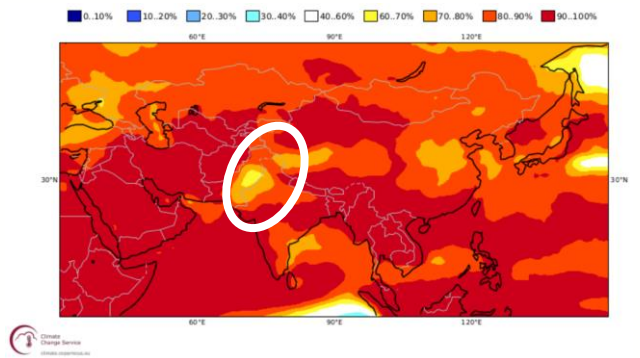


Rainfall during July-September 2023 (Map 5) is likely to be near-average (40-60 percent possibility of exceeding the median rainfall) across Zone 1. During the forecast period, air temperature (Map 6) will likely be above normal across Afghanistan, Kyrgyz Republic, northern and western Pakistan, and Tajikistan (>80 percent possibility of exceeding the median temperature).

MAP 5. LONG-TERM RAINFALL FORECAST JUL-SEP 2023, PRECIPITATION > MEDIAN, %.



MAP 6. LONG TERM TEMPERATURE FORECAST JUL-SEP 2023, 2m TEMPERATURE > MEDIAN, %



Map 6: C3S multi-system seasonal forecast probability (precipitation > median), nominal forecast, ECMWF/Met Office/Meteo-France/CMCC/DWD/NCEP/JMA/ECCC JAS 2023  
 Map 7: C3S multi-system seasonal forecast probability (2m temperature > median), nominal forecast, ECMWF/Met Office/Meteo-France/CMCC/DWD/NCEP/JMA/ECCC JAS 2023

## Zone 2

Bangladesh, Bhutan, Cambodia, India, Lao PDR, Myanmar, Nepal, Philippines, and Sri Lanka

### Rainfall Performance, March-June 2023

**Below-average rainfall in March-June 2023** (Map 7) was observed across major parts of Zone 2, while rainfall was moderate to heavy (> 700 mm of average monthly rainfall) in some parts of the southern Philippines.

Light to moderate rainfall was observed **in 20 May-20 June 2023** in major parts of Zone 2, while heavy rainfall was observed in some parts of eastern Bangladesh, northeastern India, and southern Philippines, (Map 8).

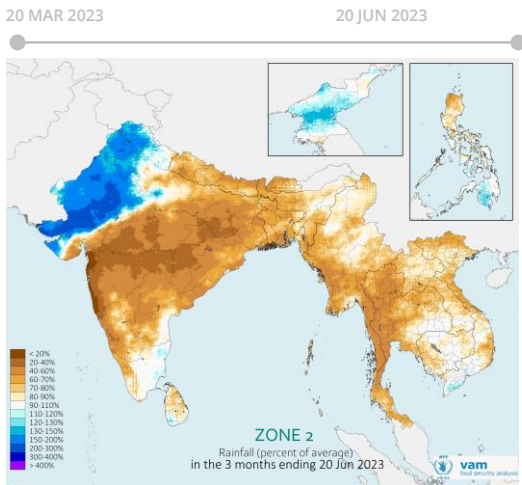
In **Bangladesh**, the heat wave in June 2023 affected people across the country, with thousands of schools closed.<sup>27</sup>

In **India**, Cyclone Biparjoy on 15 June 2023 caused landfills and heavy rains across Gujarat province, at least 6 people died, and about 75,000 people were displaced.<sup>28</sup> Heavy rains in June 2023 caused flash floods in Assam province, as of 21 June, over 119,000 people were affected.<sup>29</sup> While extreme heat wave killed at least 98 people in Bihar State and Uttar Pradesh State.<sup>30</sup>

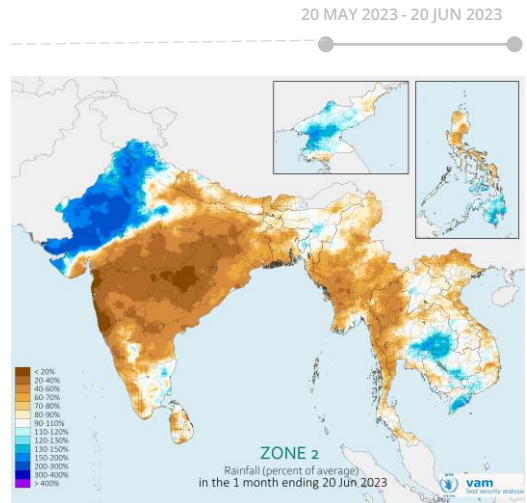
In **Nepal**, heavy monsoon rains caused floods and landslides on 17 June 2023, about 283 households were affected with at least 5 people dead in Koshi province.<sup>31</sup>

In **the Philippines**, heavy rains in June 2023 caused floods in the southern part, 94 households (360 people) in Sultan Kudara province and 2,358 people (786 households) in Davao del Norte province were affected.<sup>32&33</sup>

MAP 7: LAST THREE MONTHS



MAP 8: LAST MONTH



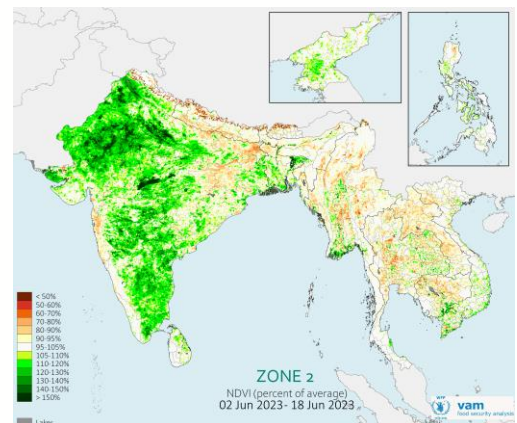
## Vegetation Index

Vegetation index varied greatly in different countries across Zone 2 in recent weeks

An above-average vegetation index for 2-18 June 2023 was observed in major parts of Bangladesh, India, and central Philippines due to above-average rainfall between January-May 2023.

In contrast, below-average vegetation continued in some parts of northern Bhutan, Cambodia, Myanmar, northern Nepal, and Lao PDR due to below-average rainfall and above-average temperature (Map 9).

MAP 9: NORMALIZED DIFFERENCE VEGETATION INDEX (NDVI), 2- 18 June 2023





## Zone 2

Bangladesh, Bhutan, Cambodia, India, Lao PDR, Myanmar, Nepal, Philippines, and Sri Lanka

### Crop Production

In **Bangladesh**, the Aus season rice was in the young panicle forming and flowering stages under good weather conditions in June 2023 except in flood-affected areas caused by Cyclone Mocha.<sup>34</sup> The 2023/24 output of rice is expected at 37 million mt — 4.2 percent higher than the five-year average for 2018-2022 due to expansion in planted areas.<sup>35 & 36</sup>

In **Cambodia**, growing of wet-season rice in June 2023 was in tillering stage to the young panicle forming stage under enough water supply.<sup>37</sup> The 2023/24 output of rice is estimated at 6 million mt — 3.7 percent higher than the five-year average for 2018-2022.<sup>38</sup>

In **India**, planting of Kharif crops (maize, rice, sorghum, and millet) continued in June 2023 under light-to-moderate rains.<sup>39</sup> The 2023/24 output of rice is expected at 134 million tonnes — 7.2 percent higher than the five-year average for 2018-2022.<sup>40</sup>

In **Lao PDR**, the wet-season rice was in the land preparation and seeding stage under good weather conditions with enough irrigation water supply. The 2023 national planting plan for wet-season rice is forecast at 736,000 hectares.<sup>29</sup> The 2023/24 output of rice is estimated at 1.96 million mt — 7.9 percent higher than the five-year average for 2018-2022.<sup>30</sup>

In **Myanmar**, the harvesting of dry-season rice continued in June 2023 and planting of wet-season rice began under good weather conditions, except for flooded affected areas in Rakhine State caused by Cyclone Mocha between 13-14 May 2023, about 1,650 hectares of dry-season rice were damaged.<sup>31</sup> The 2023/24 output of rice is estimated at 12.5 million mt — 0.2 percent lower than the five-year average for 2018-2022.<sup>32</sup>

In **Bhutan**, the growing of main-season maize and rice continued in June 2023 continued under light-to-moderate rains.<sup>33</sup> The 2023/24 output of maize is estimated at 31,000 tonnes, 24.4 percent lower than the five-year average for 2018-2022 due to a reduction in the planted areas and remained stable from the previous year.<sup>34</sup>

In **Nepal**, planting of rice continued in June 2023 under below-average rainfall conditions. As of 6 July 2023, rice has been planted in only 27 percent of the 2023 total planted areas and the planting of maize finished in May. The 2023/24 output of rice is expected at 3.65 million mt — 1.4 percent higher than the five-year average level (2018-2022).<sup>35</sup>

In **the Philippines**, growing of wet-season rice in June 2023 was in tillering to young panicle forming stage under good weather conditions. Typhoon Mawar at the end of May 2023 caused heavy rains and landslides across Luzon and Visayas region, with no crop damage reported in these areas.<sup>36</sup> The 2023/24 output of rice is expected at 12.6 million mt — 2.9 percent higher than the five-year average for 2018-2022.<sup>37</sup>

In **Sri Lanka**, growing of Yala season maize and rice continued in June 2023 under average to slightly below average rainfall conditions.<sup>38</sup> The total 2023/24 output of rice is estimated at 3.06 million mt — 0.4 percent higher than the five-year average for 2018-2022 due to increased planted areas and improved supply of chemical fertilizers.<sup>39</sup>



## Zone 2

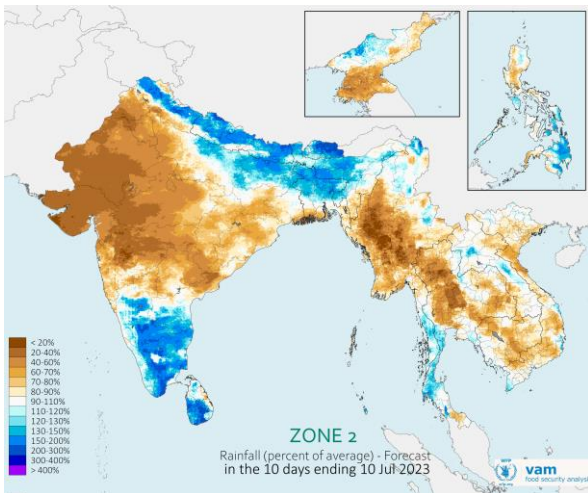
Bangladesh, Bhutan, Cambodia, India, Lao PDR, Myanmar, Nepal, Philippines, and Sri Lanka

### Climate Outlook, July to September 2023

#### Drier-than-average conditions are expected across many countries in the short term

The short-term forecast during 1-10 July 2023 indicates below-average rainfall in western and central India, central Myanmar, and Nepal. In contrast, there is an increased chance of above-average rainfall (150-300 mm of average monthly rainfall) in Bangladesh, northeastern India, northern Myanmar, central and southern Philippines, and southern Sri Lanka (Map 10).

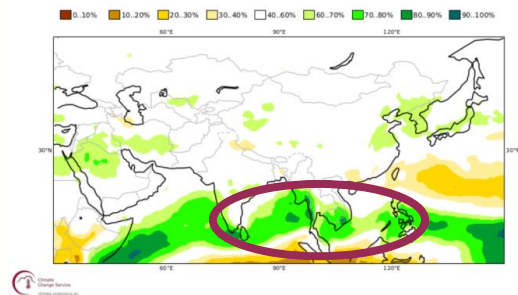
MAP 10: SHORT-TERM RAINFALL FORECAST AS A PERCENT OF AVERAGE, 1-10 JUL 2023



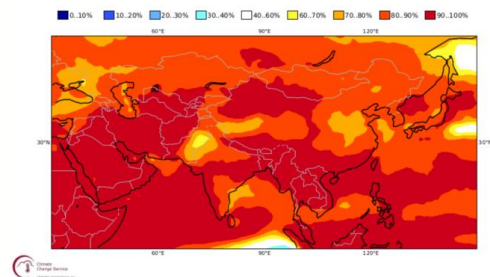
Rainfall during July-September 2023 is likely to be above normal conditions (70-90 percent possibility of exceeding the median rainfall) in Cambodia, southern India, southern Lao PDR, southern Myanmar, and Sri Lanka. Drier conditions with moderate to high risk of drought are projected in northern India, Nepal, and southern Philippines, (Map 11).

Air temperature during July-September 2023 is likely to be above the normal conditions (>80 percent possibility of exceeding the median temperature) across major parts of Zone 2 (Map 12).

MAP 11. LONG-TERM RAINFALL FORECAST JUL-SEP 2023, PRECIPITATION > MEDIAN, %



MAP 12. LONG TERM TEMPERATURE FORECAST JUL-SEP 2023, 2m TEMPERATURE ABOVE MEDIAN, %



Map 13: C3S multi-system seasonal forecast probability (precipitation > median), nominal forecast, ECMWF/Met Office/Meteo-France/CMCC/DWD/NCEP/JMA/ECCC JAS 2023  
 Map 14: C3S multi-system seasonal forecast probability (2m temperature > median), nominal forecast, ECMWF/Met Office/Meteo-France/CMCC/DWD/NCEP/JMA/ECCC JAS 2023

# Zone 3

Fiji, Indonesia, Kiribati, Papua New Guinea, Timor Leste, Tuvalu, Vanuatu

## Rainfall Performance, March-June 2023

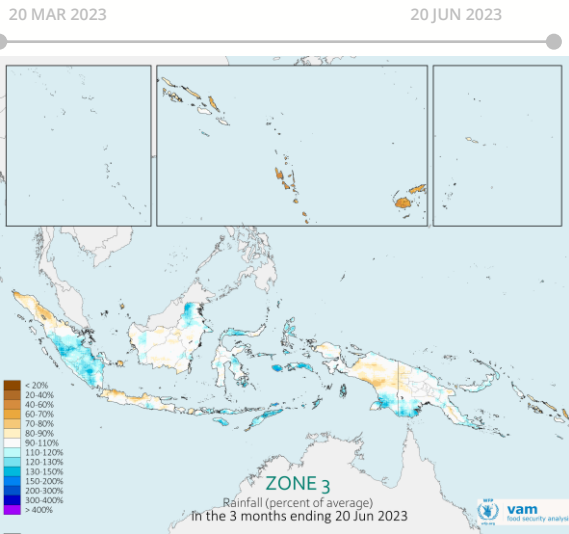
**Rainfall during March-June 2023** was higher than average (500-800 mm of average monthly rainfall) in eastern Fiji, Indonesia, Papua New Guinea, Solomon Islands, and eastern Timor Leste (Map 13).

During **20 May-20 June 2023** (Map 14), above-average rainfall (200-400 mm of average monthly rainfall) continued in central and eastern Indonesia, central and eastern Papua New Guinea, and Solomon Islands.

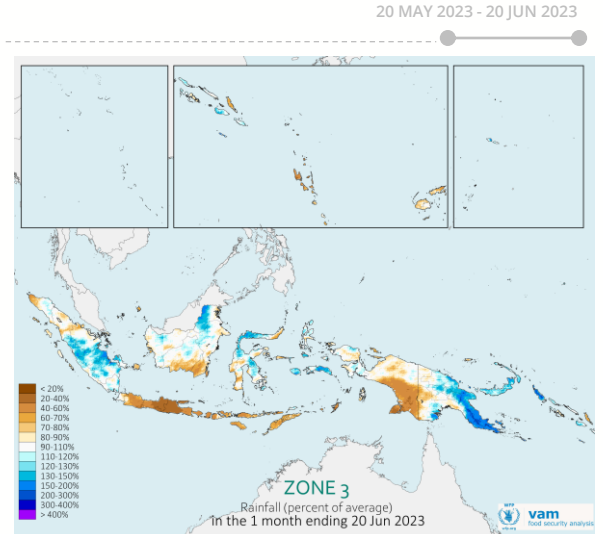
In **Indonesia**, heavy rains in June 2023 caused floods and landslides in western Java, and northern Sulawesi.<sup>40, 41</sup> About 1,600 people (557 households) were affected in South Bolaang Mongondow. While droughts affected about 7,500 people (2,500 households) in Cilacap, Central Java.<sup>42</sup>

In **Samoa**, heavy rains in early June 2023 caused floods and landslides across some parts of Savai'i region, farms were damaged with many households affected.<sup>43</sup>

MAP 13: LAST THREE MONTHS



MAP 14: LAST MONTH

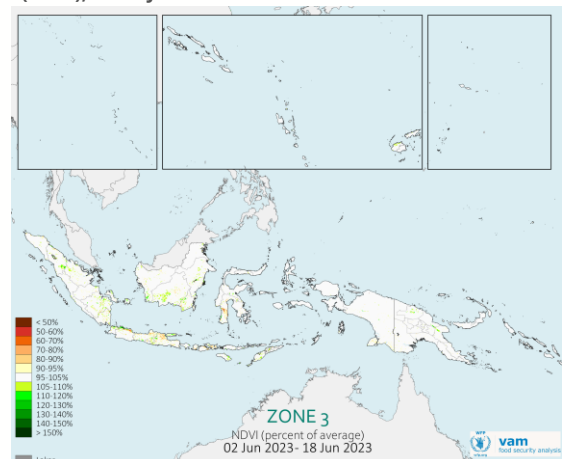


## Vegetation Index

**This zone had an average vegetation index in recent weeks**

Near-average vegetation conditions were observed in most parts of Zone 3 between 2-18 June 2023. Only a few areas in northern Fiji, Indonesia, and Timor-Leste have above-average vegetation conditions as heavy rains during the last three months improved crop growth conditions (Map 15).

MAP 15: NORMALIZED DIFFERENCE VEGETATION INDEX (NDVI), 2 - 18 June 2023



## Zone 3

Fiji, Indonesia, Kiribati, Papua New Guinea, Timor Leste, Tuvalu, Vanuatu

### Crop Production

In **Fiji**, growing of cane continued in June 23 under below-average, average, and above-average rainfall. <sup>44</sup> The 2023 output of rice is estimated at 12,000 tonnes, and the yield is 2.5 tonnes per hectare. About 40,000 tonnes of rice is imported in 2023. <sup>45</sup>

In **Indonesia**, the harvesting of wet-season rice continued in June 2023 and planting of dry-season rice began under good weather conditions and enough irrigation water supply. <sup>46</sup> The 2023/24 rice production is expected at 34 .35 million tons, 0.3 percent higher than the five-year average level for 2018- 2022.<sup>47</sup>

In **Papua New Guinea**, the growing of main food crops (banana, sweet potato, and taro) in June 2023 continued under good weather conditions. <sup>48</sup> The 2023/24 output of palm oil is expected at 800,000 tonnes, 14.3 percent higher than the five-year average level for 2018-2022.<sup>49</sup>

In **Timor-Leste**, the harvesting of main rice and planting of off-season maize continued in June 2023 under drier-than-average conditions. The Ministry of Agriculture and Fisheries reported that the total 2023 output of rice is estimated at 86,000 tonnes, 1.2 percent higher than the previous year. However, the local rice production is not sufficient to meet the domestic consumption needs of 130,000 tonnes for 1.3 million population. <sup>50</sup>



# Zone 3

Fiji, Indonesia, Kiribati, Papua New Guinea, Timor Leste, Tuvalu, Vanuatu

## Climate Outlook, July to September 2023

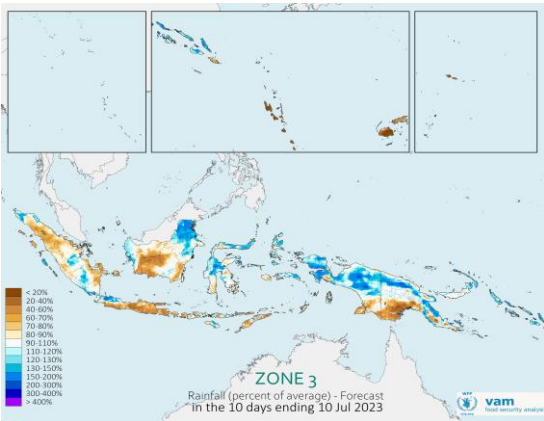
### Drier-than-average conditions are expected across many countries in the short-term

The short-term forecast during 1-10 July 2023 indicates that above-average rainfall (150-300 mm of average monthly rainfall amount) is likely in some parts of Indonesia (northern Kalimantan, central Sulawesi, Papua), northern and eastern Papua New Guinea, and Solomon Islands. (Map 16).

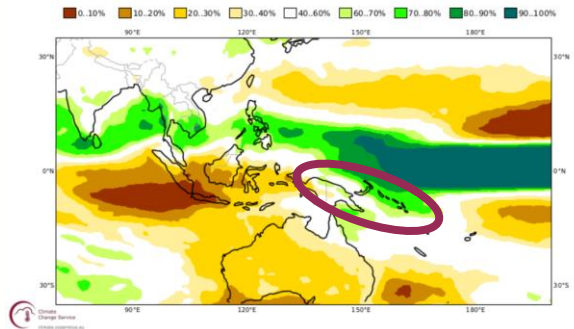
Forecasts for July-September 2023 show above-average rainfall conditions (60-80 percent possibility of exceeding the median rainfall average) in southern and eastern Papua New Guinea, and Solomon Islands. Islands closer to the Equator such as Kiribati and Tuvalu are likely to experience very wetter than average conditions (>90 percent possibility of exceeding the median rainfall average). In contrast, major parts of Indonesia, western Papua New Guinea, and Timor-Leste are likely to experience below-average rainfall (Map 17).

Air temperature during July-September 2023 is likely to be higher than average across this zone (greater than 80 percent possibility of exceeding the median temperature) (Map 18).

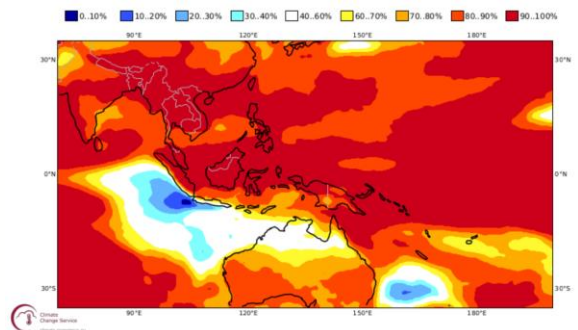
MAP 16: SHORT-TERM RAINFALL FORECAST AS A PERCENT OF AVERAGE, 1-10 JUL 2023



MAP 17. LONG-TERM RAINFALL FORECAST JUL-SEP 2023, PRECIPITATION > MEDIAN, %



MAP 18. LONG-TERM TEMPERATURE FORECAST JUL-SEP 2023, 2m TEMPERATURE ABOVE MEDIAN, %

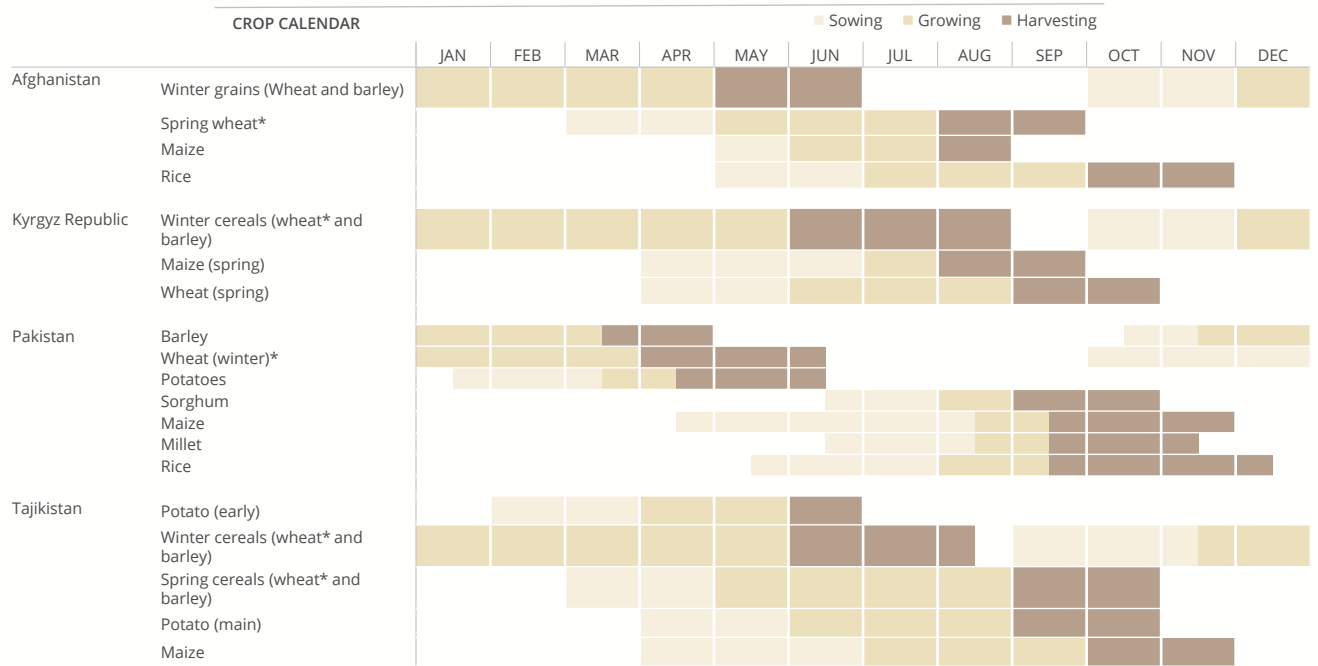


Map 20: C3S multi-system seasonal forecast probability (precipitation > median), nominal forecast, ECMWF/Met Office/Meteo-France/CMCC/DWD/NCEP/JMA/ECCC JAS 2023  
 Map 21: C3S multi-system seasonal forecast probability (2m temperature > median), nominal forecast, ECMWF/Met Office/Meteo-France/CMCC/DWD/NCEP/JMA/ECCC JAS 2023

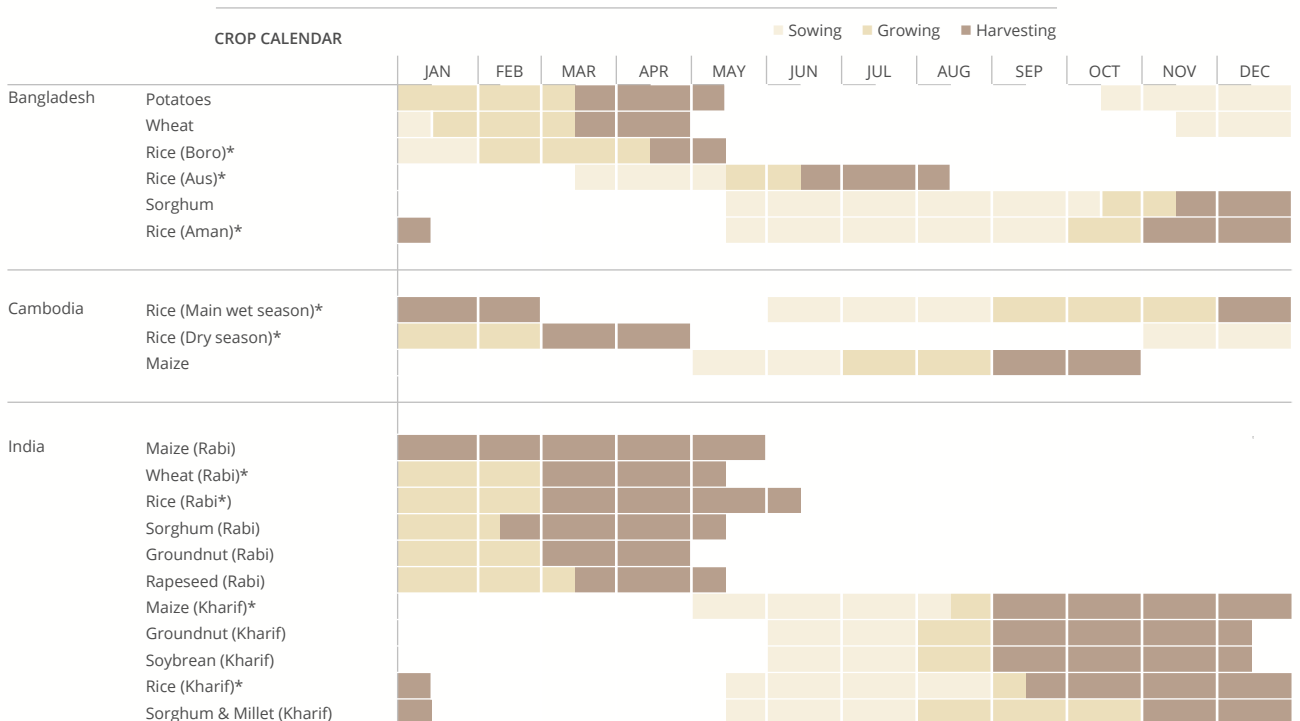
# Annexes

## Crop Calendar

### Zone 1: Afghanistan, Kyrgyz Republic, Pakistan, and Tajikistan



### Zone 2: Bangladesh, Bhutan, Cambodia, India, Lao PDR, Myanmar, Nepal, Philippines, and Sri Lanka

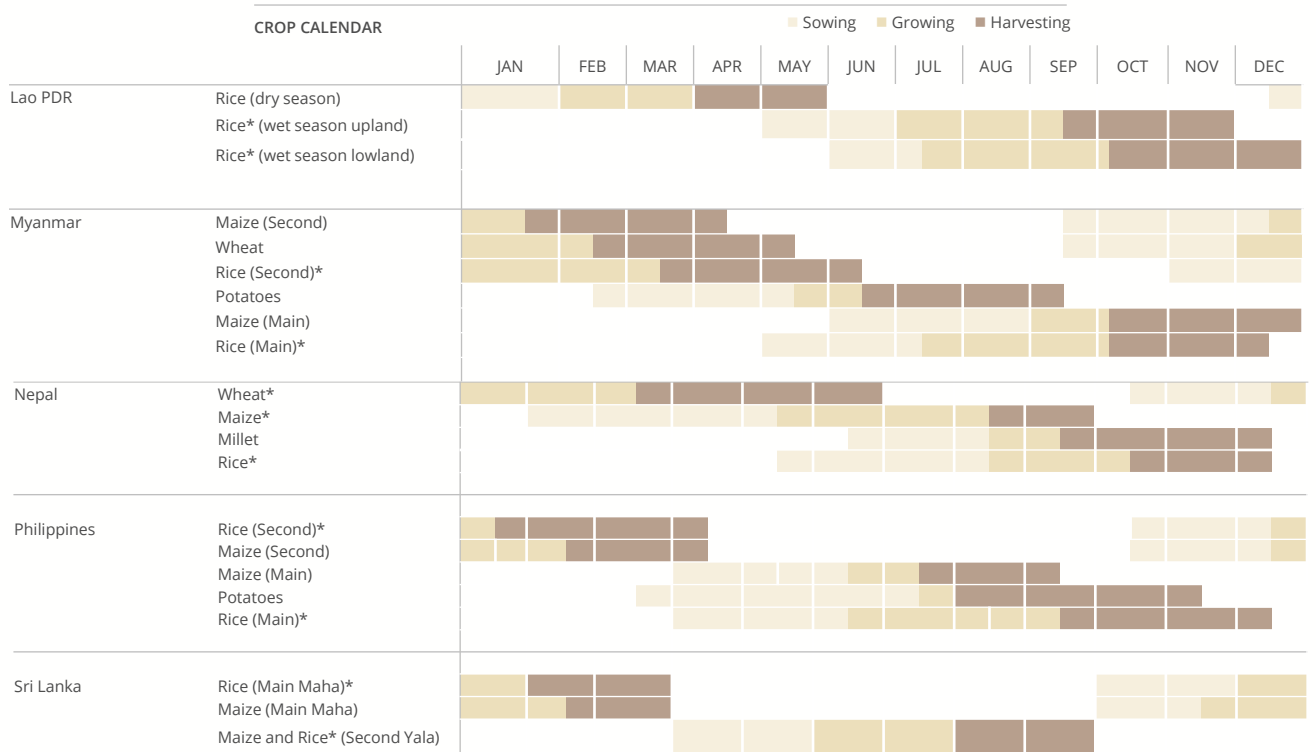


Source: FAO/GIEWS, FEWSNET. Periods are rounded to half-months.

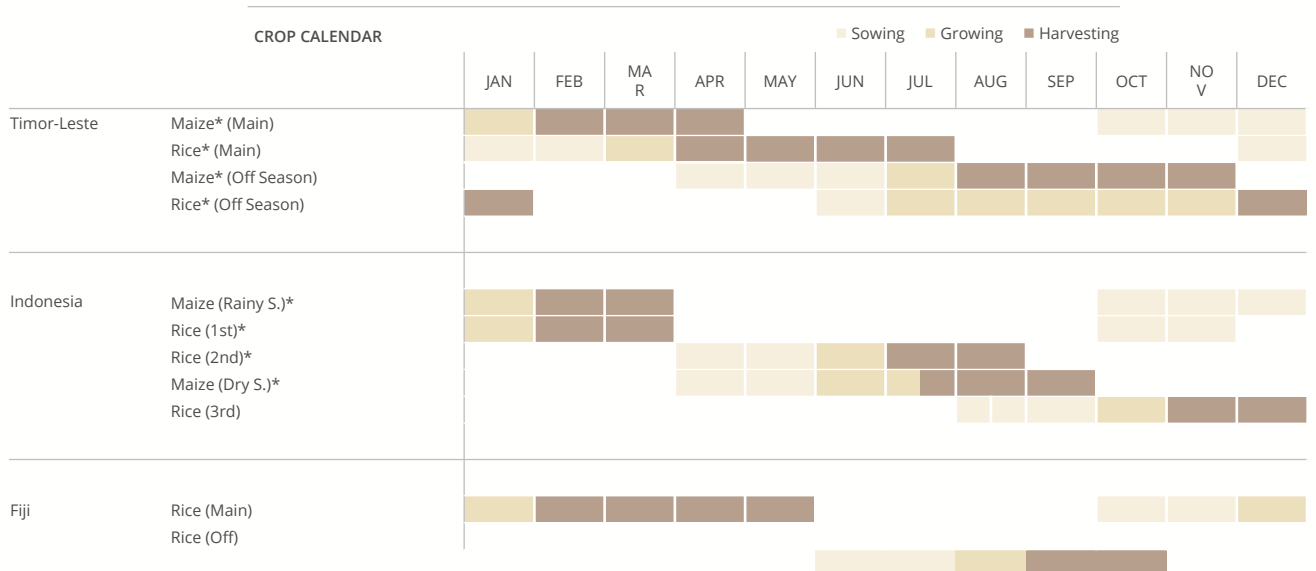
# Annexes

## Crop Calendar

Zone 2: Bangladesh, Bhutan, Cambodia, India, Lao PDR, Myanmar, Nepal, Philippines, and Sri Lanka



Zone 3: Fiji, Indonesia, Kiribati, Papua New Guinea, Timor Leste, Tuvalu, Vanuatu



Source: FAO/GIEWS, WFP CFSAM. Periods are rounded to half-months.

# Annexes

## RBB Countries Rainfall Seasonal Pattern

Year		2023																																				Average annual rainfall (mm)	Accumulative rainfall variation by June 2023(%)	Accumulative rainfall variation by June 2023(mm)
Month	Dekad (ten-day rainfall period)	JAN			FEB			MAR			APR			MAY			JUN			JUL			AUG			SEP			OCT			NOV			DEC					
Zone 1	Afghanistan	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	231.4	-35.29	-20%
	Kyrgyz Republic																																					394.5	-82.09	-37%
	Pakistan																																					227.0	10.41	11%
	Tajikistan																																					323.3	-91.67	-40%
Zone 2	Bangladesh																																				2,330.7	-122.81	-34%	
	Bhutan																																				893.5	-50.73	-34%	
	Cambodia																																				1,964.8	-83.71	-28%	
	India																																				1,098.9	-10.97	-11%	
	Lao PDR																																				1,838.2	-71.21	-24%	
	Myanmar																																				2,090.0	-43.59	-20%	
	Nepal																																				1,384.7	-68.80	-40%	
	Philippines																																				2,251.6	163.82	26%	
	Sri Lanka																																				1,792.5	12.97	2%	
	Zone 3	Fiji																																			2,820.7	-59.99	-5%	
Indonesia																																				2,685.6	83.36	7%		
Timor-Leste																																				1,749.4	27.84	2%		

Data source: [WFP Dataviz Seasonal Explore](#)

- **Very heavy rains, heavy rainfall period.** 10 daily rainfall > 3 times the average 10 daily contribution to annual rainfall.
- **Heavy rains; core rainfall period.** 10 daily rainfall > 2 times the average 10 daily contribution to annual rainfall.
- **Moderate rains; rainfall season.** 10 daily rainfall > 1 to 2 times the average 10 daily contribution to annual rainfall.
- **Light rains; starting/residual rainfall season.** 10 daily rainfall > 0.5 to 1 time the average 10 daily contribution to annual rainfall.
- **Dry season;** 10 daily rainfall <0.5 times the average 10 daily contribution to annual rainfall.

◆ Rainfall > 100 mm

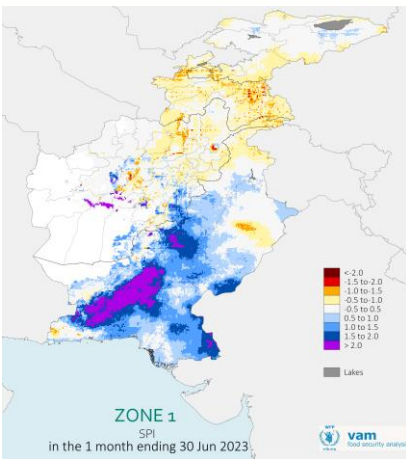


# Annexes

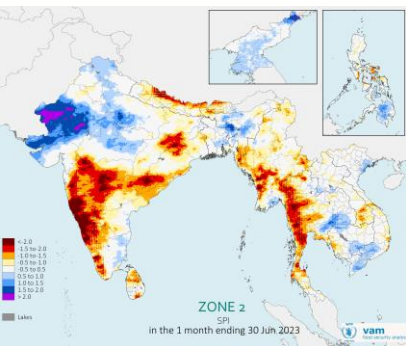
## Standardized Precipitation Index, 1-30 June 2023

The maps (19, 20,21) show last month's standardized precipitation index (SPI). The SPI shows the experience of wet conditions on one or more time scales (blues-dark purple), and dry conditions (yellow-browns) in Asia and the Pacific.

MAP 19: SPI ZONE 1 LAST MONTH



MAP 20: SPI ZONE 2 LAST MONTH



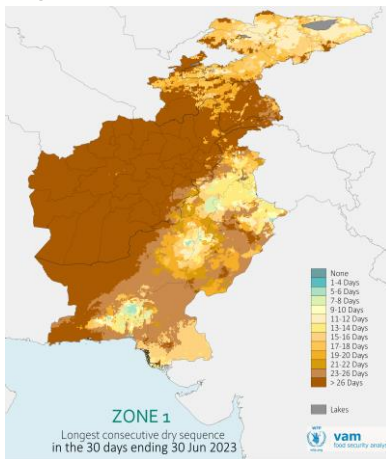
MAP 21: SPI ZONE 3 LAST MONTH



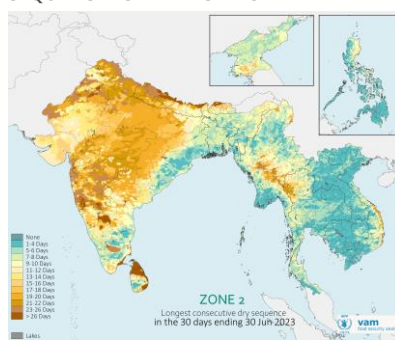
## Longest Consecutive Dry Sequence, 1-30 June 2023

The maps (22, 23,24) show the longest consecutive dry sequence over the past month. Areas in green have experienced shorter dry sequences, while areas in brown have experienced longer ones.

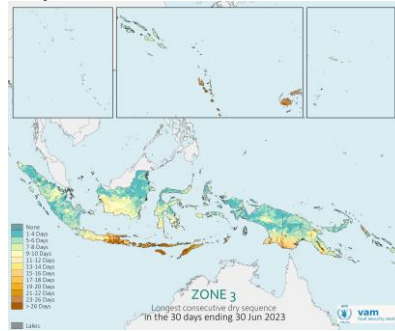
MAP 22: LONGEST CONSECUTIVE DRY SEQUENCE ZONE 1 LAST MONTH



MAP 23: LONGEST CONSECUTIVE DRY SEQUENCE ZONE 2 LAST MONTH



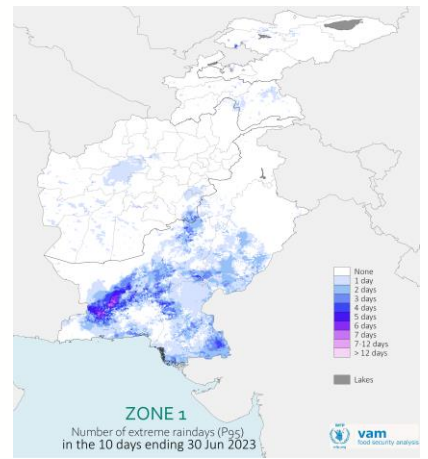
MAP 24: LONGEST CONSECUTIVE DRY SEQUENCE ZONE 3 LAST MONTH



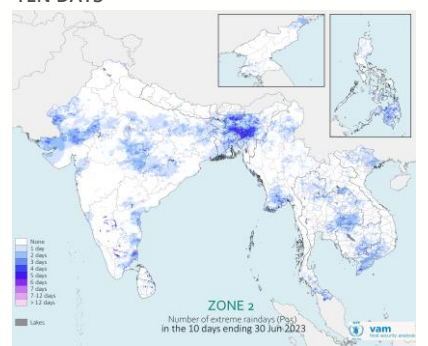
## Extreme Rainfall, 21-30 June 2023

The maps (25, 26,27) show the number of extreme rain days over the last ten days of June in the region. Areas highlighted in dark blue and purple have experienced a high number of intense rain days (defined as days with a 95<sup>th</sup> percentile of rain received) over the last 10 days.

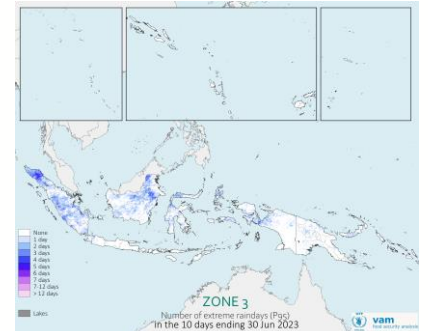
MAP 25: EXTREME RAINFALL ZONE 1 LAST TEN DAYS



MAP 26: EXTREME RAINFALL ZONE 2 LAST TEN DAYS



MAP 27: EXTREME RAINFALL ZONE 3 LAST TEN DAYS



## Sources

### Rainfall time series for trend analysis and seasonal drought monitoring

CHIRPS (Climate Hazards Group InfraRed Precipitation with Station data) gridded rainfall dataset produced by the Climate Hazards Group at the University of California, Santa Barbara:  
(<http://chg.geog.ucsb.edu/data/chirps/>)

### NDVI

MODIS NDVI CMG data made available by NOAA-NASA.  
(<http://reverb.earthdata.nasa.gov/>)

### Seasonal Climate Forecast and ENSO Forecast

International Research Institute for Climate and Society

(<https://iri.columbia.edu/>) **Crop monitoring**

GEOGLAM Crop Monitor (<https://cropmonitor.org/>)

### (Food) Inflation rate and currency exchange

Trading Economics (<https://tradingeconomics.com>)

### Long-term precipitation and temperature forecasts

The Copernicus Climate Change Service  
([https://climate.copernicus.eu/charts/packages/c3s\\_seasonal/](https://climate.copernicus.eu/charts/packages/c3s_seasonal/))

*For more detailed information on seasonal forecast, please visit [Seasonal: Rainfall and Vegetation: Visualizations - Dataviz | WFP - VAM](#)*

**DISCLAIMERS:** All climate content within this bulletin is based upon the most current available remote sensing data.

As the climate phenomena is a dynamic situation, the current realities may differ from what is depicted in this document.

Countries in the region have been classified into three zones according to their geographical location (latitude, longitude) and climate (rainfall and temperature). This classification does not correspond to any official subregions or categories

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