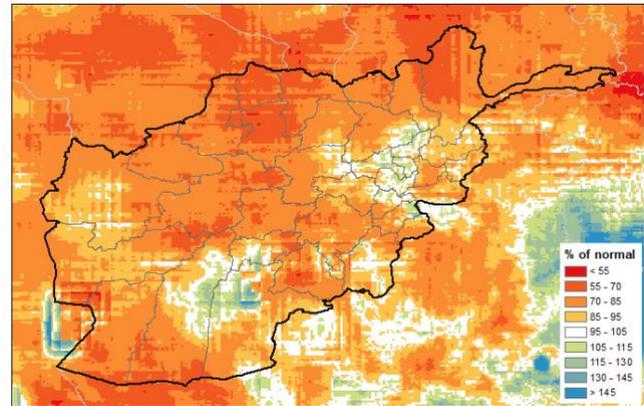


Poor production outcome during current year will worsen food security situation in 2022-23

KEY MESSAGES

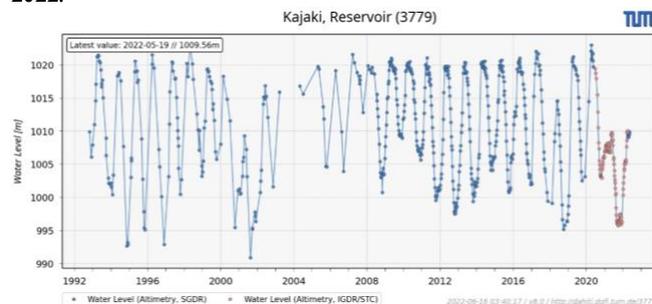
- Cumulative precipitation for the 2021-22 wet season (October 1, 2021 – May 31, 2022) was 55 to 85 percent of normal in the southwestern, northern, central highlands and northeastern parts of the country. Average and above-average cumulative precipitation conditions were observed during the same period in parts of Helmand, Kandahar, and Kabul basins (**Figure 1**), as well as low water levels in many reservoirs in the country (Kajaki Reservoir, **Figure 2**).
- Snow water volumes have been far below average in the northern, northeastern, and eastern basins throughout the 2021-22 wet season. Above-average temperatures led to rapid melt of the meager snowpack, which led to bare ground in some basins at least three weeks earlier than average (**Figure 3**).
- The European Centre for Medium-Range Weather Forecasts (ECMWF) predicts widespread above-average precipitation during the week ending June 27 which is likely to help in land preparation for planting second season crops. Dry weather is expected in the following week ending July 4 (**Figure 4**).
- Forecast of above-average temperatures (**Figure 5**) through the end of the second season, along with low water availability, will limit the second crop cultivation.
- Forecasts of below-average precipitation in late 2022 and early 2023 associated with the anticipated third successive *La Niña*, along with above-average temperatures and low reservoir levels, is likely to create adverse conditions for the upcoming 2022-23 agricultural season.
- Wheat production outlook for 2021-22 is most likely poor in terms of both magnitude and area in more provinces when compared to 2020-21 (**Figure 6**). Below-average precipitation through the end of December 2021 led to reduced winter wheat planted area; below-average precipitation during April when wheat was in flowering stage led to below-normal yields, and both combined result in a poor outlook of wheat production during the current year.

Figure 1: October 1, 2021 – May 31, 2022, percent of cumulative precipitation from CHIRPS with respect to 1981-2010 average.



Source: USGS/UCSB

Figure 2: Time series of Kajaki reservoir water levels as of May 19, 2022.



Source: Database for hydrological Time Series of Inland Waters.

UPDATE ON SEASONAL PROGRESS

Current conditions:

Meteorological, agricultural, and hydrological droughts persist for the second successive year. Low water availability conditions prevail across the country because of below-average seasonal precipitation (**Figure 1**) and low levels in the reservoirs (**Figure 2**). Snow water volume levels in Hari Rod, Kabul, Kunduz, and Panj basins have been at record lows for many months (**Figure 3**). Wheat harvest is in progress with poor wheat production outlook this year (**Figure 6**).

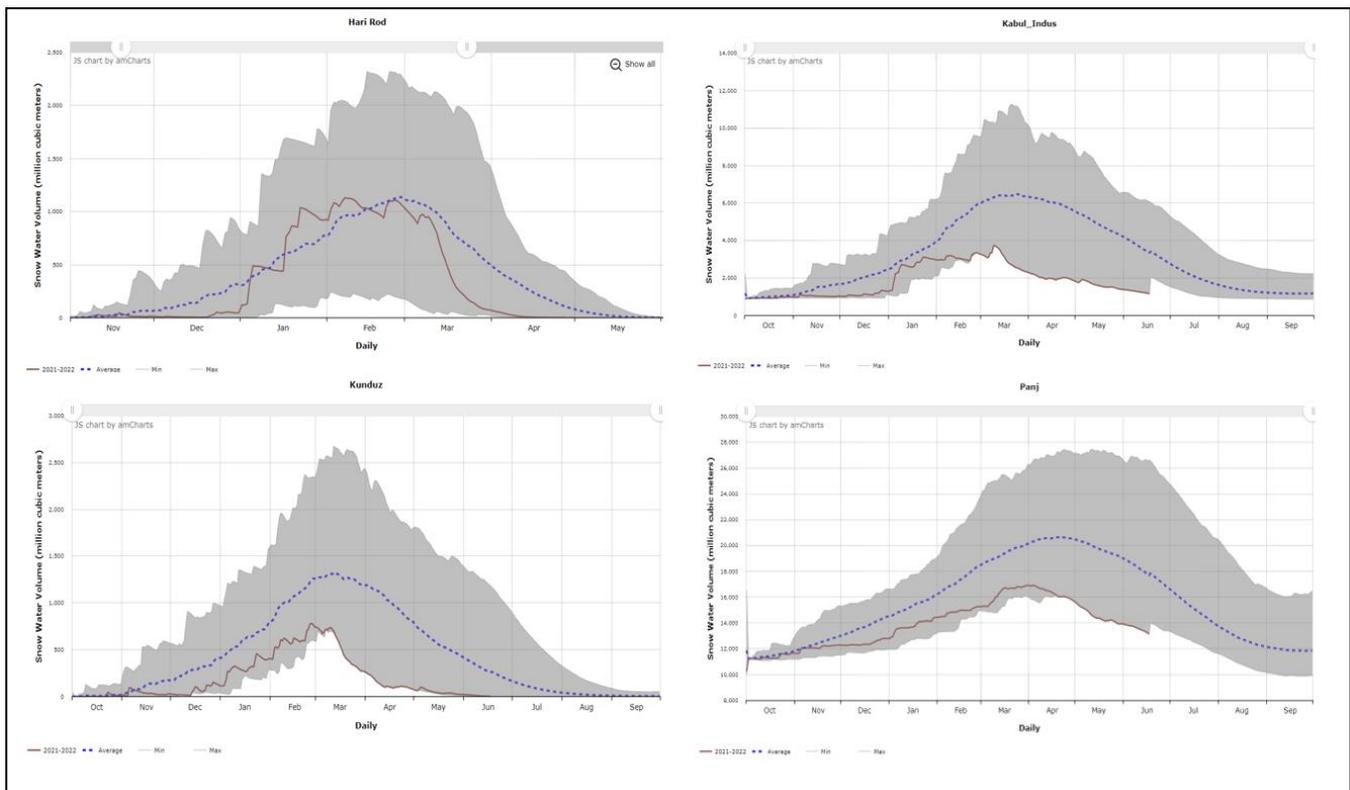
Precipitation anomalies:

Some areas of the northern and northeastern parts of the country bordering Turkmenistan, Uzbekistan, and Tajikistan, and southern parts bordering Pakistan, have received 55 to 70 percent of average cumulative precipitation from October 2021 to May 2022. The Central highlands received 55-85 percent of average cumulative precipitation during the same period. Above-average precipitation (105 to 115 percent of average) was observed in parts of Helmand, Kandahar, and Kabul basins (**Figure 1**). Temporal variability in precipitation played a critical part in lowering the wheat production in the country this year – (i) below-average cumulative precipitation through the end of December 2021 led to below-average planted area, and (ii) below-average precipitation during flowering stage of wheat during April led to below-average yields.

Snowpack and snow water volume:

Snowpack development has been weak throughout the 2021-22 winter season. Rapid depletion of snow water volumes was observed in all the basins from mid-March onwards. Snow water volumes with full depletion profiles reached zero in April, at least 2-3 weeks earlier than average (**Figure 3**). As of June 18, record minimum snow water volumes are seen in Panj, Kokcha-Ab-I-Rustaq, Khanabad, Kunduz, and Kabul basins. [Low reservoir levels will reduce water availability](#) and are likely to severely restrict second crop cultivation in the coming months.

Figure 3. Comparison of seasonal snow water volume (brown line) and historical average (blue dashed line) during 2021-22 in the Hari Rod, Kabul, Kunduz, and Panj basins as on June 18.



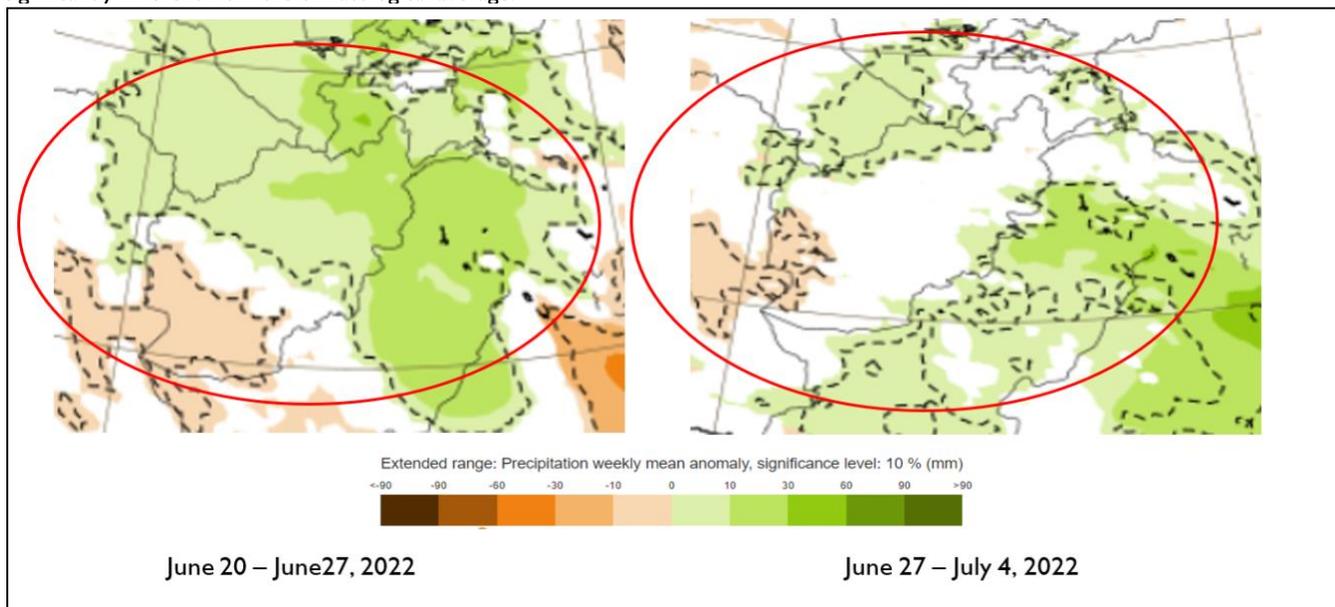
Source: USGS/NASA

FORECAST

Precipitation:

Based on ECMWF forecasts, widespread above-average precipitation is most likely in the northern, northeastern, eastern, central, and southern parts of the country from June 20 through June 27. Although this above-average precipitation may be useful in land preparation of planting second season crops, it is not expected to significantly improve low water availability conditions currently prevailing in the country. Heavy rains also contribute to flash flooding in localized areas. In the second forecast period, dry weather conditions are likely to prevail across the country from June 27 through July 4 (Figure 4). Precipitation is expected to be below average until the end of the second season, given the forecast persistence of La Niña.

Figure 4. Mean weekly precipitation anomalies from ECMWF made on June 18, for (left) June 20 – 27, and (right) June 27 – July 4. The dashed lines indicate precipitation anomalies that are significant at the 1 percent confidence level while the color shaded areas indicate precipitation anomalies that are significant at the 10 percent confidence level. White shading indicates precipitation anomalies that are not significantly different from the climatological average.



Source: ECMWF

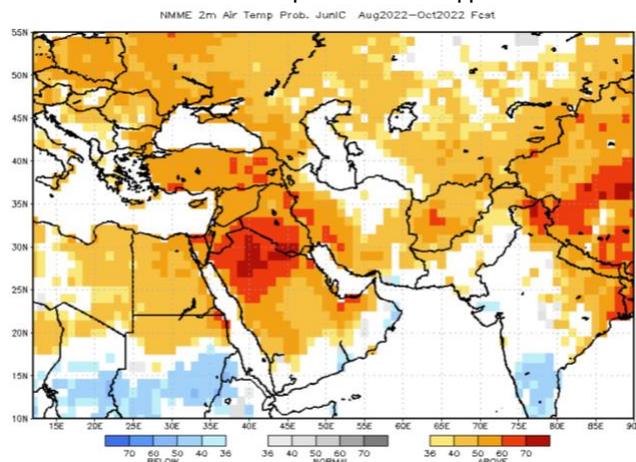
Temperatures:

The North American Multi-Model Ensemble temperature forecast for Aug – Oct 2022 indicates a high probability of above-average temperatures across the country during the forecast period (Figure 5). Normal intensity of second season crop cultivation appears less likely in view of low water availability and above-average temperature forecast during the coming months.

Wheat production losses:

Drought-induced losses in crop production consist of two components: firstly, due to reduction in total sown area caused by lack of sufficient precipitation during sowing period, and secondly, due to below-normal crop yields on account of poor health caused by moisture stress during its critical flowering and grain hardening stages.

Figure 5. The North American Multi-Model Ensemble (NMME) temperature tercile probability forecast for Aug-Oct 2022. Warm colors indicate the likelihood of temperature in the upper tercile.



Source: NOAA CPC

Reduction in sown area was estimated based on the normalized difference aridity index (NDAI) difference between current season and that of a normal season. NDAI has been determined using the formula $(PET - Precipitation) / (PET + Precipitation)$ where PET represents potential evapotranspiration¹ while CHIRPS provides precipitation. Loss in wheat production due to below-average health during crop flowering stage was determined based on the difference between eVIIRS NDVI at flowering stage from mean NDVI (2012-2021).

Figure 6. Comparison of spatial variability in estimated wheat production losses during 2021 and 2022 in Afghanistan. Loss in total wheat production for 2021 and 2022 is expressed relative to the most recent moving 5-year average (2016-2020) wheat production, excluding wheat production for 2018. Normally, a 5-year average excludes abnormally low value in its computation.

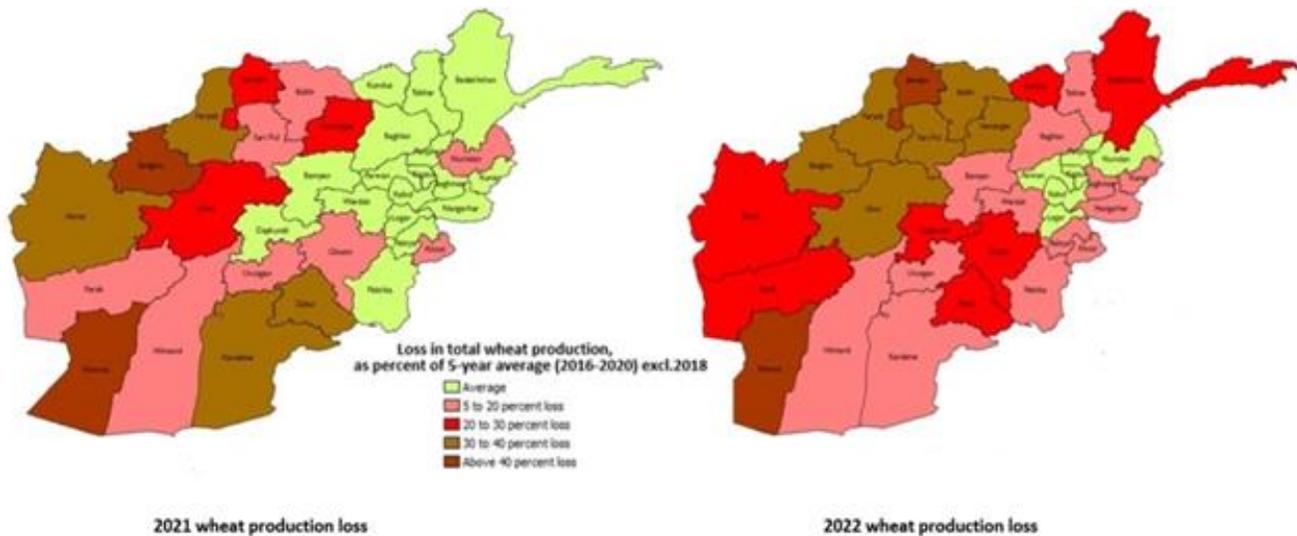


Figure 6 indicates that successive droughts in 2021 and 2022 most likely increased wheat production losses from year to year. Provinces with average wheat production (colored in green) have reduced in number in 2022. On the other hand, wheat production losses in Badghis, Ghor, and Sari Pul are estimated to have increased from 5-30 percent in 2021 to 30-40 percent below average; loss in Ghazni in the south is estimated to have increased from 5-20 percent in 2021 to 20-30 percent below average; and losses in Dayakundi in the central and Badakhshan in the east are estimated to have increased from average to 20-30 percent below average in 2022 because of persistent increase in drought severity in these regions (**Figures 1 and 2**). It is also important to note that wheat production losses in Jawzjan and Nimroz are most likely to exceed more than 40 percent of average in 2022. The anticipated third successive *La Niña* and low reservoir levels to-date may adversely impact the upcoming 2022-23 agricultural season in the country.

¹ Hobbins, M. T. The variability of ASCE Standardized Reference Evapotranspiration: A rigorous, CONUS-wide decomposition and attribution. Transactions of the ASABE 59, 561–576, doi:10.13031/trans.59.10975 (2016).