GDO Analytical Report

Drought in Southern Africa – August 2019

JRC Global Drought Observatory (GDO) and ERCC Analytical Team

14/08/2019

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Executive summary – update to August 2019

This document builds on the previous reports published in January[1] and March[2] 2019, please refer to them for more insight on the precipitation pattern that led to the drought and earlier reported impacts.

- Since March 2019, the drought persisted or worsened almost everywhere, while entering the dry season around May.
- With August marking the peak of the dry season, the exposed population must endure a dire situation for at least another couple of months before rainfall, while food security will remain in jeopardy until at least the next harvest, several months ahead. Food security concerns are widespread to all countries involved, with some open crisis where drought combined with other issues, such as floods and economic downturns (e.g. Zimbabwe, Mozambique).
- Due to the strong seasonality, relevant precipitation are not expected anywhere before late September or October. Indeed, the rainfall outlook matches with the long-term averages, with the exception of some coastal regions of Namibia and South Africa, forecasted as drier than usual.

[1] http://edo-stg.ies.jrc.it/documents/news/GDODroughtNews201901_SouthernAfrica.pdf
[2] http://edo.jrc.ec.europa.eu/documents/news/GDODroughtNews201903_SouthernAfrica.pdf

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Precipitation

Figure 1 shows precipitation for five selected points, from July 2018 to July 2019, and their long-term average respectively. Across southern Africa, despite regional variations, the wet season was largely underwhelming. The months with excess rainfall did not nearly compensate the cumulative deficit before and after.

August marks the peak of the dry season and significant precipitation are not expected anywhere before late September or October.

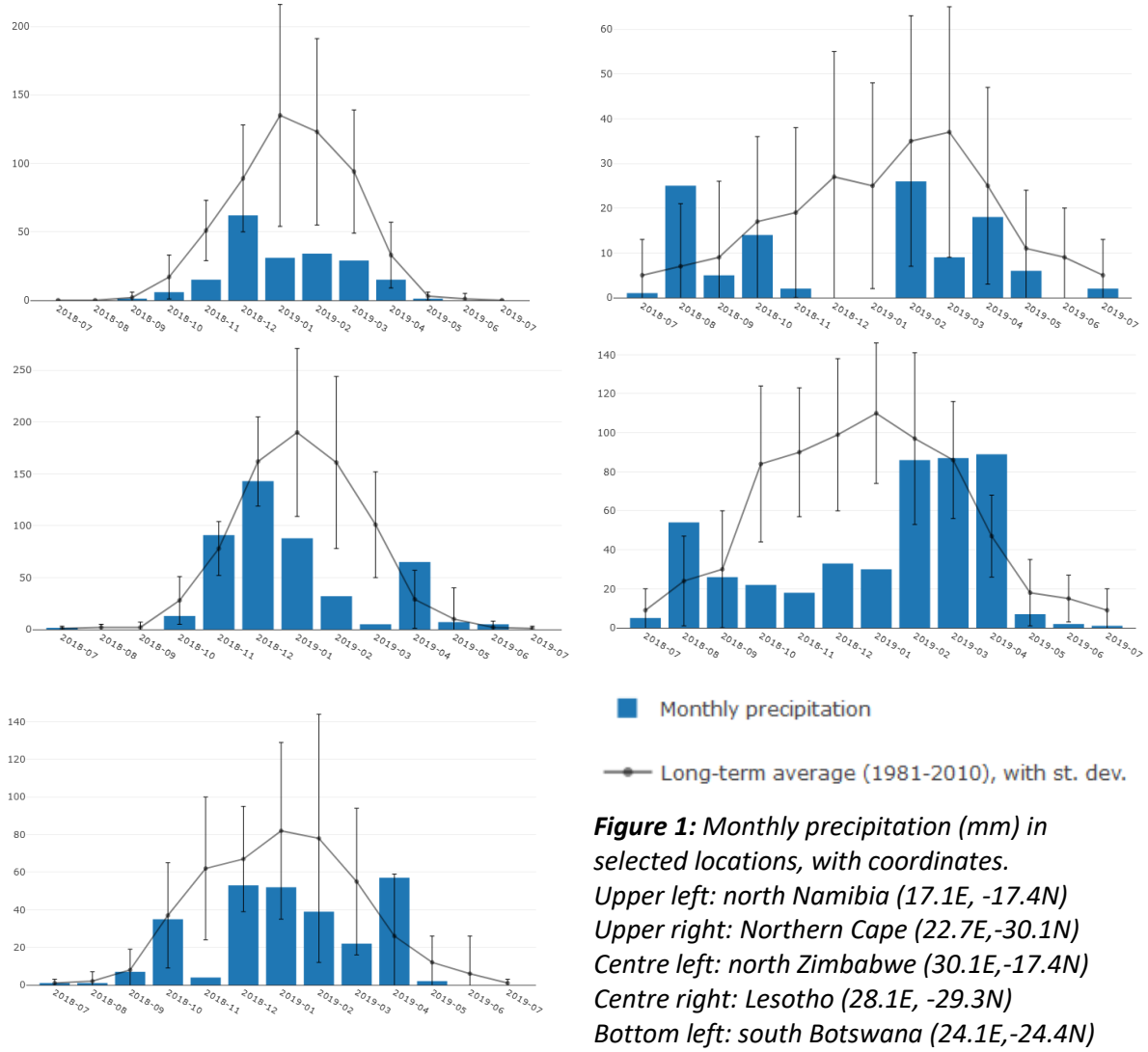

Figure 1: *Monthly precipitation (mm) in selected locations, with coordinates.*
Upper left: north Namibia (17.1E, -17.4N)
Upper right: Northern Cape (22.7E,-30.1N)
Centre left: north Zimbabwe (30.1E,-17.4N)
Centre right: Lesotho (28.1E, -29.3N)
Bottom left: south Botswana (24.1E,-24.4N)

Standardized Precipitation Index (SPI)

The SPI indicator is used to monitor the occurrence of meteorological drought. The lower (i.e. more negative) the SPI, the more intense is the drought.

Compared to the dry trimester between December 2018 and February 2019, February to April 2019 recorded scanty rainfall only in limited areas of southern Africa (parts of Namibia, Zimbabwe and neighboring regions of Mozambique and Botswana)[3]. Elsewhere, the second half of the rainy season accumulated normal precipitation overall, or above average (figure 2, left). In central Mozambique and surroundings, including parts of north-east Zimbabwe, the excess of rain is related to the precipitation during Idai cyclone of March[4]. As a consequence, these areas suffered drought, wind storms and flooding within the same season.

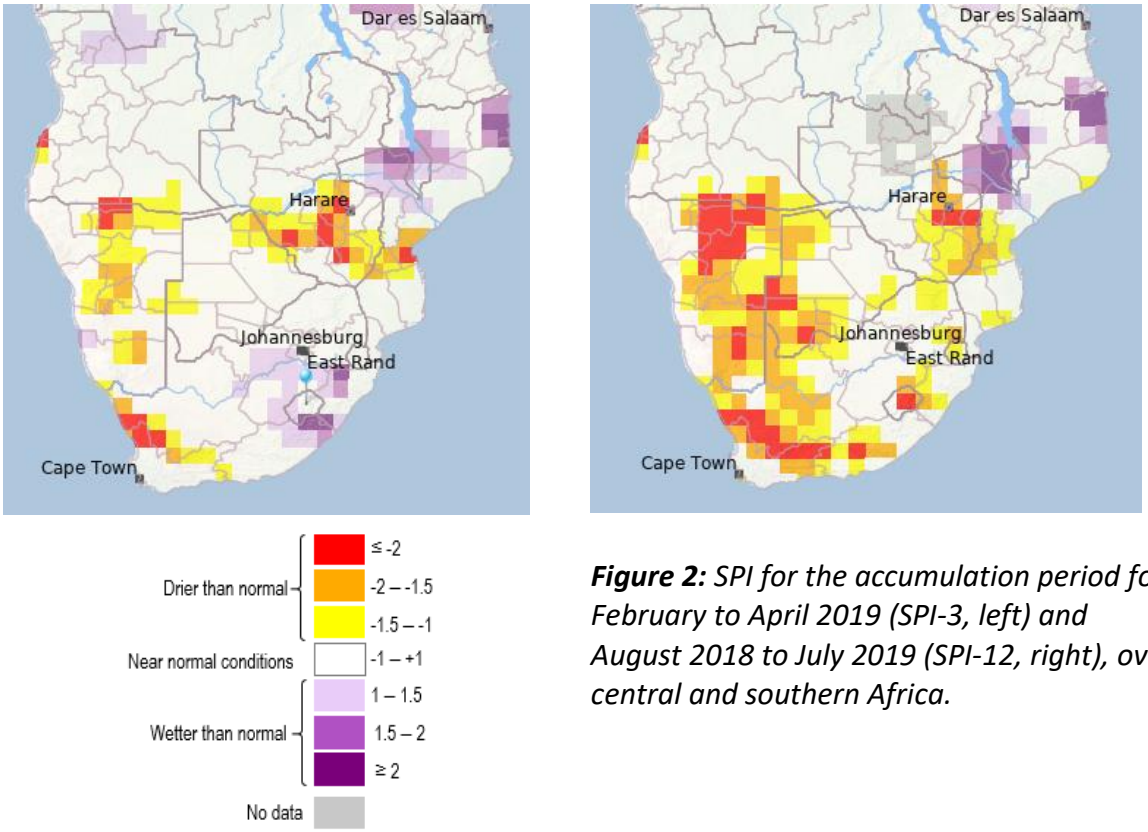

Figure 2: *SPI for the accumulation period for February to April 2019 (SPI-3, left) and August 2018 to July 2019 (SPI-12, right), over central and southern Africa.*

Despite a normal second half of season, the SPI over a cumulative interval of one year (figure 2, right) reveals the scale of persisting meteorological drought, affecting most of the western

[3] The low SPI values in south-west South Africa are of less meaning, as the same trimester is relatively dry according to the long term average, i.e. the precipitation pattern there is opposite of the rest of southern Africa.

[4] http://www.gdacs.org/report.aspx?eventtype=TC&eventid=1000552

half of the sub-continental area, plus eastern Zimbabwe and Lesotho. In fact, February to April did not compensate cumulated deficit over the previous year and a half.

The rainfall anomaly outlook for August and August to October (not shown) matches with the long-term averages, meaning a minor fraction of yearly rainfall only. Some of the coastal regions of Namibia and South Africa are forecasted even drier than usual.

fAPAR anomaly

The fraction of Absorbed Photosynthetically Active Radiation (fAPAR) represents the fraction of the solar energy absorbed by leaves. fAPAR anomalies, specifically the negative deviations from the long term average over the same period, are a good indicator of drought impacts on vegetation.

Vegetation stress at the end of April 2019 largely overlaps with the meteorological drought detected by SPI-12 over most of the affected areas (Figure 3, left). Three months later, it remains substantially unchanged in the spatial distribution, but with an apparent milder severity (Figure 3, left).

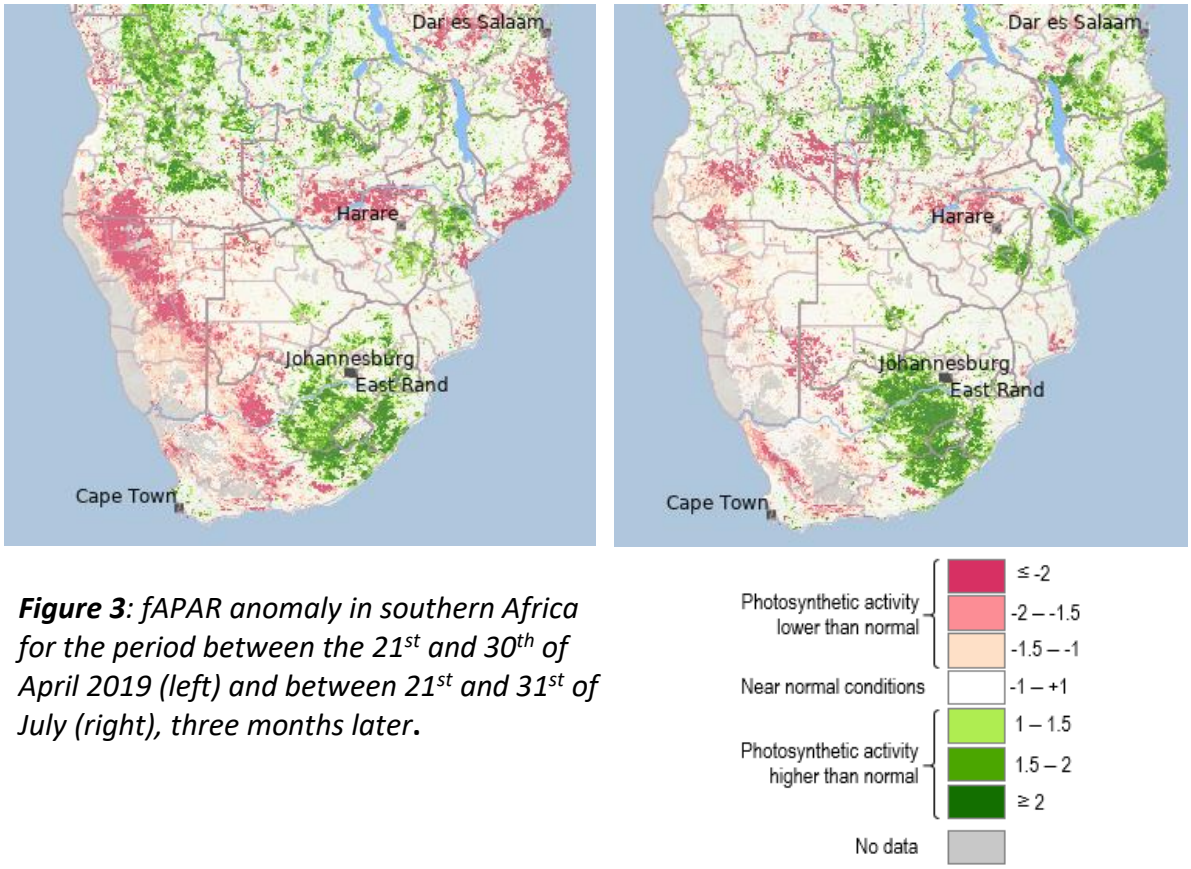

***Figure 3**: fAPAR anomaly in southern Africa for the period between the 21st and 30th of April 2019 (left) and between 21st and 31st of July (right), three months later.*

Soil moisture anomaly

The aim of this indicator is to provide an assessment of the top soil water content, which is a direct measure of drought conditions, specifically the difficulty for plants to extract water from the soil.

Compared to the first trimester of 2019, soil moisture anomaly deepened first in the western half of southern Africa (figure 4, left), then extended over the other half throughout April to July 2019 (figure 4, right). Soil moisture anomalies mirror the cumulative rainfall deficits (and surplus) recorded over not just the 2019 wet season, but since the beginning of 2018. All areas but central South Africa and central and northern Mozambique now display drier soils than usual for this time of the year.

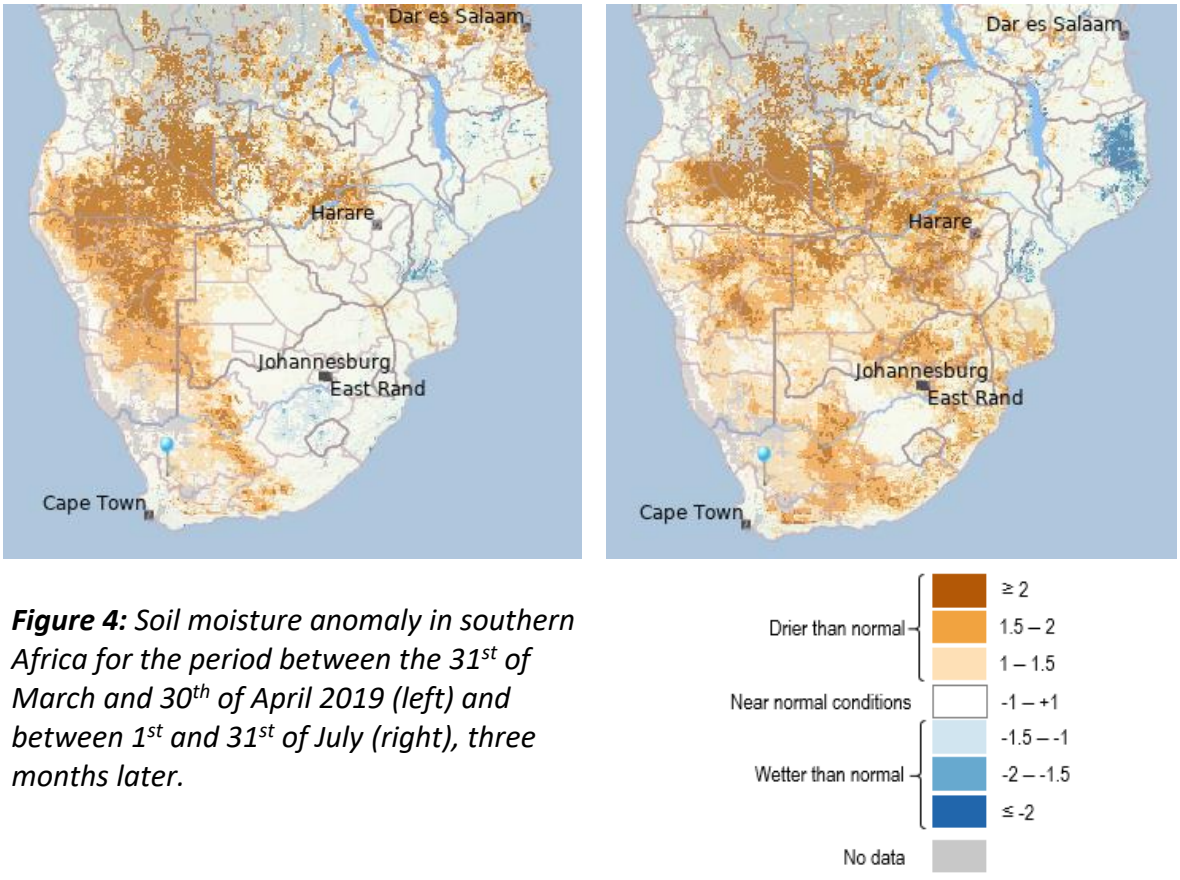

Figure 4: *Soil moisture anomaly in southern Africa for the period between the 31st of March and 30th of April 2019 (left) and between 1st and 31st of July (right), three months later.*

Reported impacts

In-depth reports have been published concerning food security and related issues, including drought, by the Southern African Development Community (SADC)[6] and by the World Food Program[7]. Please refer to those for details about the humanitarian situation on the ground and the needs for the next few months. As of July 2019, Zimbabwe government declared food emergency at national scale[8]. The floods caused by hurrican Idai during March 2019 damaged harvests in Zimbabwe, Monzambique and neighboring regions, enhancing the risks for food security, especially in those areas already affected by drought.

***Distribution**: for ERCC and related partners use.*

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6 https://reliefweb.int/sites/reliefweb.int/files/resources/SADC_2019_Synthesis_Report_on_the_State_of_Food_and_Nutrition_Security_and_Vulnerability_in_Southern_Africa.pdf
7 https://reliefweb.int/sites/reliefweb.int/files/resources/WFP-0000106747.pdf
8 https://reliefweb.int/sites/reliefweb.int/files/resources/ROSEA_Zimbabwe_HumanitarianAppealRevision_06082019.pdf