Drought in Angola – February 2021 JRC Global Drought Observatory (GDO) and ERCC Analytical Team 18/03/2021



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Executive summary

- A strong dry spell is hampering the rainy season 2020/21 and the hydrological year in Angola, and especially the south-west provinces. Despite the normal precipitation at the onset of the season, January and February brought less than half of the long-term average for the period, which accounts for 40% of the total annual precipitation.
- Reportedly, the humanitarian situation is dire: people are fleeing the most affected areas and food security issues are spreading. The drought hit at the core of the growing season, so major damages to crops and rangelands are occurring.
- The precipitation outlook until May 2021 is neutral or slightly negative over the most affected areas at present, and clearly negative for the neighboring regions to the east and south. With March usually being the wettest month of the year and in absence of above-average precipitation, the situation on the ground is therefore not going to improve for many months ahead.

Risk of drought impact for agriculture (RDrI-Agri)

The indicator RDrI-Agri shows the risk of having impacts from a drought, by considering the exposure and socio-economic vulnerability of the area, with particular focus to the agricultural impacts.

For reference, a map of the provinces of Angola is provided in Figure 8 at the end of the report.

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Figure 1 shows most of Angola exposed to some level of risk, especially the south-west and across to the north-east. About two million people live in the area of highest risk at present and half of all Angolans are under moderate risk. About 40% of national cereal production comes from the provinces of Huambo and Huila alone and both are amongst the most affected by the current drought, which hits at the core of the growing season¹. The majority of population is employed in small-scale agriculture, with no access to modern agronomic technologies and irrigation. Poverty is widespread and food security is a common concern. The south-west was affected by intense drought already in 2015-16, after years of poor precipitation, and between one and two million people were impacted severely². Dry conditions were experienced again later at the end of 2019³. The southern provinces are thus exposed chronically to drought which, in addition to the national socio-economic issues, minimizes the coping and recovery capacity of population and the local economy. Eastern Angola, despite the extreme deficits accumulated since December, has a relatively lower risk, since it is sparsely populated and less agricultural land is exposed.

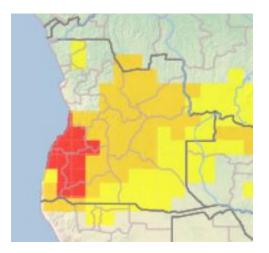




Figure 1: Risk of drought impact for agriculture (RDrI-Agri) over Angola from 1st to 10th of March 2021.

Precipitation

Central and southern Angola has a very dry season between May and September, followed by a wet season that peaks between December and February. In late 2020, the start of the season was slightly below average for the south and above for the centre. However, from December 2020 onwards, the weather resulted much drier: half or less of the normal rainfall for the period fell (Figure 2). As of February 2021, the accumulated deficit ranges between 10 and 25% of the

¹ http://inamet.gov.ao/ao/boletim-agrometeorologico/

² https://ec.europa.eu/fpi/sites/fpi/files/pdna/pdna_-angola_2016_-_report_1.pdf

³ https://edo.jrc.ec.europa.eu/documents/news/GDODroughtNews201910_Southern_Angola.pdf

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yearly total, depending on location, but considering only the current rainy season it stands between 35% of Huambo and a 50% of Cunene, over a period of six months. Considering the extreme seasonality of rainfall in the south, receiving up to 80% of the total annual rainfall between December and March, it is likely that the gap will not be filled before the next rainy season.

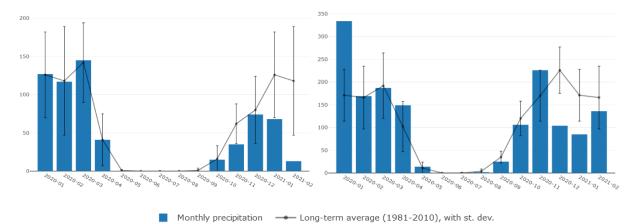


Figure 2: Monthly total precipitation in southern Angola (left chart; Cunene, -16.5 N, 14.0 E) and central Angola (right; Huambo, -12.2 N, 15.9 E), with the long-term monthly averages (1981-2010).

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 past, the current meteorological drought is not as extreme as others before in the southwestern provinces; despite its intensity, it lasted only a few months so far. On the six months scale, encompassing the whole rainy season before March, the most affected areas do not record particularly low values yet, thanks primarily to the normal onset of seasonal rainfall (Figure 3, right). On the contrary, eastern Angola shows extreme values, as well as Benguela and eastern Cunene. Looking at the trimester December-February, the core of the rainy season, the SPI reaches much lower values in the southwest too, in relation to the scant precipitation during February 2021 (Figure 3, left).

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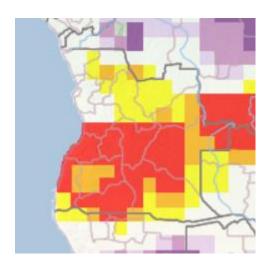
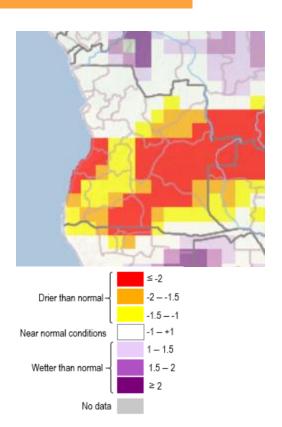


Figure 3: SPI for February 2021 with a cumulative period of three months (SPI-3, left) and six months (SPI-6, right).



Indeed, the time-series of figure 4 (top) displays the dynamic of the dry spell, a picture common to the whole south-western Angola. After many months of average rainfall, a sudden drop in the index indicates the key role of the January and February 2021, even at the yearly time scale (Figure 4, middle). The figure of SPI-12 from eastern Angola is much more extreme, reaching absolute lows for the whole time-series since 1971 (Figure 4, bottom). It should be noted that the other indicators do not fully support such outstanding values; precipitation data are sparse and sometimes unreliable in this part of the world and, despite a severe precipitation deficit is undeniable, it may not be as extreme as it appears.

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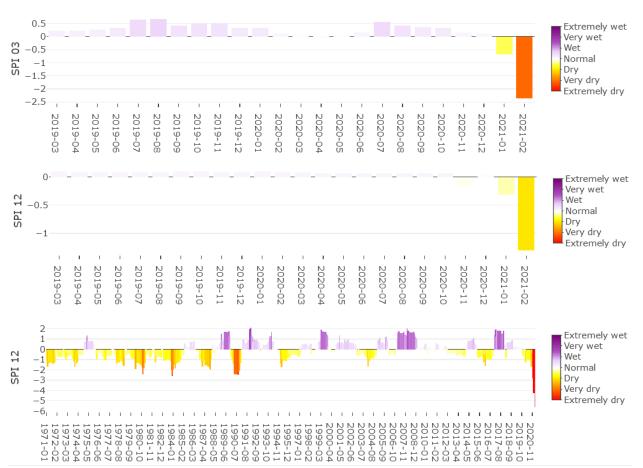


Figure 4: SPI for a cumulative period of 3 months (SPI-3, top) and 12 months (SPI-12, middle) in Huila (-15.2 N, 15.1 E). Bottom chart is SPI-12 for central Moxico (-12.6 N, 19.6 E).

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.

The onset of negative anomalies is first detected in mid-November 2020 in the northern half of Angola, but by the end of the same month similar patches appear in the centre-south too (Figure 5, left). Stress conditions intensified in the western regions since (Huila, Cunene, Namibe), with exception of the centre where conditions apparently improved (Figure 5, right).

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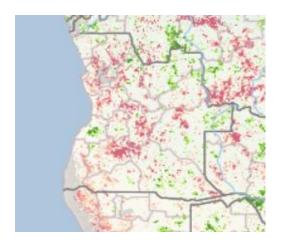
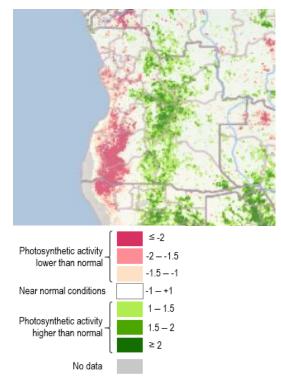


Figure 5: fAPAR anomaly in Angola for the period between 21st and 30th of November 2020 (left) and between 1st and 10th of March 2021 (right).



Soil moisture anomaly

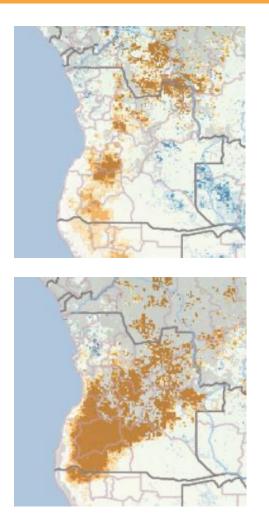
The aim of this indicator is to provide an assessment of the topsoil water content, which is a direct measure of drought conditions, specifically the difficulty for plants to extract water from the soil.

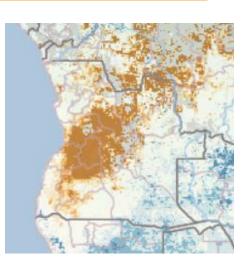
Evidence of anomalous soil dryness emerged in mid-December 2020, particularly over Huambo province (Figure 6, top-left), to expand around the centre in January (Figure 6, top-right) and eventually over a third of the whole Country by the end of February 2021 and early March (Figure 6, bottom-left).

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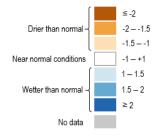


Figure 6: Soil moisture anomaly in Angola, for mid-December 2020 (top-left), January 2021 (top-right) and 10th of February to 10th of March 2021 (left).

Combined with the fAPAR, soil moisture confirms Huambo, Huila and Cunene as the most affected provinces, which have been suffering persistent negative anomalies since December 2020 (Figure 7).

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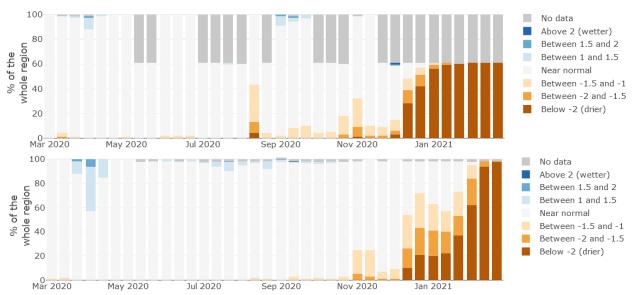
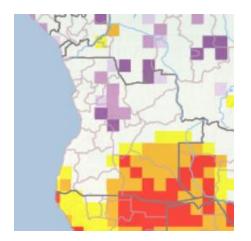


Figure 7: Soil moisture anomaly, evolution over time in provinces of Huambo (top) and Huila (bottom).

SPI outlook

The SPI outlook until May 2021 is neutral over the most affected provinces of the south-west, suggesting a normal end of the rainy season (Figure 8). However, given the accumulated deficit and despite March being the wettest month of the year, there is little chance of improvement of the drought conditions before the end of 2021. The south-east of Angola and the regions beyond the Country borders (Namibia, Botswana, Zambia) are forecasted to receive much less precipitation than usual, but they may benefit from the normal or above average rainfall up until March and the advanced stage of the growing season.



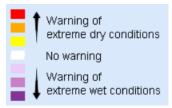


Figure 8: SPI forecast for the trimester March to May 2021.

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Reported impacts

The humanitarian situation in southern Angola is very serious. The national meteorological institute (INAMET) indicated provinces Huila and Namibe as the most affected provinces as of January 2021⁴, but the dire situation expanded to neighboring provinces.

People displacement towards other provinces and across the border with Namibia are reported from southern Angola, despite those destinations being as well affected by drought, a situation that may cause conflict with the local population^{5 6 7}. A few deaths attributed to hunger in Namibe province (Angola) were linked to the ongoing drought; water supply is diminishing, forcing people to move in search of water^{8 9 10}.

Severe impact to crops were reported, with losses up to 40%¹¹ in southern Angola, and high risk for livestock sustenance. Major issues for crops and livestock were reported from neighboring Namibia too^{12 13}. The government of Angola is providing help to rural communities in form of food, water infrastructures and agronomic support¹⁴.

Quantitative estimation of impacts is not available, but an in-depth analysis performed after the drought of 2015-16¹⁵ provides excellent insights in the possible outcomes of the drought, given socio-economic conditions.

¹¹ https://www.voaportugues.com/a/kwanza-sul-seca-compromete-colheita-na-cela/5810793.html

⁴ http://inamet.gov.ao/ao/boletim-agrometeorologico/

⁵ https://informante.web.na/?p=302037

⁶ https://www.angop.ao/noticias/sociedade/curoca-volta-a-ser-epicentro-da-seca-no-cunene/

⁷ https://novojornal.co.ao/sociedade/interior/milhares-de-angolanos-passam-fronteira-namibiana-para-fugir-a-fome---seca-esta-a-pressionar-as-populacoes-do-sul-101315.html

⁸ https://www.voaportugues.com/a/seca-amea%C3%A7a-com-mais-fome-e-j%C3%A1-h%C3%A1-mortes-no-namibe/5788453.html

⁹ https://www.voaportugues.com/a/activistas-revelam-tr%C3%AAs-mortes-por-fome-no-namibe-e-alertam-parasitua%C3%A7%C3%A3o-dram%C3%A1tica-/5780138.html

¹⁰ https://www.rtp.pt/noticias/mundo/seca-e-fome-no-sul-de-angola-ganham-proporcoes-alarmantes-diz-ong_n1299521

¹² https://www.namibian.com.na/99685/read/Low-rainfall-heat-cripple-crop-farmers

¹³ https://www.namibian.com.na/99914/read/We-are-waiting-to-die

¹⁴ https://www.noticiasaominuto.com/mundo/1697803/angola-reforca-distribuicao-de-insumos-agricolas-para-mitigar-efeitos-de-seca

¹⁵ https://ec.europa.eu/fpi/sites/fpi/files/pdna/pdna_-_angola_2016_-_report_1.pdf

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Figure 8: Map of the provinces of Angola. Source: Wikimedia Commons, CC BY-SA 3.0

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