SPECIAL FOCUS[i] – March 2021

Persistent drought conditions in parts of Southern Africa

The main agricultural season is ongoing in Southern Africa and most areas have received average to above-average rain from the start of the rainy season in October/November 2020, thus crop and rangeland conditions are favourable in most parts. Exception is parts of Angola, Namibia, Mozambique and Madagascar. This report provides an overview of the rainfall and vegetation conditions over the affected areas, factors that are important for agricultural monitoring and for early warning activities for food insecure countries.

Rainfall has been well below-average since the start of the rainy season in southwestern Angola, in northwestern Namibia, in the northern and coastal parts of Mozambique, and southern Madagascar (Figure 1). The affected areas in Angola and Namibia are experiencing the driest season since 1981 (INAMET, SADC). In **Angola**, the southwestern and central parts have registered ca. 60%-80% below-average cumulated rainfall amounts from December 2020-until to mid-February 2021. In **Namibia**, the northwestern part, mainly Kunene and Omusati provinces, recorded ca. 35%-40% below-average rainfall from the start of the rainy season in November 2020 until mid-February 2021. Similarly, the coastal provinces of northern **Mozambique** have experienced large rainfall deficits, particularly Nampula and Cabo Delgado that, from November 2020 to mid-January 2021, received ca. 70% below-average rainfall. Finally, southern **Madagascar** has received 50%-60% below-average cumulated rainfall from November 2020 until January 2021.

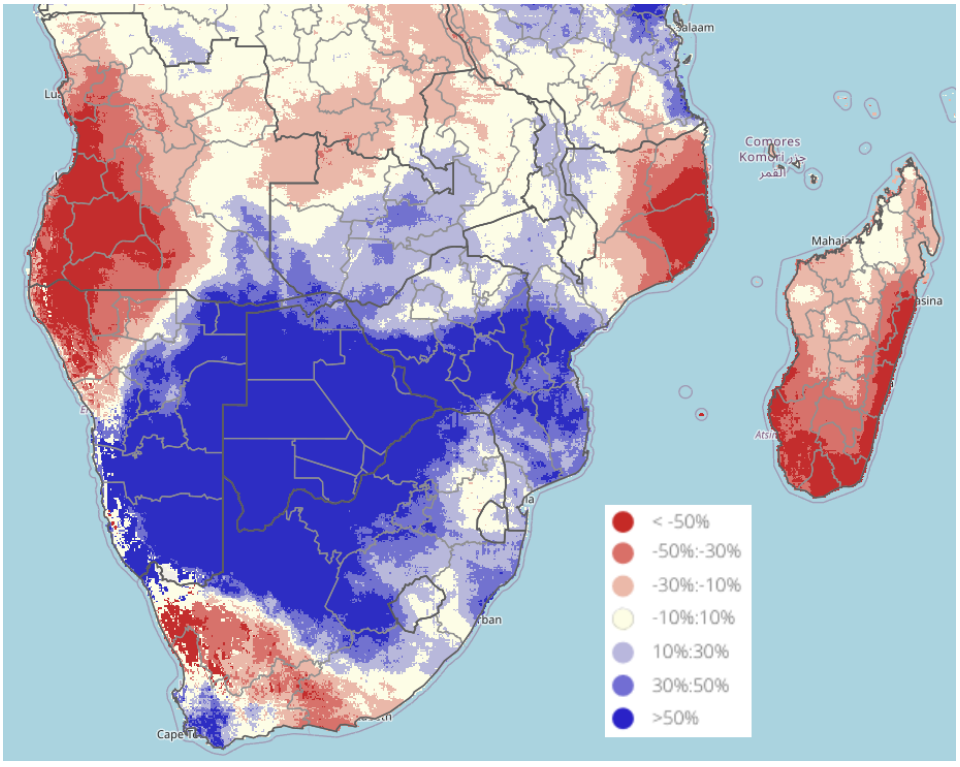

Figure 1. Cumulative rainfall anomaly for November/ December /January in %, showing significant seasonal rainfall deficits for the affecting countries in Southern Africa region.

Due to the poor rainfall conditions, crops and rangelands in the affected areas are significantly impacted. This is reflected in the cumulative Normalised Difference Vegetation Index (NDVI) anomaly map (Figure 2), with biomass showing negative anomalies in the affected areas of Angola, Namibia, Mozambique, and Madagascar.

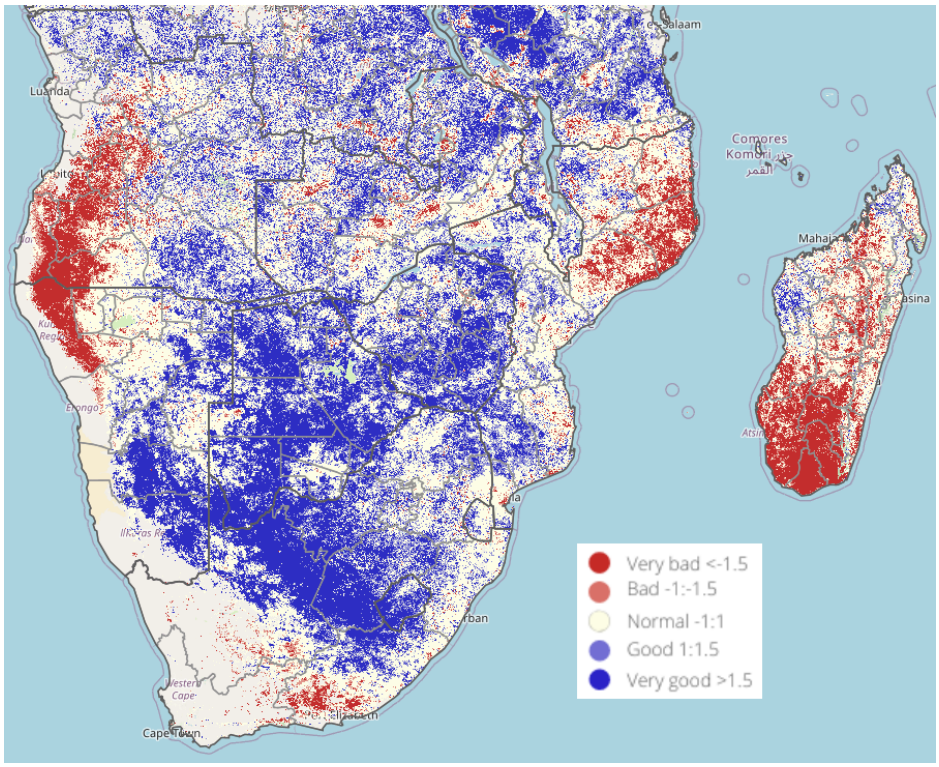

Figure 2. Standardized anomalies in cumulative NDVI at mid-February 2021

INFO BOX 1 - NORMALISED DIFFERENCE VEGETATION INDEX (NDVI)
The NDVI (Normalised Difference Vegetation Index) is used as an indicator of vegetation health. It is a combination of the red and near-infrared bands registered by satellites.

High-resolution imagery of the Sentinel2 sensor can be used to zoom in to the field level for the agricultural areas most concerned by drought and to compare crop conditions with reference years. The images from Sentinel2 presented in this report are false-color composites with (i) red showing active vegetation, (ii) light green highlighting bare soil or sparsely vegetated soil, and (iii) purple indicating water bodies.

INFO BOX 2 – SENTINEL
Sentinel is an Earth Observation mission of the European space program Copernicus and operated by the European Space Agency (ESA), that provides accurate, timely and easily accessible information to improve the management of the environment, understand and mitigate the effects of climate change and ensure civil security (ESA). Sentinel 2 acquires optical imagery at high spatial resolution over land and coastal waters. Sentinel data are available to the public at no cost.

In Figures 3, 4, and 5 cropping areas in the Huila province of Angola, in Androy province of Madagascar, and in Omusati province of Namibia, respectively, are shown by Sentinel2 imagery for February 2021 (top) and

the same period of 2020 (or 2019 for Madagascar) (bottom). In all the figures, poor vegetation conditions in 2021 are visible compared to the reference year. It is evident that a major part of the planted area in all figures can be seen in light green in 2021, indicating bare soil, instead of red, as in the comparison year, indicating active vegetation. Additionally, for Omusati province, apart from the reduced vegetation activity, water bodies are also affected, being dry in 2021 (green color), in comparison with 2020 when water presence was evident (purple color).

INFO BOX 3 – False Color Composite

The colour assignment for any band of a multispectral image can be done in an arbitrary manner does not necessarily have any resemblance to its actual colour (CRISP). The resulting product is known as a false colour composite image. There are many different false color composites that can be used to highlight different features. For agriculture monitoring applications a widely used band combination is: NIR (Near Infrared) - SWIR (Short wave Infrared) - R(red). **In the false color composites in this report, healthy vegetation appears red and bare or sparsely vegetated soil appears green**.

It is evident that the persistent drought conditions have a clear impact to crop and rangelands across the affected areas and as the agricultural season has already progressed, there are little chances for recovery in the case of improved rainfall over the next months. Huila province provides a significant contribution to the national maize production of Angola (nearly 15%) and the persistent drought conditions are expected to negatively impact cereal output for 2021. According to FEWSNET, many poor households in the south of Madagascar sowed maize and pulses several times, but due to the insufficient rainfall, crops did not develop, and ground information suggests that many households no longer have additional resources to replant.

Some the impacted areas have been exposed to repeated drought in the last 3 years and in some cases are also affected by conflict (northern Mozambique) leading to a fragile food security situation, which might not be fully compensated by the above average cereals production in other parts of Southern Africa.

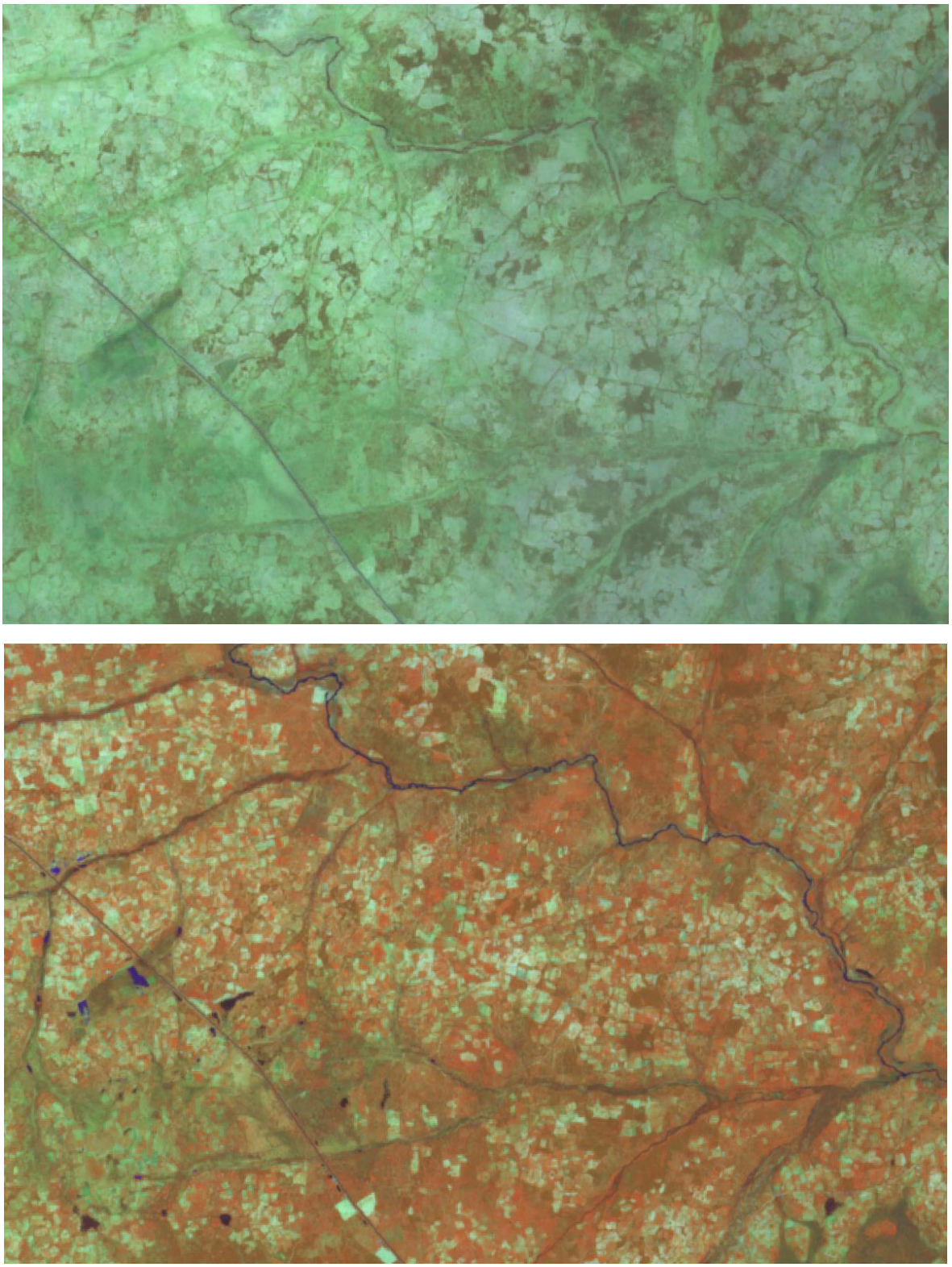

Figure 3. Cropping areas in Huila province, in Angola in February 2021 (top) and in February 2020 (bottom) (see more at ASAP High-Resolution Viewer).

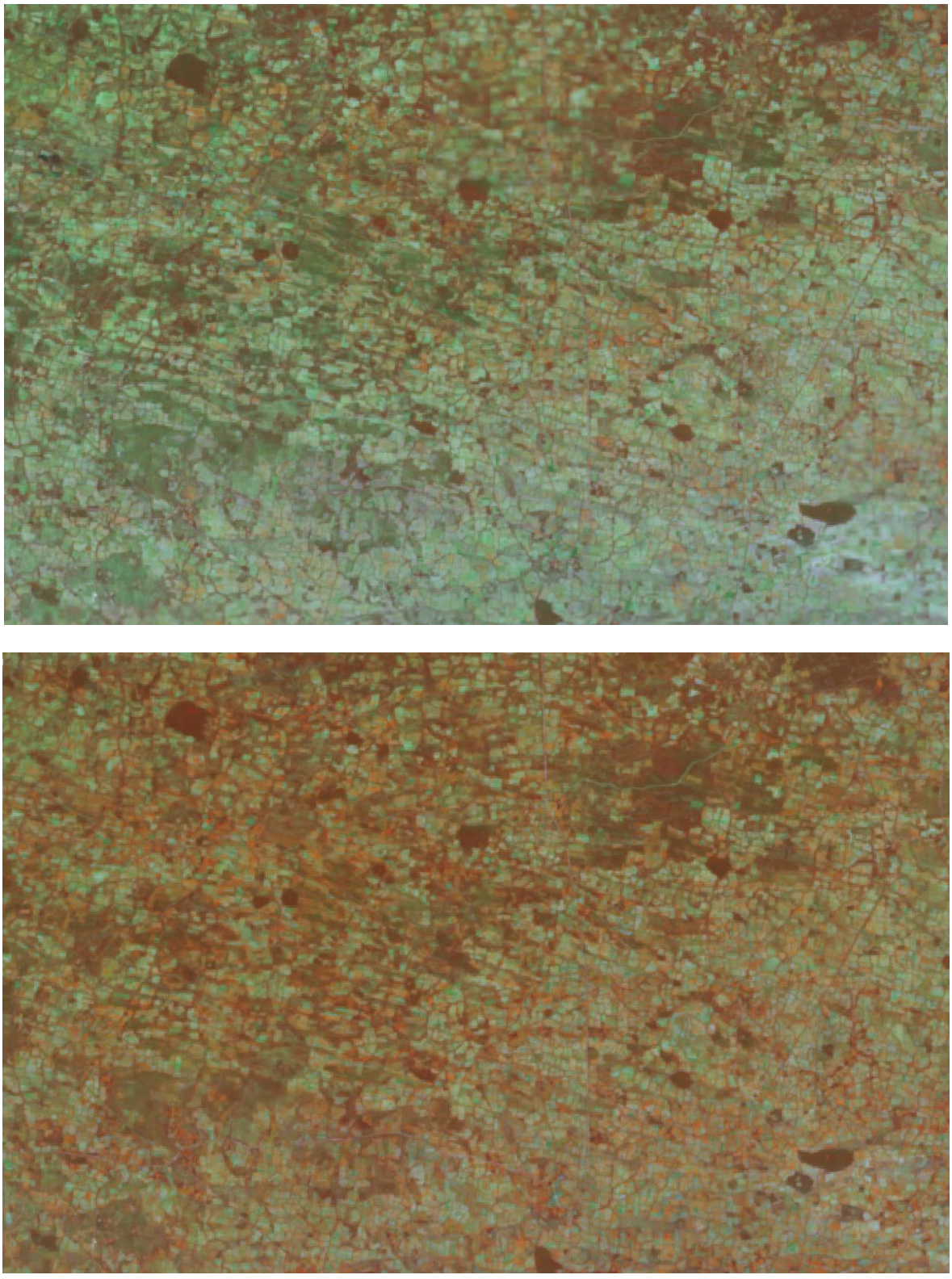

Figure 4. Cropping areas in Androy province, in Madagascar in February 2021 (top) and in February 2019 (bottom) (see more at ASAP High-Resolution Viewer).

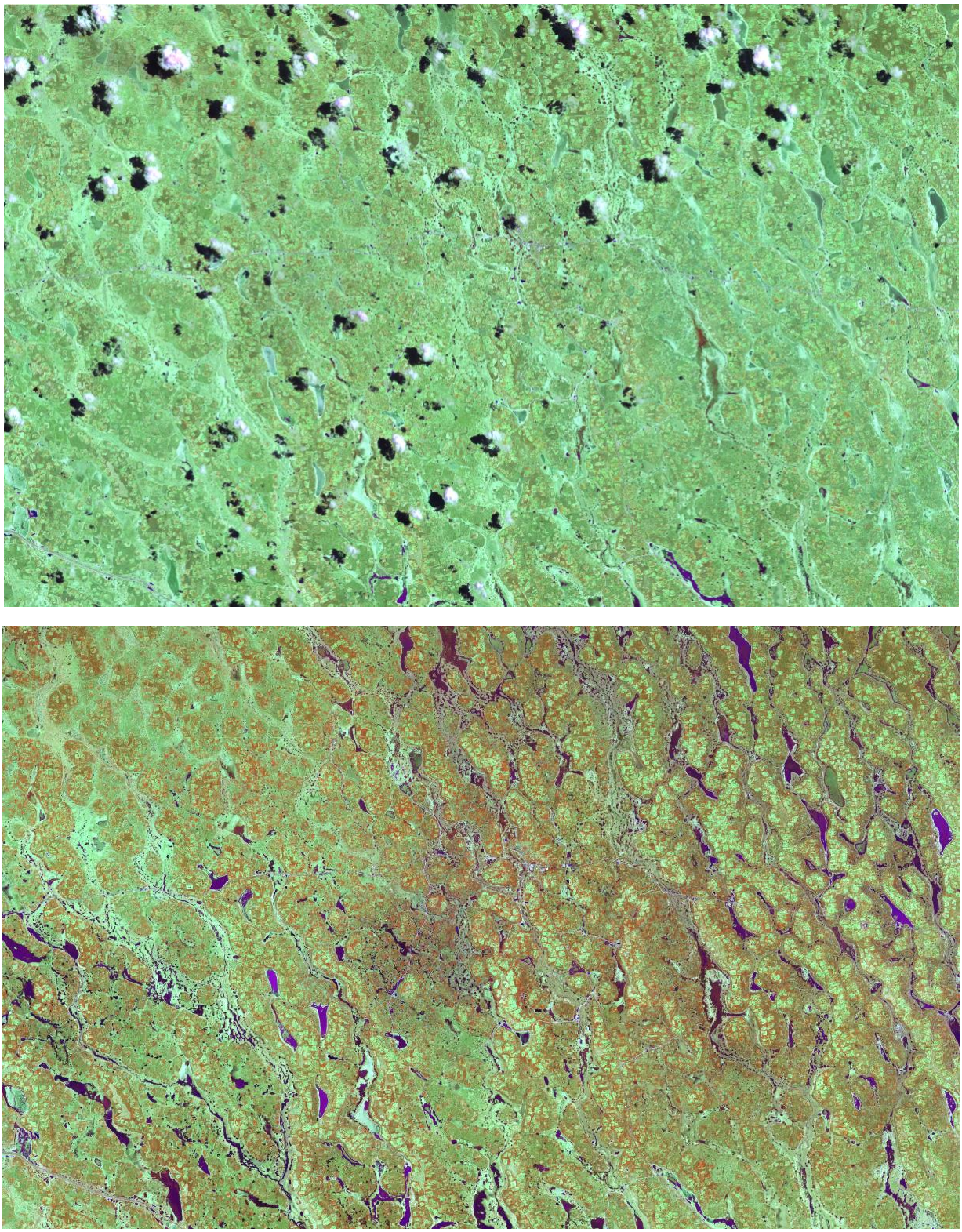

Figure 5. Cropping areas in Omusati province, in Namibia in February 2021 (top) and in February 2020 (bottom). Water bodies in 2021 have dried out (green), compared with 2020 when water was evident (purple color) (see more at [ASAP High-Resolution Viewer](#)).

More information can be found here:

- INAMET: http://www.inamet.gov.ao/ao/boletim-agrometeorologico/
- SADC:https://fews.net/sites/default/files/documents/reports/SADC%20Agromet%20Update%20Issue-04%20-%202020-2021.pdf
- FEWSNET Madagascar: https://fews.net/southern-africa/madagascar/food-security-outlook/march-2021
- FAO Mozambique: http://www.fao.org/3/cb3472en/cb3472en.pdf

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Feedback can also be posted on Twitter by including the hashtag: #asapEU

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[i] (Special focus reports add information based mainly on the analysis of satellite imagery and links to other sources, to the monthly ASAP global overview that can be found at the website: https://mars.jrc.ec.europa.eu/asap/)