SPECIAL FOCUS – September 2021

Southern Madagascar faces the worst food and nutrition crisis aggravated by the failure of crops due to three consecutive years of drought

Southern Madagascar faces the worst food and nutrition crisis in decades (UNICEF). The most severe drought in the past 40 years (ECHO, July 2021) wiped out harvests and cut off people's access to food. Three years of consecutive drought leading to low agricultural productivity, a lack of essential food staples in the market, combined with the socio-economic impact of the COVID-19 pandemic, have severely deteriorated the food security situation. Hence, large-scale humanitarian assistance on food and nutrition emergency is needed and should be sustained through at least early 2022 (FEWSNET).

Over 1.14 million (43% of analyzed population) are estimated to face food insecurity (IPC Phase 3 or above) in 13 districts of southern and south-eastern regions, of which nearly 14,000 people are estimated to be in Catastrophe (IPC Phase 5) for the period between April-September 2021 (Figure 1). The people facing Crisis and Emergency increased by 35%, compared with the January-March period (FAO). The most concerning district is Amboasary, with 75% of its population in Phase 3 or worse. The high levels of acute food insecurity are expected to worsen during the lean season period, between October and December 2021, with around 1.31 million people (49% of the analyzed population) projected to be acutely food insecure (IPC Phase 3 or above). The population in Catastrophe (IPC Phase 5) is expected to double. Regarding the nutritional situation, it remains a concern with over 500,000 under-five children probably suffering from acute malnutrition through April 2022, of which 110,000 suffer severe malnourishment, with an urgent need of action (IPC, July 2021). According to the results of a Preliminary SMART survey conducted between April and June 2021, the nutritional situation in southern Madagascar, deteriorated compared to previous surveys in November 2020. Particularly in the Ambovombe, Bekily, Beloha, Tsihombe and Betioky districts (UNICEF).

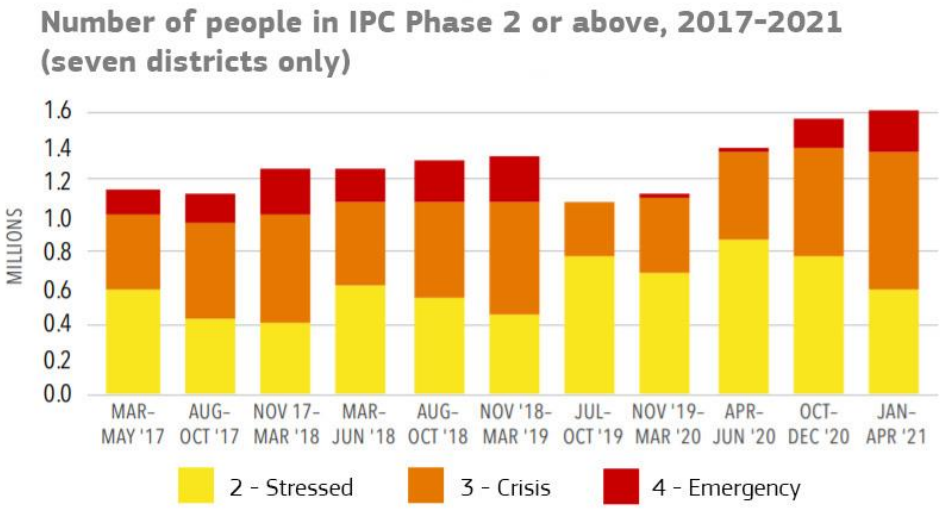


Figure 1. Number of people in IPC Phase 2 or above (Stressed), 2017- 2021. Source: Global Report on Food Crises 2021.

The failed 2020-2021 season in southern Madagascar compounded the effects of several consecutive poor harvests owing to recurrent droughts, pest infestations, sandstorms and reduced incomes because of the COVID-19 restrictions. According to FEWSNET, yield prospects in southern Madagascar were estimated at 50-70% below the five-year average and 10-30% below the previous year. Maize production, mostly

concentrated in the so-called Grand Sud (i.e., Androy, Anosy and Atsimo Andrefana), was expected to be lower than the 2019/20 season (FAO). According to EDCASA, rice production declined 60% in the south, with peaks of 90% in localized areas of Bekily and Nord d'Amboasary. Production prospects of sweet potatoes, maize and cassava were estimated to be about 75% below average, with peaks of 95% in areas of Ambovombe, while pulse production was expected at 70% below-average with peaks of 91% in zones of Bekily and 77% in Ambovombe. Dry conditions also affected the eastern coastal and central parts of the country. Furthermore, sandstorms in the southern coastal districts (e.g., Ambovombe) and reported Fall Armyworm in Ampanihy and Amboasary, led to maize crop losses (EDCASA).

Conversely, yields in the northern-central regions, that produce most of the country´s rice, were estimated at an above-average level, but to slightly decline compared to the high outturn of 4.2 million tonnes in 2020 amid positive rains since the start of the season in October (FAO). Weather conditions were near average throughout the season in regions such as Vakinankaratra and Itasy, which account for 16.9% and 10.5% of the national cereal production respectively and produce the bulk of the national rice output.

Seasonal rainfall spans from October to March, with December to February rainfall being key for crop establishment and development. According to CHIRPS rainfall estimates, planting of the 2020/21 season in southern Madagascar was delayed with rainfall below-average levels, and soil moisture deficits reflecting the lingering effects of low cumulative rainfall in the 2019/20 season. Besides, consecutive years of reduced harvest affected the productive capacity of farming houses, limited availability of retained seeds, and the planted areas decreased. Drought prevailed in the south, but also in central Madagascar during the core period of the season (December-March). Cumulative rainfall amounts from November 2020 until January 2021 were between 50 to 60% below average, affecting negatively crop establishment and suppressing yields (Figure 2). Despite the increase recorded since 21st January, rainfall arrived too late to significantly allow vegetation to recover from prolonged drought.

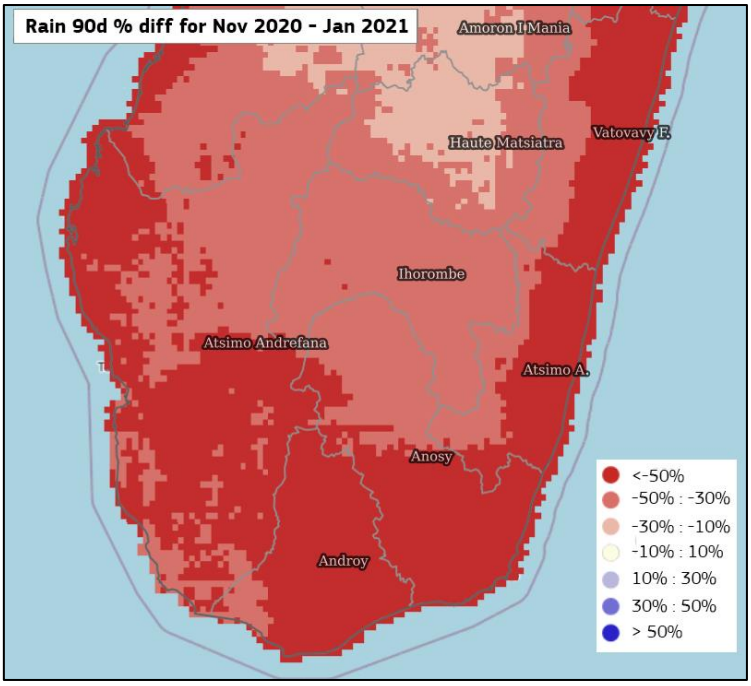


Figure 2. CHIRPS Cumulative rainfall anomaly for November/December/January in % showing significant rainfall deficits for Southern Madagascar.

Abnormal dryness hampered vegetation production as it is reflected in the cumulative Normalized Difference Vegetation Index (NDVI) anomaly map (Figure 3), with biomass showing negative anomalies not only in the three southern regions, but also in Inhorombe and Atsimo Atsinana. At the end of March, Ansoy, Androy, and Atsimo Andrefana were affected by a very significant negative greenness anomaly (84%, 88% and 58%,

respectively). Negative impact on crop conditions is visible in the temporal profile (Figure 4) that at the beginning of the 2020/2021 growing season shows below-average values compared with both, the long-term average and the previous year.

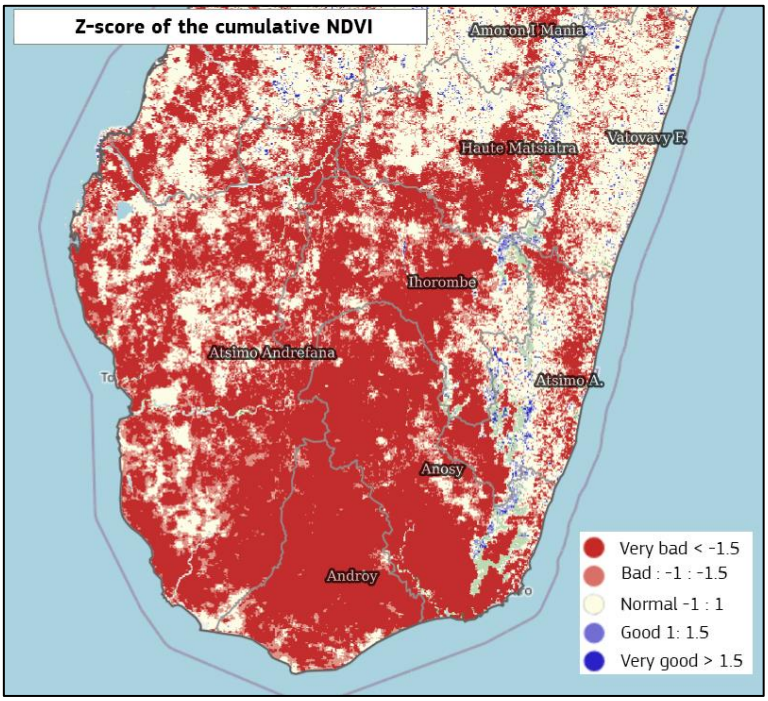
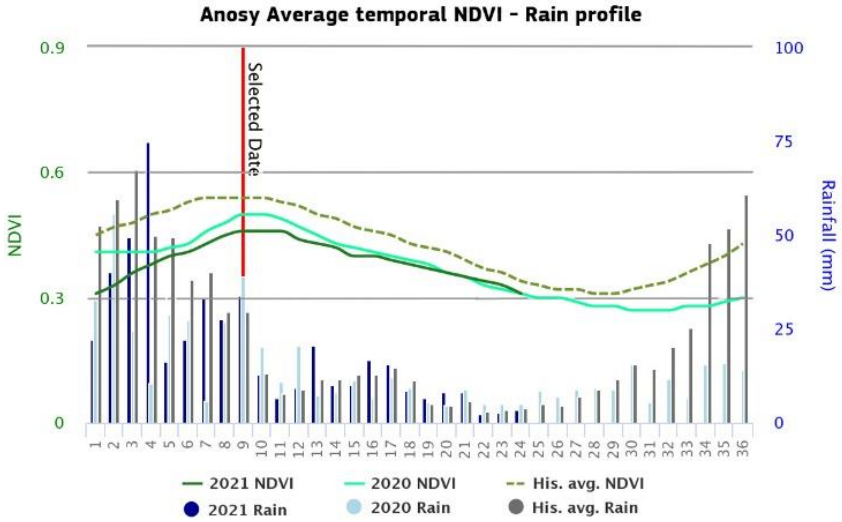


Figure 3. Standardized anomalies in cumulative NDVI from the start of the growing season until the end of March 2021.

These sparse rainfall amounts also threatened water supply for livestock, and resulted in pasture degradation. As a result, livestock body conditions worsened leading to a reduction in milk production and reducing the market value of animals, an important asset for many rural households.



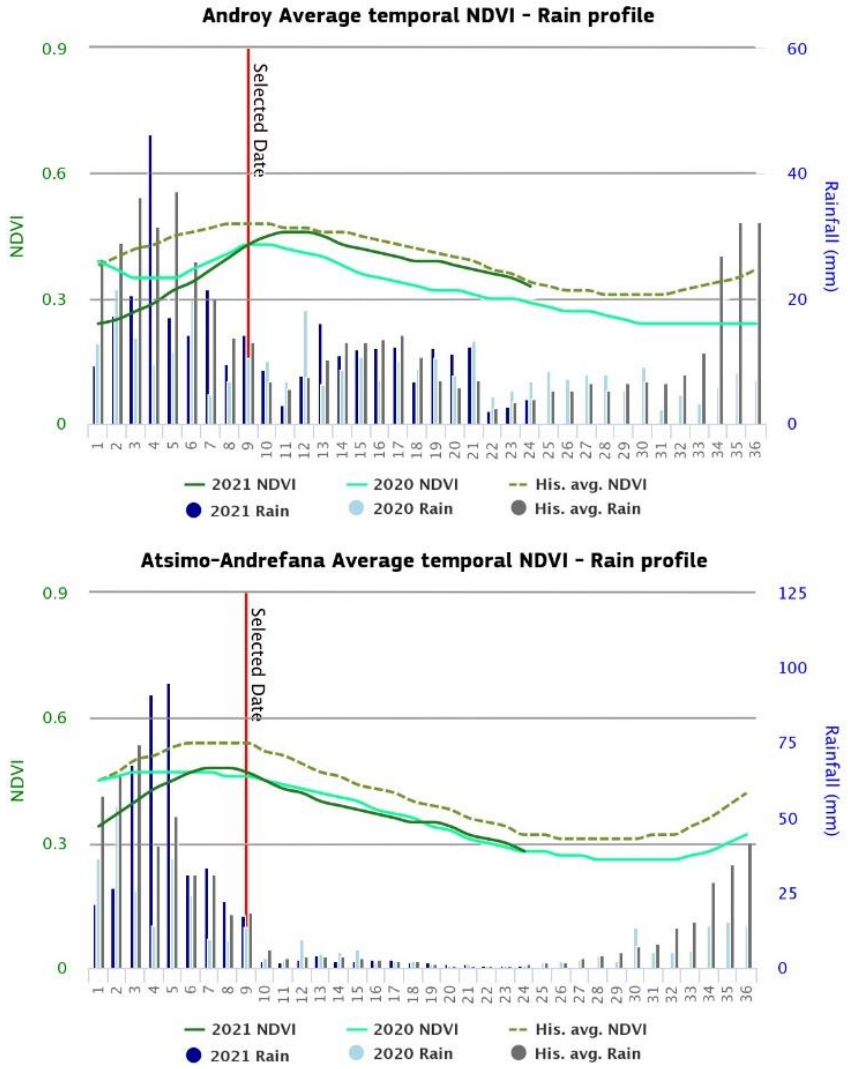


Figure 4. MODIS NDVI-CHIRPS rainfall time profiles for cropland areas of the Anosy (top-left), Androy (top-right) and Atsimo-Andrefana (bottom) regions. NDVI is clearly below-average in the three regions due to below-average rains in 2019/2020 that led to soil moisture deficits. Vegetation conditions remained below-average and close to the poor values of the last season in Anosy and Atsimo-Andrefana. Positive rains since late January partly recovered vegetation status in Androy, but were too late for a full recovery.

INFO BOX 2 – SENTINEL

Sentinel is an Earth observation mission from the European Space Agency's Copernicus Program 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's data are available to the public at no cost.

High-resolution imagery of the Sentinel-2 sensor was used to zoom in to the field level for the 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.

Figures 5, 6 and 7 show cropping areas of Anosy, Androy, and Atsimo-Andrefana regions in March 2021 (top), and the same period of 2019 (bottom), when weather conditions in the Grand Sud were near average (GEOGLAM). Poor vegetation conditions in 2021 are visible compared to the reference year. It is evident that

a major part of the planted areas 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. Besides, water bodies in Anosy were also affected and a reduction of water bodies is visible when compared with 2019. These images clearly confirm the information derived from the lower resolution NDVI data in figure 3, i.e., the failure of cropland and pastures for the 2020/2021 season, and highlights the difference in crop extent as compared with a year with favorable weather conditions (2019).

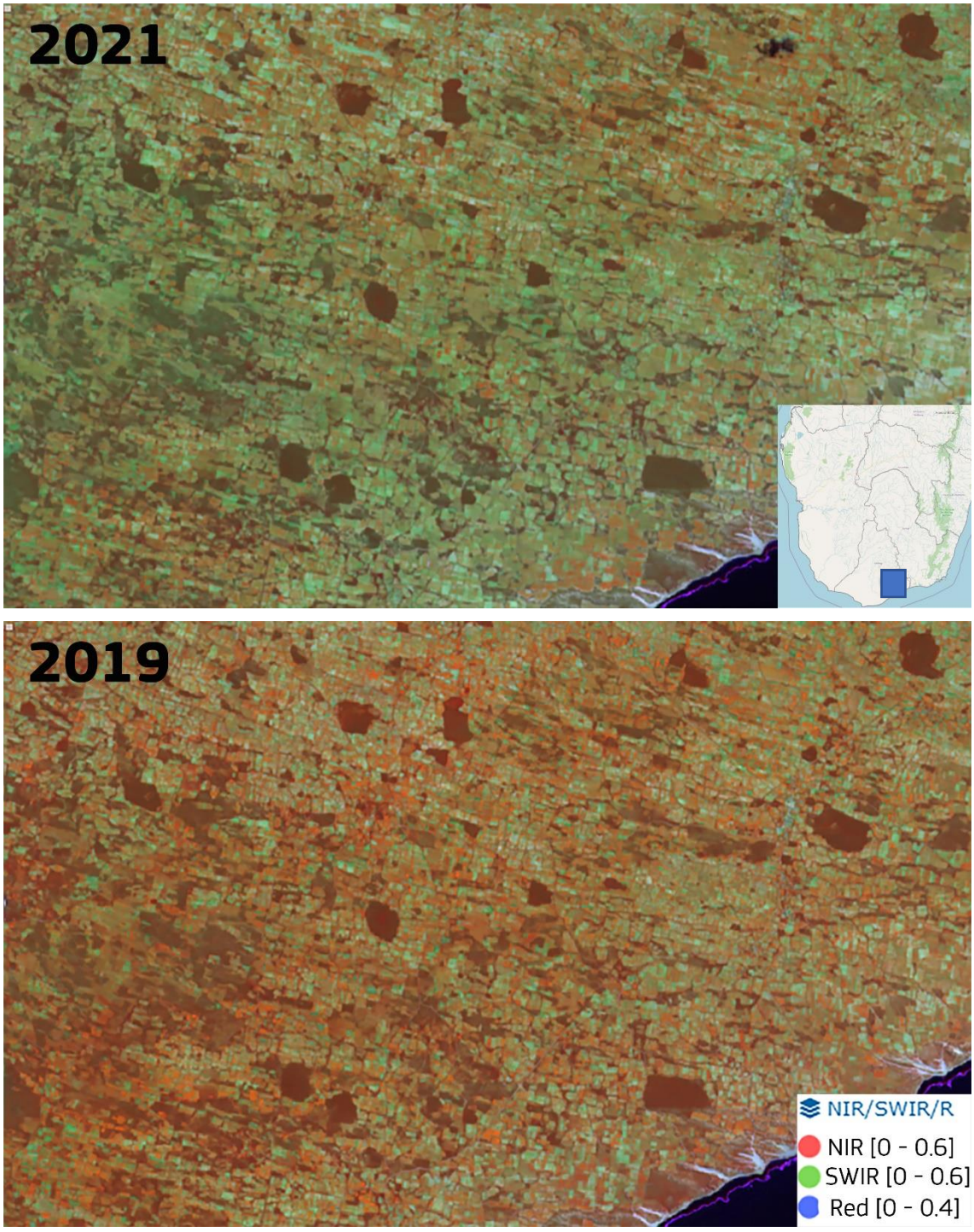


Figure 5. Cropping areas in the Androy region in March 2021 (top) and in March 2019 (bottom) (see more at ASAP High-Resolution Viewer).

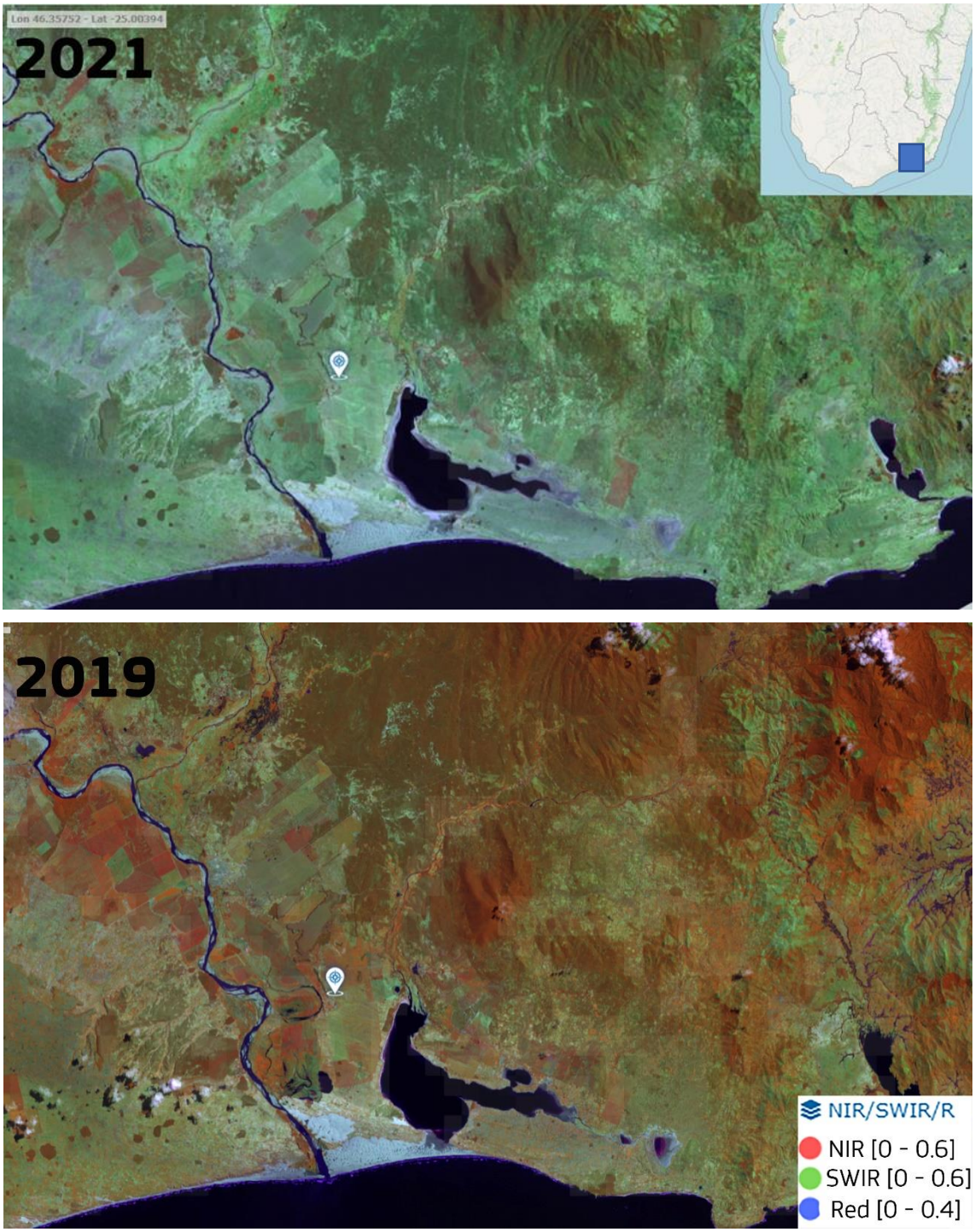


Figure 6. Cropping areas in the Anosy region in February 2021 (top) and in February 2019 (bottom) (see more at ASAP High-Resolution Viewer).

INFO BOX 3 – False Color Composite
The display color assignment for any band of a multispectral image can be done in an entirely arbitrary manner and in this case, the color of a target in the displayed image does not have any resemblance to its actual color (CRISP). The resulting product is known as a false color composite image. There are many different false colored 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 this false color composite, healthy vegetation appears red and bare or sparsely vegetated soil appears green.

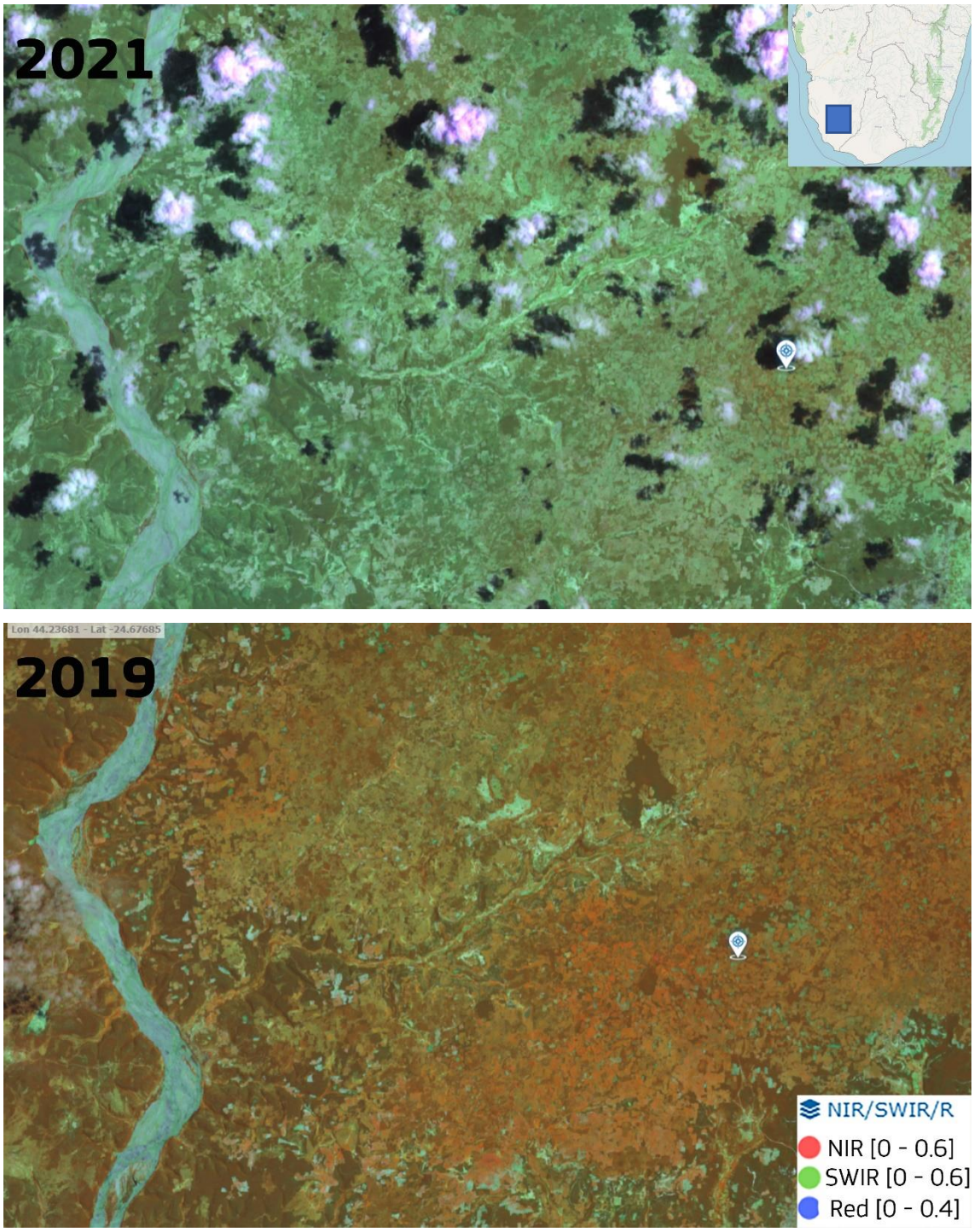


Figure 7. Cropping areas in the Atsimo-Andrefana region in February 2021 (top) and in February 2019 (bottom) (see more at ASAP High-Resolution Viewer).

The 2021/22 rainy season, which is due to begin in October, is forecast to start late and with a higher-than normal probability of below-average rainfall amounts during the first three months. This might further aggravate poor crop and rangeland conditions and add further pressure on food security (FEWSNET). Moreover, an outbreak of migratory locust that infected more than 48,000 hectares of land in the south, is also likely to hamper the upcoming main planting season (OCHA, 2021 July).

More information can be found here:

- ECHO July 2021 https://reliefweb.int/sites/reliefweb.int/files/resources/madagascar_2021-07-01.pdf

- EDCASA 2021 Évaluation du démarrage de la campagne agricole. https://fscluster.org/sites/default/files/documents/rapport_edcasa_2021.pdf http://www.fao.org/3/cb5603en/cb5603en.pdf
- FEWSNET Madagascar June 2021 alert https://fews.net/sites/default/files/documents/reports/MG_ALERT_June2021.pdf
- GEOGLAM file:///C:/Users/usuario/Downloads/EarlyWarning_CropMonitor_201905.pdf
- GIEWS Update. The Republic of Madagascar. http://www.fao.org/3/cb6192en/cb6192en.pdf
- Global Report of Food Crises 2021 https://knowledge4policy.ec.europa.eu/publication/global-report-food-crises-2021_en
- Madagascar: Food Security and Nutrition Snapshot. July 2021 IPC Integrated Food security Phase Classification. http://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/IPC_Madagascar_FoodSecurity_NutritionSnapshot_2021July_English.pdf
- OCHA https://reliefweb.int/sites/reliefweb.int/files/resources/Madagascar_20210827_GrandSud_HumanitarianSnapshot%20%281%29.pdf
- UNICEF https://reliefweb.int/sites/reliefweb.int/files/resources/UNICEF%20Madagascar%20Grand%20Sud%20Situation%20Update%20No.%201%20%28drought%29%2001%20-%2030%20June%202021.pdf

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