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Using global remote sensing and weather data efficiently for agricultural hotspots monitoring anywhere anytime: the ASAP online system

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Monitoring agricultural production in vulnerable developing countries is important for food security assessment and requires near real-time (NRT) information on crop growing conditions for early detection of possible production deficits. The public online ASAP system (Anomaly hot Spots of Agricultural Production) is an early warning decision support tool based on weather data and direct observation of crop status as provided by remote sensing. Although decision makers and food security analysts are the main targeted user groups, all the information is fully made available to the public in a simple and well documented online platform. The information further contributes to multi-agency early warning products such as the GEOGLAM Crop Monitor for Early Warning and food security assessments following the IPC-Cadre Harmonisé framework.

Low resolution remote sensing (1 km) and meteorological (5-25 km) data are processed automatically every 10 days and vegetation anomaly warnings are triggered at the first sub-national administrative level. The severity of the warnings is based on the observed land surface phenology and three main derived indicators computed at the 1 km grid level: a proxy of the current season biomass production (the cumulative value of the Normalized Difference Vegetation index from the start of season); an indicator of precipitation deficit (the Standardized Precipitation Index at the 3 month scale); and a water-balance model output (the Water Requirement Satisfaction Index). Warning maps and summary information are published on a web GIS every ten days and then further analyzed by analysts every month. This results in the identification of hotspot countries with potentially critical crop or rangelands production conditions.

In addition to the hotspots analysis and the warning explorer, users can also zoom in to the parcel level thank to the so called High Resolution Viewer, a web interface based on Google Earth Engine that allows to visualize Sentinels (1 and 2) and Landsat imagery, plot temporal profiles and perform basic anomaly operation (e.g. current year NDVI anomaly with respect to a reference year).

In the near future it is planned to make the anomaly warnings available also at the second sub-national level and to integrate meteorological forecasts in the warning system.