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Using Earth Observation to mitigate the impacts of droughts and floods in Uganda

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Throughout Africa, farmers are both grappling with droughts and poor rainy seasons as well as having to deal with heavy downpours causing flooding of their lands. The intensity and length of the dry seasons as well as the timing and intensity of the rainy seasons are becoming more and more unpredictable. Although the Uganda National Meteorology Authority (UNMA) has registered improvements in weather predictions in the recent past, the situation in Uganda is no different: reliable and actionable weather and crop data is often not (known to be) available or inaccessible and of varying quality which leads to underperforming agricultural production and food insecurity.

Access to robust meteorological, hydrological, and other Earth Observation (based) information as current observations, future forecasts, and historical archives enables informed decisions to be taken, risks and their associated humanitarian and financial losses to be reduced, and the effects of climate change to be mitigated.

Whilst in the coming years and decades Uganda's National Meteorological and Hydrological Services continue to increase their capacity to process environmental data; develop forecasting models; and provide relevant information to decision-makers in Uganda's public and private sector, the Drought and Flood Mitigation Service (DFMS) Project is taking an innovative approach to allow those decision-makers to benefit from that relevant information now.

Working in cooperation with relevant Ugandan Ministries, Departments and Agencies under the leadership of the Ministry of Water and Environment (MWE), a consortium led by the RHEA Group has created a suite of information products relevant to drought and flood forecasting and monitoring that are provided as a subscription-based service. DFMS will support the MWE with reliable satellite data for monitoring of SDG 6 and 13 and augment the existing EO methods and tools currently being employed by the MWE for derivation of spatial and temporal indicators on wetland status and trends under the GlobWetland Africa project.

DFMS contains a range of features (e.g. weather and hydrology forecasts, satellite observations, climatology data) which will be provided as an online service, operated by the RHEA Group. This removes the need for infrastructure investment and operating the underlying platform. Moreover, the service must continuously develop and meet changing user needs to stay competitive with drives sustainability. And because the features constituting DFMS also enable making informed, day-to-day water, environmental, and agricultural management decisions, there is a substantial overall user base which includes the commercial agriculture sector.

The DFMS Platform is built using Open Source software, including Open Data Cube technology for storing and analysing Earth Observation data, and extensively uses (free) satellite remote sensing data, which minimises operating cost. The platform was designed to be scalable and replicable, which means it can easily be extended to contain additional features (e.g. related to landslides or crop diseases) or rolled out in other countries in the region and beyond. Now in its final year, the project is currently beta testing the service and is scheduled to become operational in May 2019.