Africa RiskView - Supporting early warning systems in Africa

Risk knowledge

Monitoring and warning service

Dissemination and communication

Response capability

The African Risk Capacity (ARC) is a Specialised Agency of the African Union (AU). The ARC Agency leads the ARC Group, a development finance institution that provides financial tools and infrastructure to help countries manage natural disaster risk and adapt to climate change. *Africa RiskView*, the "technical engine" of ARC, is a software platform that is mainly used to estimate the number of people potentially affected by disasters and associated response costs. One of the main components of *Africa RiskView* is the drought model, which translates satellite-based rainfall information into near real-time impacts of drought on agricultural production and grazing for each year for which data are available (1983 - present). This response costs data series determines each country's drought risk profile which is the basis for insurance policy terms and conditions. By overlaying this data with vulnerability information, the software produces a first order estimate of the drought-affected population, and in turn response cost estimates. Drought early warning, which is achieved through the monitoring of the main crop growing seasons, is one of the critical products offered by ARC through the *Africa RiskView* software.

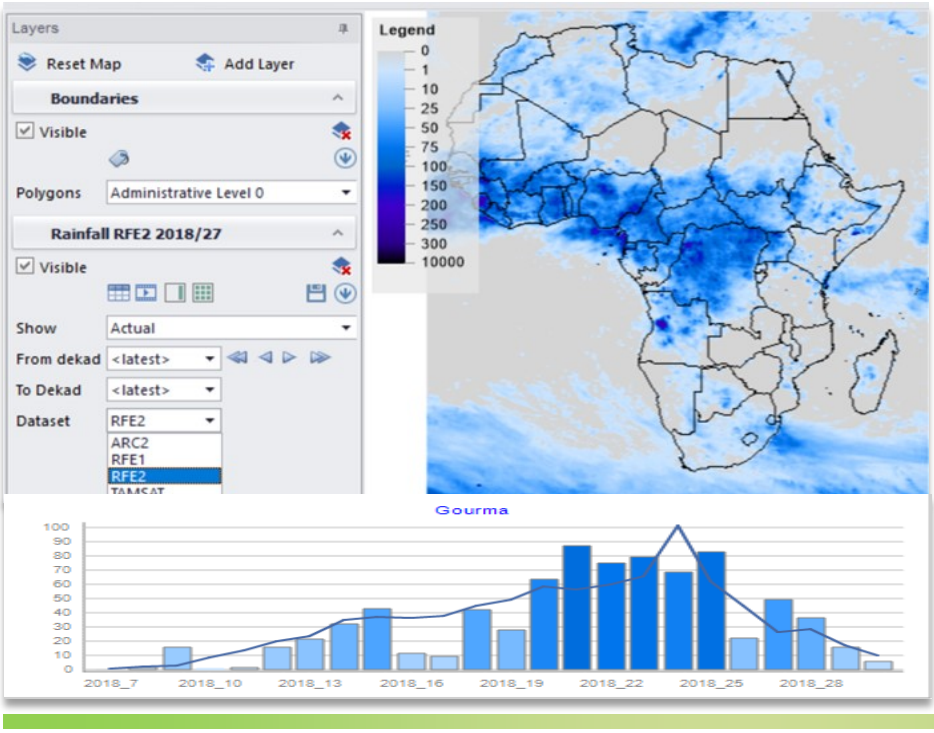
Food crop production in Africa is primarily rain-fed, with minimal irrigation, especially for the staple food crops. This places the monitoring of rainfall performance at the heart of food security early warning systems in Africa. This monitoring of the main crop growing regions allows analysts to get a good measure of expected food production and rangeland quality, identifying where and how severe the potential shortfalls may be.

Season Performance Monitoring using Africa RiskView

Africa RiskView allows users to access archives of time-series satellite-based rainfall estimates. This allows the comparison of current rainfall with historical averages and other relevant statistics. Rainfall data are fetched automatically every ten days and added to the time-series.

Data is provided at pixel level (10km by 10km) and can be aggregated for each area of interest for which shapefiles are available (e.g. administrative regions, agro-ecological zones or crop growing regions) and exported to other formats (e.g. Excel) for further analysis.

In *Africa RiskView* there is the possibility to monitor the season using rainfall estimates provided by the U.S. Climate Prediction Center (CPC), National Oceanic and Atmospheric Administration (NOAA), namely RFE2 available from 2000, Africa Rainfall Climatology Version 2.0 (ARC2) produced by Climate Prediction (USA), the TAMSAT African Rainfall Climatology and Time-series (TARCAT v2.0), produced by the University of Reading (UK), which are available starting from 1983 and are also produced every ten days at the same spatial resolution of 0.1 by 0.1 degrees.

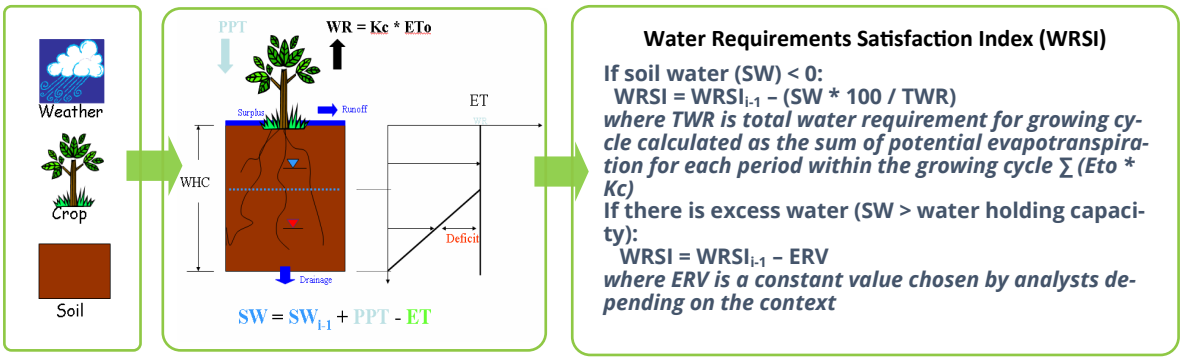


Africa RiskView Image viewer *– offers user-friendly tools for the viewing of current and historical data – users can loop through different types of time-series of data and choose from a number of different rainfall metrics to display (actual, normal, minimum, maximum, mean, median).*

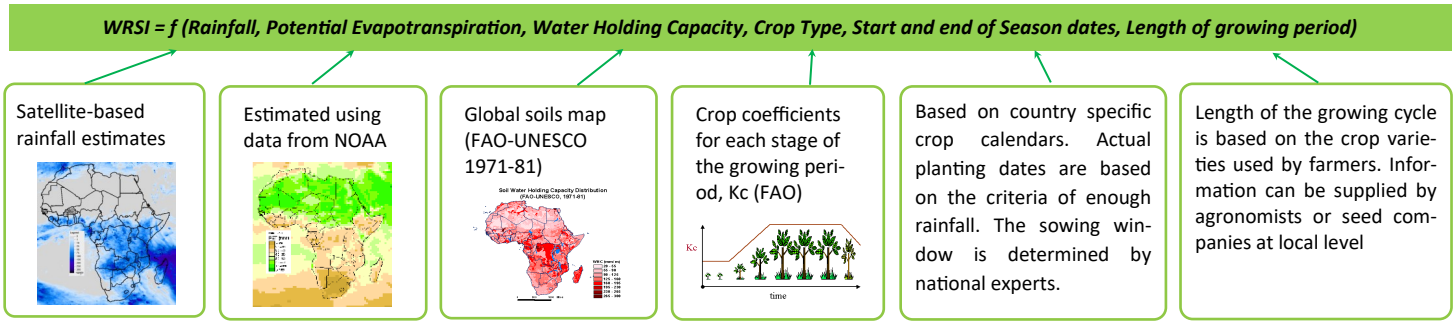
These tools allow risk analysts to monitor the progression of the crop growing season and develop advisory messages to allow decision makers to plan for appropriate responses.

Drought Index

Africa RiskView currently uses the Water Requirements Satisfaction Index (WRSI), a crop-specific index that assesses the impact of rainfall quantity and distribution on crop growth in each phase from sowing to maturity. This drought index is based on a water balance model developed by the Food and Agriculture Organisation (FAO) and the approach involves the comparison between water available to the crop and its specific requirements. Water deficits and excess impact negatively on crop performance. The WRSI calculations can be extended to the end of the season using normal rainfall to provide a forecast of end of season conditions.



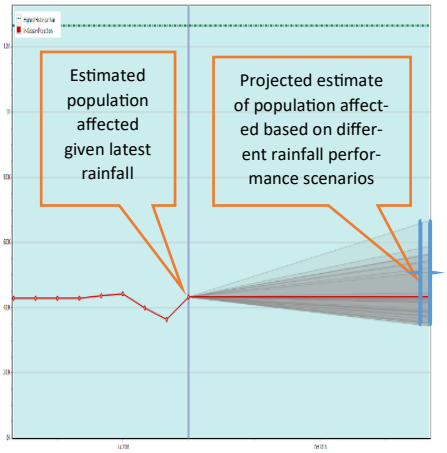
The sources of data for the WRSI calculations are shown in figure below.



Vulnerability assessments

Vulnerability profiles help analysts determine the likely impacts of observed rainfall patterns, particularly to estimate the sizes of population potentially affected in areas of interest. The vulnerability profile for each country is determined based on available household survey data from national government, which provide information on the households exposure to drought risk (i.e. income sources) and resilience (e.g. wealth, poverty status of the households). Vulnerability analyses are done outside the *Africa RiskView* software and are only used as input data into the model. The information is then aggregated at "vulnerability polygon" level, which is a specific geographical unit within a country for which the household data used are statistically representative.

Impact assessments



By overlaying the drought index information and the vulnerability profile, the model quantifies the impact of drought by estimating the numbers of people likely to be food insecure at the end of the season. During the progression of the season, rainfall estimates are updated every 10 days and so is the drought index, whose end of the season value is then determined using the available real-time rainfall data and completed using normal values for the dekads still to come, hence allowing for an early warning of the likely future impact. While these estimates are certainly more reliable towards the end of the season, they can enable decision makers to prepare early enough for the potential response.

How to obtain *Africa RiskView* software

To obtain access to the software, prospective users need to register online on the *Africa RiskView* website, *http://www.africariskview.org/register.aspx*. Note that *Africa RiskView* is accessible only to ARC Member States and ARC partners. Requests for access are evaluated against these criteria. Once access has been granted, *Africa RiskView* can be downloaded at *http://www.africariskview.org/download.aspx*.

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