

Africa RiskView

A software package for the assessment of impacts of natural hazards and supporting effective disaster response



The African Risk Capacity (ARC) was established to help African Union Member States improve their capacities to better prepare for and respond to disaster events arising from the various natural hazards faced on the continent, therefore protecting the food security of their vulnerable populations. A key part of the ARC strategy is the provision of innovative tools and products for Member States to effectively manage their natural disaster risk. *Africa RiskView* is a collection of software tools used by ARC to estimate the number of people affected by disaster events and the associated response costs. *Africa RiskView* is also used for the season monitoring which allows the for provision of early warning to decision makers on the likely impacts of natural hazards encountered. The *Africa RiskView* drought package translates satellite-based rainfall information into near real-time impacts of drought on agricultural production using existing operational early warning models. By overlaying these data with vulnerability information, the software produces a first-order estimate of the drought-affected population, and in turn response cost estimates.

DROUGHT INDEX



Staple crop production in Africa is predominantly rainfed, thus rainfall is the main determinant of food security on the continent. The *Africa RiskView* model uses the Water Requirements Satisfaction Index (WRSI) as its main drought index. The WRSI estimates the extent to which the water requirements of the crop have been met from the time of sowing to the time of crop maturity. This requires a number of input datasets including sowing dates, rainfall estimates, soil water holding capacity, crop types and their water demand. In order to determine if drought conditions at the end of a season are an anomaly, the WRSI at the end of a growing cycle is compared to a predefined benchmark.

DATA SOURCES

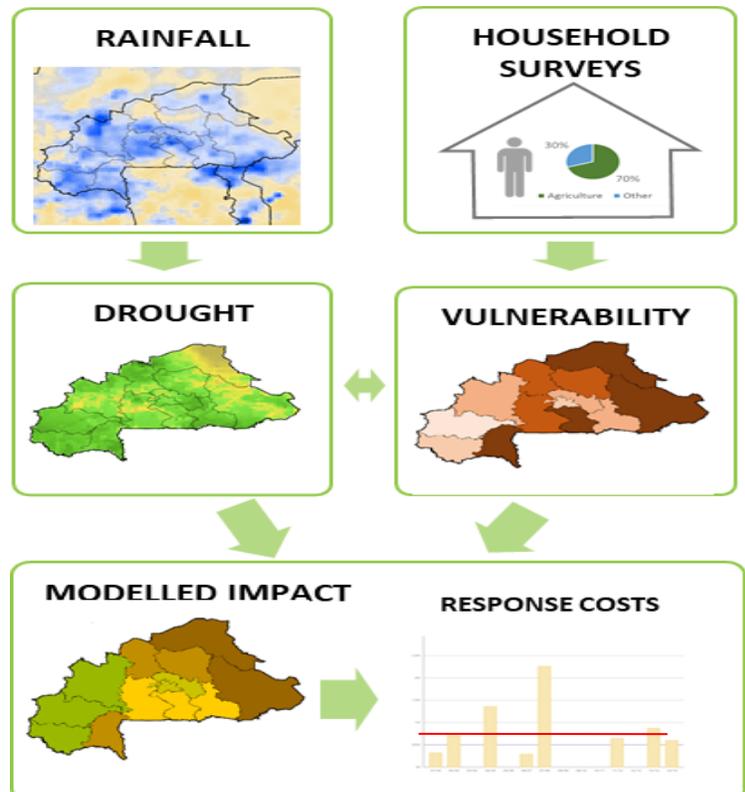
The *Africa RiskView* drought package uses several types of rainfall estimates including RFE2, the Africa Rainfall Climatology Version 2.0 (ARC2) provided by the U.S. Climate Prediction Center (CPC), and the TAMSAT African Rainfall Climatology and Time-series (TARCAT v2.0), produced by the University of Reading (UK), which are available starting from 1983 and are produced every ten days at the same spatial resolution of 0.1 by 0.1 degrees. NOAA also provides estimates of evapotranspiration, which are important in estimating water demand for crops. Sources for soil water holding capacity include the FAO Global Soils map and other national ancillary datasets.

VULNERABILITY

In order to estimate populations potentially affected by drought, a vulnerability profile of the country is required. The vulnerability profile is determined based on available household survey data from national government and the World Food Programme's Comprehensive Food Security and Vulnerability Analysis (CFSVA) surveys available in many countries, which provide information on the income-generating activities and wealth of households living within each geographic area. Vulnerability assessments are done outside the *Africa RiskView* model and are only used as input data into the model. The profiles are given for each "vulnerability polygon", which is a specific geographical unit within a country for which information on household vulnerability to drought exists and is statistically representative.

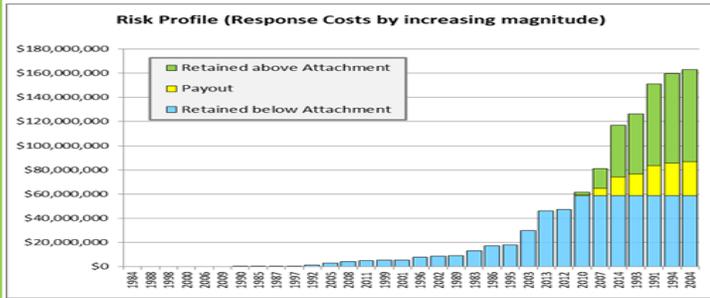
IMPACT ASSESSMENT

The drought model estimates numbers of people affected based on the vulnerability profile and the drought severity (deviation of the drought index from the benchmark established for each vulnerability polygon).



RISK TRANSFER

Analysis of historical data on response costs for different magnitudes of disasters allows the development of a risk profile for each country. The risk profile allows each country to consider different coverage options, possible payouts amounts



CUSTOMISATION OF DROUGHT MODEL

Country experts can customize the Africa RiskView model by choosing the type of rainfall estimates dataset which best suits their country and providing further information on crop types, sowing dates or criteria for estimating sowing dates, start and end of season dates, water holding capacity and percentage of effective rainfall, among others. They can also set the vulnerability profiles and benchmarks against which to

ADVANTAGES OF THE DROUGHT MODEL

The *Africa RiskView* model allows users to follow the progression of insured seasons in terms of agro-meteorological developments and in terms of impact on vulnerable populations in near-real time.

The model provides a forecast of end of season conditions, including the estimated number of people potentially affected by drought and makes this information available before the end of the season. Payouts are objectively and automatically triggered if specific thresholds (set by the country) are reached.

The long time series of historical datasets allows the analysis of drought risk since 1983, which can be used to develop national risk profiles.

The model represents a transparent and objective mechanism to quantify drought risks for all countries in the ARC Risk Pool.

TARGETED USERS

The software was intended for use by ARC risk analysts, governments of ARC Member States and partner organizations that have entered into a Software License Agreement with ARC. Access to the software is subject to the terms and conditions set forth in the Software License Agreement.

AFRICA RISKVIEW SOFTWARE SUITE

Africa RiskView software suite includes desktop applications and an online application accessible at www.africanriskview.org.

The online application gives users access to views of rainfall performance, the outputs of the drought model, including the drought index, estimated population affected and estimated drought response costs. It is also used for managing user registrations, assigning user rights and privileges, and managing software licenses.

The *Africa RiskView* drought desktop application, which is widely used by analysts and experts in ARC Member States, is a feature-rich application that offers extensive functionality for managing the Africa RiskView model, including customizing the model, importing custom datasets and exporting the results of the model to other formats as desired. It also features image and graph viewers which are particularly useful in monitoring the progression of the season and providing early warning for food insecurity.

The *Africa RiskView* drought application can be downloaded from <http://www.africanriskview.org/download.aspx>. Interested users can request licenses for the software by registering on the *Africa RiskView* website.

Africa RiskView Software	
<p>Africa RiskView Drought Desktop application and online application, www.africanriskview.org</p> <p>ArcCalculator Drought</p> <p>Flood Data Explorer</p> <p>Tropical Cyclone Explorer</p>	
	
User support systems	
<p>www.riskview.info</p> <p>User helpdesk Ticket System osTicket</p> <p>Help System MediaWiki</p>	<p>www.africanriskview.org</p> <p>User registration and management</p> <p>License management</p>
Servers and Databases	
 <p>Storage for Datasets, Country project settings, User information, License data</p>	

Software Development

The desktop applications are developed using Delphi, an object-oriented derivative of the Pascal programming language. The online application is developed using ASP.NET, an open-source server-side web application development framework designed to produce dynamic web pages.

The software is developed and maintained by ARC's in-house development team, in the Research and Development department.