

Terms of Reference of the *Africa RiskView* Technical Review Forum (TRF)

A. Background: About ARC

In 2012, the African Risk Capacity (ARC) was established by treaty as a Specialised Agency of the African Union (AU) to help Member States improve their capacities to better plan, prepare and respond to extreme weather events and natural disasters, therefore protecting the food security of their vulnerable populations. By linking early warning systems with contingency planning and supported by modern financial mechanisms, ARC enables governments to provide targeted responses to disasters in a more timely, cost-effective, objective and transparent manner, thereby reducing response costs and loss of livelihoods.

To date, the ARC Establishment Agreement has been signed by 33 countries across the continent, indicating the comprehensive endorsement of the work being undertaken by ARC as part of Africa's new climate and disaster management infrastructure. In 2014, member governments established the ARC Insurance Company Limited (ARC Ltd), the Agency's financial affiliate which is licensed as a mutual insurer, to manage the risk taken on through underwriting a pool of weather and other disaster risks. ARC Agency, an international organisation, and ARC Ltd, the dedicated sovereign risk insurance facility, comprise the ARC Group, which is listed on the OECD-DAC Annex 2 as a multilateral organisation for ODA scoring purposes.

Capitalised with US \$90m in risk capital from the British and German governments (based on a 20-year no-interest US \$200m loan), eight countries have purchased insurance from ARC Ltd and participated in the four drought risk pools since 2014. During this period, ARC Ltd has paid out a total of US \$36.8 million to drought-affected countries (US \$26 million to Senegal, Niger and Mauritania collectively in early 2015; US \$8 million to Malawi in early 2017; and US \$2.4 million to Mauritania in 2018). These payouts have gone towards assisting over 2.1 million people and over a million livestock.

B. *Africa RiskView* Software

ARC's proprietary weather modelling software, *Africa RiskView*, is the technical engine behind the ARC and the tool provided to ARC Member States to help them manage their weather risk and identify the appropriate amount of risk to transfer to the ARC Ltd risk pool.

Africa RiskView serves four purposes: a) as an underwriting tool for transactions with ARC Ltd; b) to assist decision makers in making critically aware, informed decisions about insurance their general investments in risk management; c) as an early warning tool for African governments; and d) to create a single, transparent System of Record for African drought, flood and cyclone risks with hazard, vulnerability and exposure information.

To date, the only operational product offered by ARC is drought risk coverage. For its drought product, *Africa RiskView* combines existing operational rainfall-based early warning models on agricultural drought in Africa with data on vulnerable populations to form a standardized approach for estimating food insecurity response costs across the continent.

Africa RiskView is designed to interpret different weather data, including rainfall and evapotranspiration estimates, as well as information on crops, such as soil and cropping calendars. This information is then converted into indicators for agricultural production and pasture and applied to the vulnerable populations with livelihoods are sensitive to drought and limited capacity to cope with shocks. *Africa RiskView* uses this information to estimate how many people may be directly affected (or have been affected) by drought or deficit rainfall in a given season. Using cost per affected person estimates, *Africa RiskView* estimates the response costs to the observed drought event.

To estimate drought, *Africa RiskView* currently uses the Water Requirement Satisfaction Index (WRSI). This index compares the amount of water available to the crop against its actual needs across all phenological stages of its growth. The WRSI is accepted and used widely in early warning platforms worldwide.

Countries can customise all parameters within *Africa RiskView* to define which portion of the modelled drought risk they wish to transfer to the ARC risk pool for each season. In turn, ARC Ltd uses *Africa RiskView* as a basis for its index-based insurance. ARC Ltd payouts are based on the quantification of the drought impact modelled by the software, and in case of poor rains, a disbursement of funds is triggered as soon as the season ends.

It is therefore key that *Africa RiskView* accurately models countries' drought risk and that the variability of output from the variability of input is explained and controlled to the largest extent possible.

For floods and other weather hazards for which ARC will offer insurance products in the future, different types of peril-specific indexes will be used and integrated into *Africa RiskView*.

C. Purpose of the Technical Review Forum (TRF)

Although the ARC Agency is already investing a considerable amount of resources and is succeeding in keeping its technical engine at a level that meets ARC Member State demand, additional support is required to help the ARC Secretariat take substantial developmental decisions in relation to *Africa RiskView*. Given the complex technical proficiency required to make sure that appropriate decisions are taken concerning peril-specific models in *Africa RiskView*, the ARC Agency Governing Board (the Board) has established an advisory committee, the ARC **Technical Review Forum (TRF)**, to support the continued improvement and refinement of the *Africa RiskView* model platform and its ability to reflect the impact of weather shocks on the ground. This will include providing technical guidance on issues such as model input data, model parameters and functionality improvements.

D. TRF Duties and Responsibilities for the *Africa RiskView* drought model

The main role of the TRF is to review and assess the current *Africa RiskView* drought model, as well as propose alternative methodologies and indicators to estimate the impact of drought on the crop yield and production. In this vein, the TRF will conduct:

- An extensive review of the WRSI model¹, its assumptions, parameters, and what is currently not captured by the model's specification;
- An evaluation of potential indicators that can validate the results of the WRSI model and/or replace and complement it;
- An evaluation of all input data and parameters to ensure *Africa RiskView* uses the most recent, available, and state-of-the-art data and processes;
- Recommendations to guide the incorporation of the effect of erratic rainfall, dry spells, consecutive lower-than-average rainfall seasons, and human behaviours, to the extent possible;
- Evaluations and recommendations of any new models or data streams that are applicable to the whole African continent and for which input data is freely available and in near real time (e.g. 2 days after the end of a ten-day period); and
- Evaluations and recommendations regarding drought classification criteria and references to determine drought severity and impact.

Although the core focus of the TRF will be on the ARC drought risk model, the TRF will also include a sub-group of experts who will concentrate on similar line of improvements for models for additional perils developed by ARC (i.e. flood and tropical cyclone)

E. Membership

The TRF will consist of an advisory committee of seven international drought modelling experts with experience in remote sensing, vulnerability analysis, and other relevant fields from leading academic institutions, international organisations, the private sector, and other areas. All members will serve in their individual, personal capacities and not as representatives of their organisations.

F. Terms of Service

Experts appointed to the TRF shall remain in service for a period of three years, renewable.

The appointment of the members of the TRF may be terminated at any time by the Board, or its Chair acting on the Board's behalf, if the interests of the ARC Agency so require.

G. Members Remuneration

Members of the TRF do not receive any numeration from the ARC Agency. However, when attending meetings by invitation of the ARC Secretariat, they shall be entitled to a daily

¹ <http://www.africanriskcapacity.org/2016/10/31/africa-riskview-methodology/>

honorarium and travel as established by the World Food Programme (WFP), ARC Agency's host organisation.

H. ARC Secretariat Roles and Responsibilities

Within the ARC Secretariat, the Research and Development department will facilitate the activities of the TRF and ensure that the TRF meets the requirements of the ARC Agency. Responsibilities of the ARC Research and Development department include:

- Planning, budgeting, and arranging logistics for the annual meeting of the TRF;
- Ensuring the composition of TRF expertise matches the areas outlined in the Terms of Reference; and
- Writing summary reports of TRF meetings to share with the ARC Secretariat.