

ARC Tropical Cyclone Risk Model

A parametric insurance product developed for the SWIO region to provide rapid financing and early response to countries affected by tropical cyclone events. It covers winds, storm surges and waves damages.

Overview

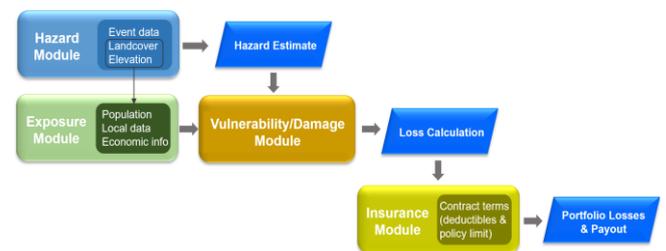
The Southwest Indian Ocean Region (SWIO) region is one of the most active areas in the world in terms of tropical cyclone (TC) formation. On average, 13 TC events with wind speeds exceeding 63 km/h form in SWIO region each year. High wind speeds are a key contributor to damage from TC.

Developments in the SWIO region in 2019, including the devastating effects of cyclones Idai and Kenneth in Mozambique, led to a renewed country interest in parametric tropical cyclone insurance coverage. Consequently, ARC partnered with Kinetic Analysis Corporation (KAC) to develop a model capable of accurately estimating the risk and losses due to tropical cyclone events adapted to the SWIO region where the interested ARC Member States are located.

The approaches applied were consistent with those used previously to support the Caribbean Catastrophe Risk Insurance Facility (CCRIF) for a parametric risk pool covering the Caribbean and Central America regions. TC hazard and loss modelling techniques applied to ARC model have been extensively reviewed and accepted for underwriting use by the reinsurance and capital markets.

ARC's TC model covers winds, storm surges and waves hazards while excess rainfall associated with cyclones will be covered under another ARC insurance product dedicated to flooding due to the complexity of combining the rainfall hazard with the other TC hazards. The ARC TC model uses storm

tracks and intensity produced by the US Joint Typhoon Warning Centre for the period 1983-2013. The ARC TC model combines characteristics of cyclone events hazard with exposure and vulnerability data to model the population affected and the economic losses. Using an insurance model and specific contract terms, exposure loss estimates are translated into loss estimates for a portfolio of assets. Losses calculations are currently available for Madagascar, Mozambique, Comoros, Mauritius, Seychelles and Tanzania.



The ARC TC model satisfactorily addresses a very difficult problem with a robust loss calculation algorithm. It is reasonably robust and effective in terms of depicting the risks associated with tropical cyclone events and assessing damage and loss. The TC model is mature enough to be used operationally by ARC for parametric insurance in the SWIO region.

-Technical Review Forum

After a satisfactory assessment in July 2020 by a Technical Review Forum (TRF) composed of high-level TC experts from globally renown institutions, the ARC Tropical Cyclone risk model was deemed ready and that it can be confidently used for underwriting insurance policy starting with the 2020-2021 TC season.

A dedicated interface, ARC *Tropical Cyclone Explorer* (ARC TCE) software package, has been developed to allow easy access by users to the full set of model data and visualize the results. The TCE will be available to ARC Member States and partners via the ARC's Africa RiskView (ARV) platform.