

Highlights

- Following FREDDY's landfall on the east coast of Madagascar, more than 116,700 people were affected, over 37,700 people displaced and 7 people dead according to the latest update from the Malagasy National Disaster Management Agency (BNGRC).
- The ARC's Tropical Cyclone model has identified more than 2 million people exposed to windspeeds above 118 km/h.
- Modelled economic losses due to FREDDY in Madagascar are estimated at USD481,461,198 by ARC's TCE. This amount has exceeded the Attachment Point indicated in Madagascar's TC policy. As a result, a payout of USD1,203,909 is due to the Government of Madagascar under the 2022/23 parametric insurance policy against the risks of tropical cyclones.

Overview of the Cyclonic Event

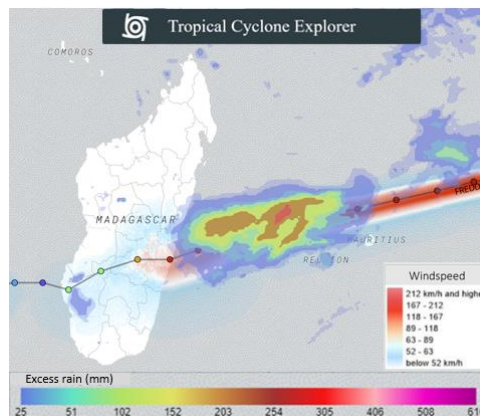
The very intense tropical cyclone FREDDY was a powerful and long-lasting cyclonic event that affected Mauritius, Reunion, Madagascar and Mozambique. FREDDY first developed as a tropical disturbance on February 3, 2023 in the Australian Basin and quickly intensified into a severe tropical cyclone. FREDDY was the second tropical cyclone to hit Madagascar in 2023 after CHENESO, and one of three systems to cross the entire Indian Ocean region from east to west, the others being cyclones Eline and Hudah in 2000¹. On February 19, Météo-France reclassified it as a very intense tropical cyclone. FREDDY made landfall on the east coast of Madagascar, near Mananjary, on February 21, with sustained winds of 130 km/h, and gusts of 185 km/h². It quickly weakened inland but strengthened again in the Mozambique Channel on February 22.



The provisional assessment carried out on February 27, 2023, by the Malagasy National Disaster Management Agency (BNGRC) reports more than 116,700 people affected, over 37,700 people displaced and seven confirmed fatalities dead in seven regions across central and southern Madagascar³. In addition, over 9,700 houses and more than 300 schools have been destroyed. Ahead of FREDDY's arrival, BNGRC pre-emptively evacuated 7,000 people in the coastal region who were in the storm's path, while school and public transportation were suspended. FREDDY followed a similar path to cyclone BATSIRAI which made landfall near Mananjary city a year ago.

Monitoring of FREDDY by the ARC TCE

As part of the ARC Parametric Tropical Cyclone Insurance Policy, a post-event loss report is required for any cyclone event affecting a Member State with windspeeds greater than 63 km/h. The ARC's online Tropical Cyclone Explorer (TCE)⁴ software enabled real-time monitoring of the characteristics of the tropical cyclone FREDDY in Madagascar. Wind, storm surge and excess rain footprints are among the products generated by TCE, and these indicate the areas affected by FREDDY.



TCE estimated that sustained winds ranged from 167 km/h to 74 km/h before the cyclone made landfall and left Madagascar respectively. The maximum storm surge was estimated at 1.69 m by TCE, while excessive rainfall exceeded 200 mm in some areas near the impact zone.

Economic Losses and Population Exposed

TCE's calculations showed that a total of 7,844,507 people lived in the areas affected by FREDDY, of which 2,202,461 were exposed to windspeeds above 118 km/h (Table below). The economic losses associated to the cyclone FREDDY were estimated at USD481,461,198 in Madagascar. These losses are direct losses solely due to winds hazard and storm surges, and do not consider damages due to excess rain/flooding, nor indirect economic losses.

Country	Event name	Losses (USD)	Number of population potentially exposed per windspeed categories				
			Category 1 (≥ 63 km/h)	Category 2 (≥ 89 km/h)	Category 3 (≥ 118 km/h)	Category 4 (≥ 166 km/h)	Category 5 (≥ 212 km/h)
Madagascar	FREDDY	481,461,198	3,768,308	1,873,738	2,191,766	10,695	0

Tropical Cyclone Insurance Policy

The payout under the TC parametric insurance policy held by a country depends on the conditions of coverage chosen. A key parameter is the Attachment Point, the minimum severity of the event loss that results in a payout.

For Madagascar, the calculation of the payout per the insurance model, in relation to the wind and storm surge risks associated with FREDDY, was carried out using the following risk transfer parameters from Madagascar's TC insurance contract: Aggregate Limit of USD10,779,300, Attachment Point of USD164,643,130 and Exhaustion Point of USD3,001,301,024. The calculation results showed that the losses caused by FREDDY have exceeded the Attachment Point indicated in the contract.

As a result, a payout of USD1,203,909 is due to the Government of Madagascar under the 2022/23 parametric insurance policy against the risks of tropical cyclones with the above parameters.

The ARC Group expresses its sympathy to the Government and people of Madagascar for the impacts on communities and infrastructure caused by the tropical cyclone FREDDY.

For additional information, contact us at: info@arc.int

¹ Duff, R. (2023). Madagascar on alert for direct strike from long-lived cyclone Freddy. UPI. Accuweather.

² Météo-France

³ ECHO Daily Flash of 27 February 2023

⁴ <https://tce.arc.int>