

= Cyclone Geralda =

Cyclone Geralda (also known as Intense Tropical Cyclone Geralda) was a powerful tropical cyclone that caused catastrophic damage in Madagascar in late January 1994 , among the strongest to hit the country . It originated from an area of low pressure over the Indian Ocean on January 25 . Over the following few days , the depression underwent gradual intensification , reaching its peak intensity with ten @-@ minute sustained winds of 200 km / h (125 mph) on January 31 . Cyclone Geralda made landfall near Toamasina , Madagascar after weakening from its peak intensity . Within hours of moving onshore , the system had substantially weakened , and by February 5 , Geralda had degenerated into a land depression , and it became extratropical three days later .

Geralda was the second cyclone in as many months to strike eastern Madagascar , after Daisy in January . Geralda produced wind gusts as strong as 350 km / h (220 mph) , which were the highest worldwide for several decades . The cyclone also dropped heavy rainfall that caused flooding , particularly in valleys . About 80 % of the city of Toamasina was destroyed , including most schools , homes , and churches . The cyclone heavily damaged roads and rail lines , which later disrupted relief efforts . In the capital Antananarivo , Geralda killed 43 people after flooding many houses . Overall , more than 40 @,@ 000 homes were destroyed , leaving 356 @,@ 000 people homeless . Nationwide , the cyclone killed 231 people and caused over \$ 10 million in damage (1994 USD) . Relief work in the storm 's aftermath was hampered by lack of coordination , and the Malagasy military were deployed to help storm victims . Few stocks were pre @-@ positioned , causing food prices to rise greatly . Several countries and departments of the United Nations donated money or supplies to the country .

= = Meteorological history = =

In late January 1994 , the south Indian Ocean Intertropical Convergence Zone produced widespread convection from the eastern coast of Africa to Indonesia . Late on January 25 , the Joint Typhoon Warning Center (JTWC) began monitoring a low @-@ pressure area about halfway between Madagascar and Indonesia , later giving it the designation " 13S " . The following day , the Météo @-@ France on Réunion (MFR) classified the system as a tropical disturbance . By that time , the system had developed an organized area of convection with curved rainbands and was strengthening quickly ; early on January 28 , it developed a central dense overcast . In response , MFR upgraded the system to Moderate Tropical Storm Geralda . At that time , the storm was moving generally west @-@ southwestward due to a ridge extending from Madagascar to the Mascarene Islands . High water temperatures fueled further development , first into a moderate tropical storm late on January 28 and then into a tropical cyclone 24 hours later . By then , the JTWC had upgraded Geralda to the equivalent of a minimal hurricane .

Continuing generally to the west @-@ southwest , Geralda intensified further , and MFR upgraded it to intense tropical cyclone status on January 30 . The cyclone developed a well @-@ defined eye 35 km (22 mi) in diameter and grew to a size of 1 @,@ 000 km (620 mi) in diameter . At 0600 UTC on January 31 , the JTWC estimated peak 1 ? minute sustained winds of 270 km / h (165 mph) , equivalent to a Category 5 hurricane on the Saffir @-@ Simpson scale . Six hours later , Geralda 's appearance on satellite imagery warranted a Dvorak rating of 7 @.@ 0 . Based on this , MFR estimated a minimum barometric pressure of 905 mbar (26 @.@ 7 inHg) and peak 10 ? minute winds of 205 km / h (125 mph) , just shy of very intense tropical cyclone status . At that time , gusts were estimated at over 300 km / h (190 mph) . Geralda had intensified from a tropical disturbance to its peak intensity in only five days , which was described by MFR as " an exceptional phenomenon " . Near peak intensity , the center of Geralda passed about 45 km (28 mi) northwest of Tromelin Island , offshore eastern Madagascar .

After maintaining its peak winds for about 18 hours , Geralda weakened slightly while approaching eastern Madagascar . At 0600 UTC on February 2 , MFR estimated the winds were around 175 km / h (110 mph) . At about 1100 UTC that day , the cyclone made landfall just north of Toamasina as

an intense tropical cyclone , where a pressure of 943 mbar (27 @. @ 8 inHg) was reported . Officials considered Geralda the strongest storm to hit the country since a cyclone in March 1927 . Geralda weakened rapidly over the mountainous terrain of Madagascar , passing over the capital Antananarivo late on February 2 ; both the JTWC and MFR had downgraded the cyclone to tropical depression status by the next day . About 30 hours after its first landfall , Geralda briefly emerged into the Mozambique Channel late on February 3 . However , a trough soon turned it to the south , and Geralda crossed over western Madagascar , reaching open waters on February 5 . By that time , the winds had decreased to 45 km / h (30 mph) . An approaching polar trough turned Geralda to the southeast on February 6 , and the cyclone became extratropical two days later . MFR continued tracking the remnants of Geralda until February 12 .

= = Impact and aftermath = =

Tromelin Island was the first landmass affected by Geralda . The island was just outside the eyewall , and experienced wind gusts of 180 km / h (110 mph) .

Cyclone Geralda struck Madagascar just weeks after Tropical Cyclone Daisy affected the same general area . While Geralda was approaching the country , officials declared Emergency Phase 3 for Toamasina Province , indicating immediate danger , and Emergency Phase 1 for Antananarivo , which is a general alert .

As Geralda moved ashore , the cyclone produced wind gusts as strong as 350 km / h (220 mph) , among the strongest gusts worldwide in several decades . The storm also dropped heavy rainfall that caused landslides and severe flooding , mostly in Toamasina Province . About 80 % of the city of Toamasina was destroyed , including the country 's only petroleum refinery at the time . Damage to the refinery alone was estimated at \$ 800 @, @ 000 .

An early estimate indicated that 95 % of schools , homes , and churches sustained severe damage to complete destruction in the city , leaving 50 @, @ 000 people homeless . In the harbor at Toamasina , Geralda sank seven ships , and throughout the city , power outages and road damage were commonplace . Elsewhere in Madagascar , Geralda wrecked houses and bridges in Fénérive . On Île Sainte @- @ Marie , all power lines and 90 % of plantations were destroyed . Brickaville , to the south of Toamasina , experienced severe flooding up to 3 m (9 @. @ 8 ft) deep . Lack of basic repairs before the storm contributed to roads and bridges being washed away there . The cyclone killed 43 people when it flooded large portions of Antananarivo , leaving 60 @, @ 000 people homeless . High rainfall damaged houses in the city and cut off roads outside of the city . Damage was heavy in valleys where flash flooding occurred . Across Madagascar , flooding wrecked over 300 @, @ 000 ha (740 @, @ 000 acres) of crop fields , affecting 70 % of the rice crop , and killed more than 13 @, @ 000 cattle . The combined impact of Geralda and earlier Cyclone Daisy damaged or destroyed more than 40 @, @ 000 homes , leaving at least 356 @, @ 000 people homeless . The storms also left severe damage to roads and rail systems . A total of 20 national roads and several secondary roads were disrupted . The rail line between Moramanga near the capital and Brickaville near the coast was damaged . Overall , Cyclone Geralda killed at least 231 people , with 73 missing as of MFR 's annual cyclone report on the season ; the storm also injured 267 people and caused over \$ 10 million in damage (1994 USD) .

In the aftermath , there was no pre @- @ existing method of dealing with a storm of such magnitude , and most local governments failed to respond immediately due to lack of coordination . As a result , agencies spent much time in dealing with the logistics of the aftermath . There were few food supplies that were pre @- @ positioned . The Malagasy government worked with the United Nations to create a committee , which met weekly and addressed various facets of the recovery . Malagasy officials deployed members of the military to help storm victims , although damaged roads initially hampered relief efforts . Due to crop damage , the price of rice increased by 300 % in the country , and there were food shortages in Antananarivo , along with fuel shortages elsewhere . In Toamasina , industrial activity was expected to take six months to resume production . Médecins Sans Frontières helped assure the cleanliness of shelters in Antananarivo , while CARE delivered food to residents in Brickaville . There were health issues related to the widespread flooding ,

prompting the government to distribute medical supplies for 60 @, @ 000 people . Shortly after Geralda struck , the Malagasy government requested international assistance . The United Nations Department of Human Services provided an emergency \$ 30 @, @ 000 relief grant , and UNICEF later provided about \$ 2 @. @ 3 million in assistance . The European Union provided about \$ 560 @, @ 000 worth of medicine and relief . The French government sent \$ 5 million worth of supplies via airplane from Réunion , including food and medicine . Eight other countries sent assistance in the form of money or relief items .

By about two weeks after the storm 's landfall , water and power service were being restored in Toamasina , although by that time , 40 % of the communications network remained offline . By February 16 , the road from Antananrivo and Toamasina had been reopened . The Malagasy government imported oil for several months while its refinery was out of order . Non @- @ government organizations provided rice to stabilize prices . The damaged rail line between Antananarivo and the coast was rebuilt in 2003 . Schools that were repaired following Geralda were later successfully used as shelters .