

SUMMARY

TC Idai initially made landfall in Mozambique as a tropical storm causing flooding in the Tete and Zambezia provinces on ____ March. Idai then moved back out to sea, gathered strength and returned to Mozambique on the night of 14/15 March as a tropical cyclone, with a strength equivalent to a category 3 hurricane. The cyclone made landfall very close to Beira, Mozambique's fourth largest city with a population of 500,000. The cyclone then moved across the central part of the country.

The storm lingered for several days over Zimbabwe and Malawi causing heavy rains every day. The relentless rainfall caused several rivers to overflow downriver in the more low-lying Mozambique leading to widespread flooding, estimated through satellite imagery analysis on 20 March to cover 50,000.

A multi-agency rapid aerial assessment was conducted from 24-29 March, under the co-leadership of Mozambique National Disasters Management Institute (INGC), International Federation of Red Cross Red Crescent Societies (IFRC) and the United Nations Disaster Assessment and Coordination (UNDAC). The survey was initiated to:

- 1. Prioritise tasking for critical incidents
- 2. Estimate overall severity
- 3. Estimate geographic extent of affected area
- 4. Assess and geolocate points of interest

Over 1,000 geotagged images and initial estimates of severity have been collected, three quarters of which in the first three days, and made available for the humanitarian community to use for analysis and planning.

An interactive web map providing access to all images and data is available on the IFRC GO platform, (https://go.ifrc.org/emergencies/3469). Static maps available from MapAction's map portal (maps.mapaction.org/mozambique). Raw data available on OCHA's Humanitarian Data Exchange portal, HDX (https://bit.ly/2I5aADE)

KEY FINDINGS

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- Four geographic zones of greatest concern
 - 1) Greater Beira area and surrounding lowlands
 - 2) Foot of mountains on Mozambique Zimbabwe border where fast-flowing mountain rivers fanned out
 - 3) Buzi river basin
 - 4) Coastal areas
- **Moderate wind damage** suggests that the main impacts are a result of accumulated rainfall and downstream flooding
- **Crop damage, particularly of maize, is of great concern** further agronomic assessments are urgently required to assess scale of damage, amount of seeds and crops salvaged by farmers and potential to take advantage of saturated ground for planting of rapidly growing varieties of maize and beans
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Flooding has receded since the peak and few households were identified which were still under standing water as of 28 March Key infrastructure has largely been rehabilitated and so large-scale delivery of aid by road is possible for the majority

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Search and rescue phase had ended before the initiation of the survey. While urgent needs remain, particularly in food security, health, shelter, WASH and livelihoods there were no strande communities found during the aerial survey.



Extensive shallow landslides in upper catchments of mountain rivers in the highlands to the east of the affected area (Moz-Zim border) with channelised debris flows that affected villages.





FURTHER USES



Common situational awareness of affected areas and scale of need, including images to remotely verify and assess impacts



Key resource for **prioritisation of ground assessments**, including the INGC/IFRC/UNDAC multi-sectoral rapid assessment



Targeting aid distributions, including provision of coordinates and images for orientation



Informing the locations of operational hubs – likely that Beira will remain the focal point base of operations but consideration should be given to forward bases in the other four zones of greatest observed impact listed above

Identification of points of interest, including accommodation centres containing displaced people, schools and damaged infrastructure such as bridges and roads.

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While there was only one **critical incident** reported during the aerial survey, the system of reporting, tasking and delivery of humanitarian assistance worked effectively. Within two hours a community judged to be in a critical situation with an estimated population of 500 individuals (Grid square G6) were delivered 1 tonne of food, shelter and other Non-Food Items using air assets, as well as the health of the affected population assessed by medical professionals

FACTS AND FIGURES



Identified three damaged bridges, two of which were critical and one severely damaged



One critical incident reported for immediate tasking



864 points in the first three days (76%) giving a rapid and prioritised view of the geographic extent for early decision-making

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102 grids assessed covering an area roughly three times the size of the Serengheti, enabling a common situational overview

TIMELINE



Chart displays number of points of interest recorded each day, with ³/₄ being collected over the first three days, 24-26 March, when floodwaters were still near their highest point

Mozambique: Cyclone Idai - results and analysis of aerial survey as of 29th March 2019

MA023 v09





International Federation of Red Cross and Red Crescent Societies









ANALYSIS

Comparison of severity category against estimated population



Number of points of interest collected for each point of interest



Chart shows the distribution of points of interest across the different categories, with the majority of points collected being houses / communities

Chart shows the distribution of severity across estimated population of the point of interest.



MOZAMBIQUE - TC IDAI Aerial Assessment Report



TIMEFRAME



Graphic shows the prioritisation of aerial assessment according to first satellite detected flood waters, storm track and then comprehensiveness





METHODOLOGY

The novel use of a grid system and electronic data capture process enabled common analysis of a standardised dataset the size of 20km x 20 km grid squares was set as it was judged that it would be possible to provide an overview of each grid square from the centre point to inform further investigation. Given competing priorities for delivery of aid using air assets, a balance was struck between greater coverage and detail The data collection form used KoBo (https://kobo.humanitarianresponse.info) form with 5 steps:

- Location (GPS coordinates and grid square)
- Image
- Point of interest
- Severity
- Critical incident reporting

Aerial assessments were conducted by two person inter-agency teams over 5 day periodWhile the assessment teams predominantly used Squirrel helicopters, a Bell 412EP helicopter and fixed wing planes were also used to survey lower risk areas

• Pilots navigated to the centre of the grid square and then assessment of the grid square area for further detailed investigation was made

• Enumerators kept in contact during the aerial data collection process. After each grid square a check-in was used to calibrate the severity scoring. During the analysis process, IFRC and MapAction checked the calibration scores against the aggregated scores for each point of interest within grid squares.

• The ACAPs severity ranking was used. While dependent on subjective assessments this was appropriate for the context and situation.

• Purposive sampling approach – main purpose is to get a quick overview.

• Analysis and data processing was conducted in R using the sf package and the tidyverse. This allowed for multiple updates per day to be processed in an expedient timeframe. Map products were created in ArcGIS.

LIMITATIONS

• Aerial survey is deemed inappropriate for crop damage assessments. Recommendations have been made to the Food Security cluster to complete this complementary survey as a matter of priority

• While the grid squares give an impression of 100% coverage of the area surveyed, the points of interest were captured as representative and not comprehensive. Any aggregation of the data would need to bear this in mind.

• Humanitarian experts from INGC, IFRC, UNDAC, MapAction, IHP and MSF contributed to the data, however there was no prior training provided, meaning that results might not be calibrated between the enumerators. There will inevitably be an impact from human bias and variation in subjective severity scoring

• The KoBo form was produced rapidly and so therefore, while appropriate for the context, it could be optimised for more consistent data capture

• ³/₄ of data was collected over the first three days of the assessment giving a picture of damage and needs which will change over the coming days as floodwaters recede, populations move and gather in new accommodation centres and secondary impacts emerge, including in health. Even over the 5 day assessment period observed conditions may have change; this was mitigated by publishing interim results twice daily

• There are always limitations on detailed assessments when conducting this aerially. However 70% of observations were from less than 500 metres altitude as Squirrel helicopters were used for the majority of the recces.



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• Report authors: Luke Caley (IM analyst, IFRC) and Christopher Jarvis (Data scientist and volunteer, MapAction, London School of Hygiene and Tropical Medicine)