

## PROJECTING THE ECONOMIC IMPACT OF CYCLONE IMAI ON BEIRA PORT, MARITIME SUPPLY CHAIN AND COMMUNITY, 19 MARCH 2019, JACK DYER, NOTES

Dear Esteemed Customers

On the 14<sup>th</sup> March the Central regional of Mozambique and most particularly the city of Beira were heavily affected by Cyclone IDAI. There has been extensive wind and water damage to the city and surrounding area with loss of lives, property and no electricity and water available.

The Port was well prepared in advance and thus has sustained only limited damages.

On the General Cargo Terminal, the warehouses have suffered severe roof damage and are out of order for the next month at least. The Fenders on the quays were swept away but replacements are being installed now and this afternoon we will have two quays fully functional, with a third expected to be ready tomorrow. All major debris has been removed from the terminal and the Terminal is fully accessible. Equipment was stored safely and is operational.

On the Container Terminal, no full containers were damaged as they were stacked low or in pyramid shape. The Gantry Cranes have withstood the storm well thanks to extensive tie down efforts. The single lift cranes have suffered damage to the engine housing and repairs will still take a few days or longer. The two twin lift cranes have only had problems with water infiltration via the AC system and after drying out, they are expected to be operational this afternoon. Our NAVIS operating system is running in the office, and work to reestablish functionality on the terminal is expected to be concluded this afternoon. We will then be fully operational again later this afternoon.

The BGT Terminal has some damages to the Silos but the conveyor system is intact, after dealing with water related problems the Terminal is expected to become operational in a few days.

The Road to Beira is currently not accessible due to the flooding around 100km away from Beira, only once the water has lowered will we have an idea of the time required for the road to be transitable again.

Communication in Beira is still difficult, we are relying on VSAT for internet and phone calls are complicated. Voice services are expected to be reestablished in the next few days, up to then email will work reliably as a means of communication.

Best Regards

Cyclone Idai

- From Wikipedia, the free encyclopedia
- [Jump to navigation](#)[Jump to search](#)
- Intense Tropical Cyclone Idai
- Intense tropical cyclone (SWIO scale)
- Category 3 tropical cyclone (SSHWS)
- Idai 2019-03-14 1135Z.jpg
- Idai approaching Mozambique shortly after peak intensity on 14 March
- Formed 4 March 2019
- Dissipated 16 March 2019
- Highest winds 10-minute sustained: 195 km/h (120 mph)
- 1-minute sustained: 205 km/h (125 mph)
- Gusts: 280 km/h (175 mph)
- Lowest pressure 940 hPa (mbar); 27.76 inHg
- Fatalities 314 total[nb 1][nb 2]
- (possibly >1,000 total)[5]
- Damage > \$7 million (2019 USD)
- Areas affected Mozambique, Malawi, Madagascar, Zimbabwe, South Africa
- Part of the 2018–19 South-West Indian Ocean cyclone season
- 

Intense Tropical Cyclone Idai was the strongest tropical cyclone to strike Mozambique since Jokwe in 2008 and the deadliest tropical cyclone worldwide in 2019. The tenth named storm and record-breaking seventh intense tropical cyclone of the 2018–19 South-West Indian Ocean cyclone season, Idai originated from a tropical depression that formed off the eastern coast of Mozambique on 4 March. The depression made landfall in the aforementioned country later in the day and remained a tropical cyclone throughout the entirety of its trek over land. On 9 March, the depression reemerged into the Mozambique Channel and was upgraded into Moderate Tropical Storm Idai next day. The system then began a stint of rapid intensification, reaching an initial peak intensity as an intense tropical cyclone with winds of 175 km/h (110 mph) on 11 March. Idai then began to weaken due to ongoing structural changes within its inner core, falling to tropical cyclone intensity. Idai's intensity remained stagnant for about a day or so before it began to re-intensify. On 14 March, Idai reached peak intensity with maximum sustained winds of 195 km/h (120 mph) and a minimum central pressure of 940 hPa (27.76 inHg). Idai then began to weaken as it approached the coast of Mozambique due to less favorable conditions. On 15 March, Idai made landfall near Beira, Mozambique, as an intense tropical cyclone.

Idai brought strong winds and caused severe flooding in Madagascar, Malawi, Zimbabwe, and Mozambique that has killed 314 people—150 in Mozambique, 98 in Zimbabwe, 56 in Malawi, 7 in South Africa, and 3 in Madagascar—and affected more than 1 million others. Catastrophic damage occurred in and around Beira in southern Mozambique. The President of Mozambique stated that more than 1,000 people may have died in the storm.[5]

## Contents

- 1 Meteorological history
- 2 Effect
  - 2.1 First landfall
  - 2.2 Second landfall
- 3 Aftermath
- 4 Notes
- 5 See also
- 6 References
- 7 External links

## Meteorological history

Map plotting the track and the intensity of the storm, according to the Saffir–Simpson scale

Cyclone Idai originated from an elongated circulation that the Météo-France office on Réunion (MFR) began monitoring on 1 March. At that time, it was located in the Mozambique Channel and was moving west-southwest, towards Africa's eastern coast.[6] The MFR continued to track the system over the next couple of days as it developed strong deep convection.[7] On 4 March, the MFR stated that Tropical Depression 11 had formed off the eastern coast of Mozambique.[8] The depression slowly moved westward, making landfall in Mozambique later in the day.[9] The depression retained its status as a tropical cyclone throughout its entire existence over land. Shortly after landfall, the system turned to the north. Over the next few days, the depression performed a loop near the border of Malawi and Mozambique,[10] before turning eastward and reemerging into the Mozambique Channel.[11] On 8 March, at 22:00 UTC, the Joint Typhoon Warning Center (JTWC) issued a tropical cyclone formation alert (TCFA), noting a consolidating low-level circulation center and that the system was located in a favorable environment with low wind shear and sea surface temperatures of 30 °C (86 °F) to 31 °C (88 °F).[12] On 9 March, the JTWC issued its first warning on the system, classifying it as Tropical Cyclone 18S.[13] At 00:00 UTC on 10 March, the MFR upgraded the system to a moderate tropical storm and designated it as Idai, after an increase in organised convection and the development of banding features occurred.[14] Idai then began a period of rapid intensification, with the MFR upgrading it to tropical cyclone status by 18:00 UTC. At the same time, the JTWC upgraded it to the equivalent of a Category 1 hurricane on the Saffir–Simpson scale.[15] Additionally, the strengthening of a subtropical ridge to the southwest and the weakening of the Intertropical Convergence Zone to the north resulted in a decrease in forward motion.[16] Around 12:00 UTC on 11 March, Idai reached its initial peak intensity as an intense tropical cyclone with 10-minute maximum sustained winds of 175 km/h (110 mph). At that time, the MFR reported that the internal structure

of the cyclone had improved, with an eye visible in infrared imagery.[17] Meanwhile, the JTWC estimated 1-minute winds of 195 km/h (120 mph), the equivalent of a Category 3 hurricane.[18]

### **Tropical Depression 11 moving ashore in Mozambique on 4 March**

Soon after, Idai began a weakening trend as it entered an eyewall replacement cycle and experienced dry air entanglement.[19] It was also noted that Idai was tracking towards the southwest, under the increasing influence of the subtropical ridge.[20] On 12 March at 06:00 UTC, Idai bottomed out at tropical cyclone status with 10-minute winds of 130 km/h (80 mph). At that time, the MFR noted that Idai had a poorly defined eye as the eyewall replacement was still underway.[21] Over the next day, Idai's intensity changed very little due to ongoing structural changes within its inner core. At the same time, Idai began to travel in a westerly direction.[22] By 18:00 UTC on 13 March, Idai had developed a large eye and taken on the characteristics of an annular tropical cyclone.[23] Six hours later, Idai reached peak intensity with 10-minute maximum sustained winds of 195 km/h (120 mph) and a minimum central pressure of 940 hPa (27.76 inHg).[24] At that time, the JTWC also reported Idai had reached peak intensity, with 1-minute sustained winds of 205 km/h (125 mph).[25] Soon after, Idai began to weaken due to lower sea surface temperatures and vertical wind shear as it neared the coast of Mozambique.[26] At 00:00 UTC on 15 March, the MFR reported that Idai had made landfall near Beira, Mozambique, with 10-minute sustained winds of 165 km/h (105 mph).[27] Shortly afterward, the JTWC issued its final warning on Idai, stating that the cyclone had diminishing eyewall convection and warming cloud tops.[28] Idai quickly weakened after landfall; at 06:00 UTC that day, the MFR declared that Idai had degenerated into an overland depression, with gale-force winds as it continued to move inland.[29] Six hours later, the MFR issued its last warning on Idai. At that time, it was forecasted that Idai's circulation would persist for several more days, and would drop heavy rainfall throughout the region during that time.[30] The MFR continued to monitor Idai for the next few days, noting on 17 March that only a wide, clockwise circulation remained over eastern Zimbabwe, however rain was still affecting the entire region.[31]

### **Effect**

Flooding in Tete, Mozambique, inundated numerous houses after Idai made its first landfall

Idai caused severe flooding throughout Madagascar, Malawi, Mozambique, Zimbabwe, and South Africa. Idai and its precursor low pressure system caused 314 deaths in southern Africa.

While over the Mozambique Channel, the system brought heavy rains to northwestern Madagascar, with localized accumulations of approximately 400 mm (16 in). Flooding and mudslides killed 3 people, affected 1,100 others, and damaged 137 homes.[32]

### **First landfall**

In Mozambique, flooding from the low killed 66 people and injured 111 more. It was reported that 5,756 homes were destroyed, while another 15,467 homes were affected. Additionally, eight hospitals and 938 classrooms were destroyed. The floods also ruined 168,000 hectares (420,000 acres) of crops.[1] The government requested 1.1 billion meticaís (US\$17.6 million) to provide aid for flood victims.[33]

In Malawi, 56 people were reported dead and 577 others were reported injured as a result of flooding.[34] Malawi government needed \$16.4 million to ease the damage due to flooding.[35]

Three days of persistent rain triggered flooding in eastern South Africa, primarily in KwaZulu-Natal. At least seven people died in Ntuzuma, Inanda, KwaMashu, and Verulam. The majority of the victims died from drowning in swollen rivers.[2][36] Damage across KwaZulu-Natal reached R100 million (US\$7 million).[2]

### **Second landfall Idai making its second landfall in Mozambique on 15 March**

Striking Mozambique near Beira, Idai produced a storm surge of 4.4 m (14 ft) in the city. Coupled with torrential rains, disastrous flooding ensued in the region.[32] More than 500,000 people in the city, the majority of the population, lost power.[37] Rainfall in the city exceeded 200 mm (8 in), while the heaviest totals of more than 600 mm (24 in) fell near Chimoio.[32] It was reported that a total of 84 people in Sofala Province were killed,[3] including a child who was struck and killed by debris.[38] More than 1,500 people were treated for storm-related injuries, primarily from airborne debris, in hospitals across Beira.[3][5] The IFRC reported that 90% of the area in Beira was totally destroyed.[39] The International Federation of Red Cross and Red Crescent Societies described damage in the region as "massive and horrifying" and the President of Mozambique stated that over 1,000 people may have died. Bodies were found floating in floodwaters in Beira days after the storm hit.[5] Days after landfall, the Pungwe and Buzi rivers in central Mozambique overtopped their banks.[40] Heavy rains fell across much of eastern Zimbabwe as the cyclone meandered along the nation's border with Mozambique. The heaviest rains fell in the Chimanimani District, with accumulations reaching 200–400 mm (8–20 in).[32] Widespread flash flooding ensued, claiming at least 98 lives and leaving numerous others missing.[4][41] The Chimanimani and Chipinge districts saw extensive damage with widespread flash flooding. The Nyahonde River burst its banks and inundated numerous communities. Destruction of numerous bridges and roads in eastern Chimanimani isolated many residents.[42]

### **Aftermath**

The United Nations and their partners appealed for \$40.8 million as an emergency relief to help those people who were affected by Idai in Mozambique.[43] UNICEF estimated that about \$10 million is required for the most urgent needs of children.[44] The South African National Defence Force provided aerial and ground assistance to relief efforts in Malawi and Mozambique starting on 16 March.[45] Zimbabwe President Emmerson Mnangagwa declared a state of emergency soon after the storm and deployed the National Army and Air Force. A command center was established in Harare by 17 March to coordinate rescue and relief efforts. Persistent heavy rain, continued flooding, and mudslides hampered relief efforts, leaving many residents stranded without assistance. Harare Councilor Jacon Mafume called the event a

"serious humanitarian crisis" and called upon the state for "intervention on a massive scale to avoid biblical disaster".[42]

## Notes

Approximately 129 deaths occurred in Malawi, Mozambique, and South Africa from the flooding that preceded Idai's second landfall.[1][2] At least 84 deaths occurred in Mozambique and 98 in Zimbabwe after Idai made its second landfall.[3][4]

See also

- Tropical cyclones portal
- Cyclone Leon–Eline – Storm that affected similar areas in 2000, killing at least 100 people.
- Cyclone Funso – Looped off the coast of Mozambique for days in 2012, causing severe flooding
- Cyclone Hellen – Underwent rapid intensification in the Mozambique Channel in 2014, but weakened significantly before striking Madagascar and Mozambique
- Cyclone Dineo – The last tropical cyclone to make landfall in Mozambique in 2017, killing over 200 people
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#### External links

<https://www.aljazeera.com/news/2019/03/cyclone-idai-death-toll-215-beira-city-90-percent-destroyed-190318101752250.html>



Beira city '90 percent destroyed' by Cyclone Idai, hundreds dead

Filipe Nyusi says more than 100,000 are at risk after storm hit Mozambique, Malawi and Zimbabwe.

11 hours ago

#### MORE ON WEATHER

- **Six US states reeling as rivers rise to record levels today**
- **Horn of Africa: Millions suffering due to prolonged drought today**
- **'Never seen so much rain': Zimbabweans struggle with storm floods yesterday**
- **Flash floods, mudslides kill at least 58 in Indonesia's Papua yesterday**

President Filipe Nyusi feared the death toll could rise to 1,000 in Mozambique in the wake of Cyclone Idai he said in a nationwide address on Monday.

"For the moment we have registered 84 deaths officially, but when we flew over the area ... this morning to understand what's going on, everything indicates that we could register more than 1,000 deaths," he said.

So far the total death toll has risen to at least 215 after the storm tore into central Mozambique last week before continuing on to Zimbabwe and Malawi, bringing flash floods and ferocious winds. At least 126 people were killed in Mozambique and Malawi, according to the Red Cross, and Zimbabwe's information ministry on Monday put the number of dead at 89 in the country. Hundreds are missing and more than 1.5 million people have been affected across the three countries by widespread destruction and flooding.

Most of the deaths in Mozambique happened in the central port city of Beira, 90 percent of which was destroyed, according to the International Federation of Red Cross and Red Crescent Societies (IFRC).

A large dam burst on Sunday in the city, cutting off the last road to the city of about 530,000 people, the IFRC said in a statement. "The scale of damage caused by Cyclone Idai that hit the Mozambican city of Beira is massive and horrifying," it said. The IFRC warned that the death toll could rise once the full scale of the devastation is known, with further heavy rains expected. The cyclone destroyed 90 percent of Beira, according to the Red Cross [Adrien Barbier/AFP]

"First came ferocious winds and torrential rain that lasted almost four days. It only eased up a short while ago," said Al Jazeera's Malcolm Webb, reporting from central Mozambique.

"The damage is extensive even 300km [from the cyclone's landing area] where we are. Hundreds of houses are destroyed in this district alone. People are sheltering in schools or with neighbours."

Euloge Ishimwe, the IFRC's Africa region communications manager, told Al Jazeera from Kenya's capital Nairobi that the shelters were immediate needs, but healthcare, clean water supply and sanitation also were high priorities.

"These are some of the things we are trying to provide. Mozambique Red Cross volunteers are already on the ground as well as the IFRC's international team," he said.

## Neighbouring Zimbabwe

In Zimbabwe, Idai tore across the eastern and southern parts of the country, a government official said on Monday, creating a humanitarian crisis in a nation grappling with economic woes and a drought.

Chimanimani district has been cut off from the rest of the country by torrential rains and winds of up to 170km an hour that swept away roads, homes and bridges and knocked out power and communication lines. Rescuers are struggling to reach people in Chimanimani, many of whom have been sleeping in the mountains since Friday after their homes were flattened by rock falls and mudslides or washed away by torrential rains. Many families cannot bury the dead due to the floods. The government has declared a state of disaster in areas affected by the storm, the worst to hit the country since Cyclone Eline devastated eastern and southern Zimbabwe in 2000. The country of 15 million people is already suffering a severe drought that has wilted crops. A United Nations humanitarian agency says 5.3 million people will require food aid.

### *Direct calls from the 14 shipping lines in the world*

#### Road Distances in Km

PORTS	Harare ZIMBABWE	Bulawayo ZIMBABWE	Lusaka ZAMBIA	Kitwe ZAMBIA	Lubumbashi DRC	Blantyre MALAWI	Lilongwe MALAWI
BEIRA	559	726	1,054	1,370	1,600	812	950
DURBAN	1,711	1,454	2,380	2,707	2,611	2,323	2,678
DAR ES SALAAM	2,634	3,028	1,985	1,951	2,290	2,031	1,667

One of the most modern multi-purpose and Container Terminals in the Southern Africa region. The Container Terminal covers 645 meters berth length, which comprise of berths numbers 2, 3, 4 and 5. The designed depth alongside of the quays is about 12 meters. The Terminal projected capacity is 400,000 TEUs per year.

### **CONTAINER STORAGE AND STACKING FACILITIES:**

- 350,000 m<sup>2</sup> well illuminated container yard, accommodate 11,200 TEUs/day including 144 electric reefer points and a dedicated IMDG dangerous goods storage area;
- Two bonded transit warehouses (8,400 m<sup>2</sup> and 3,650 m<sup>2</sup>) for stuffing and stripping containers, fully secured;
- Two ship-to-shore gantry cranes and one rail mounted gantry crane;
- Fully equipped with reach stackers, forklifts, terminal tractors, normal trailers & skeletons and emergency generator;
- Chrome, copper, cotton and tobacco can be containerized inside the port area;
- Weigh bridge for heavy trucks.

## **GENERAL CARGO-TERMINAL**

### **MULTI-PURPOSE GENERAL CARGO TERMINAL**

The General Cargo Terminal covers 670 meters berth length, which comprise of berths numbers 6, 7, 9 and 10. The designed depth alongside of the quays is 9.5 meters, and projected capacity is 10 million Tons per year.

The Terminal it is fully equipped with mobile harbour cranes, bagging units, grabs, payloaders for multiuse, shunting tractors, weighbridge for heavy trucks and can handle any form of cargo such as fertiliser, sugar, chrome, granite, wood, coal, pipes, etc.

### **GENERAL CARGO STORAGE FACILITIES:**

- Five covered warehouses-15,000 m<sup>2</sup>;
- 12,000 m<sup>2</sup> paved open space for ferrochrome, granite, steel and other break bulk cargoes;
- Rail siding facilities for all warehouses.

### **CURRENT PROJECTS**

## **NEW TERMINAL ENTRANCE**

In 1998 both general cargo and container terminal used one entrance and exit of the Port. Traffic growth has since forced CdM to invest in separate access gates. The current entrance of the container terminal was constructed in 2010 and has two lanes with a shared documentation office. The capacity limit of this entrance is 250,000 TEU per year and for this reason CdM started construction in 2016 of a new entrance complex with 5 dedicated access lanes for cargo trucks and 2 separate lanes for light traffic. The entrance complex is partially covered allowing physical inspection in all weather conditions and is prepared for the installation of OCR Portals for automatic recognition and registration of containers. The complex will have an annual capacity of 750,000 TEU and is scheduled to come into operation in December 2017.

Beira Grain Terminal was established in August 2010 and has earned a reputation for its business integrity and ability to help the receivers of these cereals to maximize their returns. Its success is based on the following key factors:

- A modern grain handling facility equipped with cleaning and bagging facilities to offer a variety of service options to our customers.
- An experienced, service oriented, aggressive and energetic team;

This terminal allows the unloading/loading of cereals in bulk with unloading/loading rates ranging from 4,000 to 6,000 tons/day, thereby reducing the costs of imports and increasing the capacity of the port.

Now the terminal has a total storage capacity of 50,000 MT.

The Coal Terminal (TCC8) at Beira port is located at berth 8. The terminal is used for the exports of coking coal, whilst thermal coal is currently being exported through the general cargo berths.

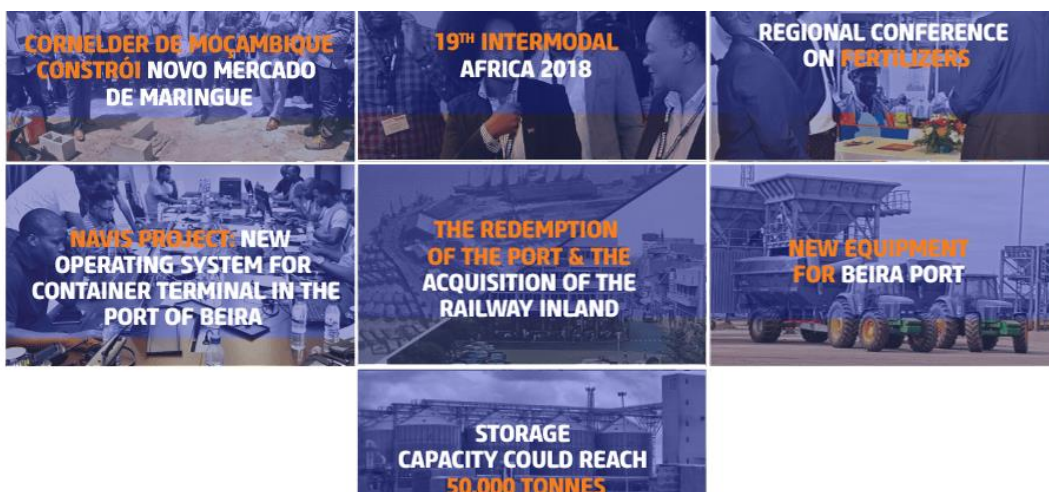


- Ship to Shore Gantry cranes available with 50 tons under hook lifting capacity each;
- Rail Mounted Gantry crane available with 50 tons for loading and offloading of wagons;
- Reachstackers - 45 tons;
- Kalmar Forklifts - 16 - 45 tons;
- Terminal tractors with 60 tons capacity and four wheel drive;
- Payloaders for multiuse;
- Shunting tractors;
- Mobile cranes - 35 and 45 tons;
- Normal trailers and skeletons;
- Bagging units (for grain and fertilizer);
- Grabs (for general cargo);
- Emergency generator - 1600 KVA;
- Weighbridges.

Port of Beira is recognized as one of the regional leading port in safety and security. Cutting-edge technology and progressive procedures are in place that provide high levels of protection and, at the same time, support compliance with port business policies.

The Terminals are fully secured with a hardened perimeter fence; a wide CCTV security camera system installed and has a Bio-Metric Access control, visitors and cargo, which is done by dedicated Security Company Specialized in Port Security. There is a multi-lane entrance complex to container terminal and a dedicated gate to general cargo terminal (in and out with electronic data access, customs, Immigration and health).

Partners in this comprehensive initiative include: Customs, Coast Guard, Department of Health and Environment, Fire Brigade Departments and others working to achieve a shared, united mission.



In the past two months CdM has received the first two of a total of four new bagging machines to modernize its existing fleet. CdM has also taken into operation two multi purpose Material Handlers from Terex Fuchs and two new weigh-bridges have been installed in addition to two existing weigh-bridges.

## Port Overview

The Port of Beira is the second largest port in Mozambique. It is located at the mouth of the Púngue River, 20 km from the open sea and about 1,200 km north of Maputo.

Served by extensive rail and road network systems, Beira is the main port for exports and imports from the Mozambique provinces of Sofala, Manica and Tete, and a strategic gateway for the landlocked countries in southeast Africa. It provides a short and quick access route for transit cargoes to/from Zimbabwe, Malawi, Zambia, Botswana and DRC. A fuel pipeline also links the port with Zimbabwe. The port of Beira has 11 berths stretching over a total length of 1,994m. This excludes berth Nr 1, which is reserved as a fishing harbour. 'Cornelder de Moçambique' (CdM), a joint venture between CFM (parastatal) and Cornelder Holding from the Netherlands, has operated it since 1998. Beira is a tidal port – pilotage and tug assistance is therefore compulsory at all times. Access to the port is via the Macuti Channel (17 nautical miles from the Macuti lighthouse). After a recent dredging operation, the width of the channel is now 250m, and depth is 8m on the straight sections and 9.20m on the Macuti bend. Systematic dredging is required to maintain the channel depths and width. The port of Beira is able to receive ships with a maximum tonnage of 60,000 tons, 24 hours a day. Vessels awaiting berth must anchor at the bar.



Port websites:

<http://www.cfm.co.mz/index.php/en/infraestruturas/cfm-center/port-of-beira>

<http://www.cornelder.co.mz/home/home.html>

Key port information may also be found at:

<http://ports.com/mozambique/port-of-beira/>

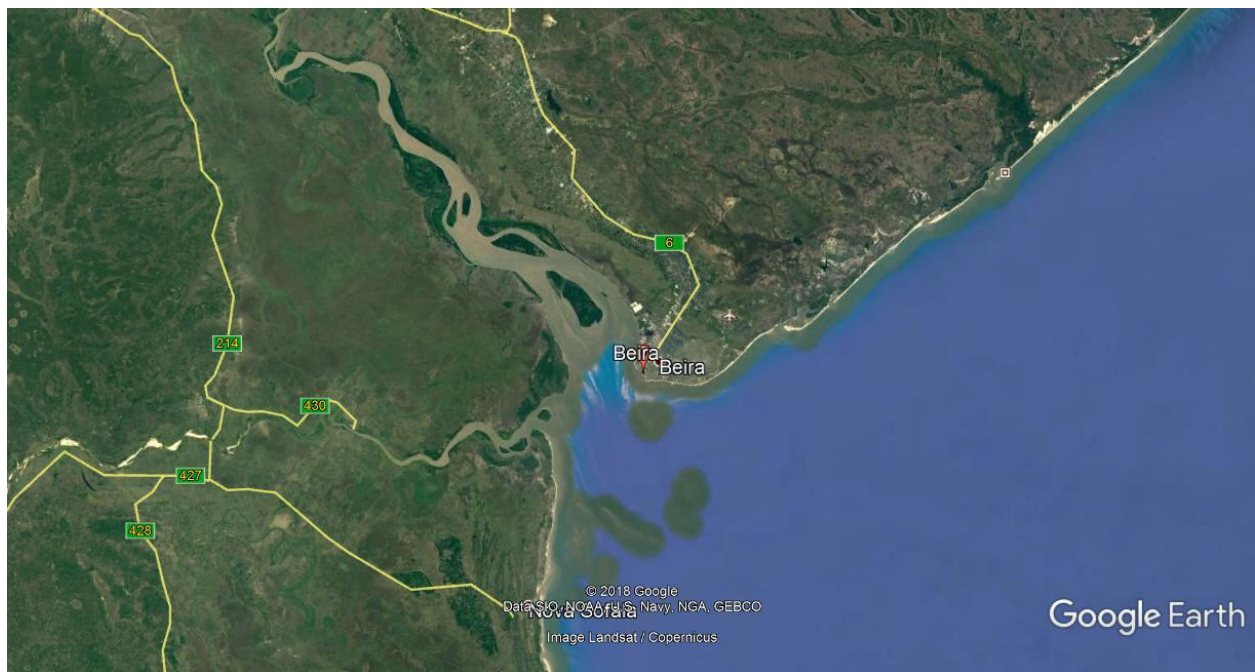
<http://www.maritime-database.com/port.php?pid=2271>

[https://www.searates.com/port/beira\\_mz.htm](https://www.searates.com/port/beira_mz.htm)

<http://www.findaport.com/port-of-beira>

Port Location and Contact	
<b>Country</b>	Mozambique
<b>Province or District</b>	Sofala
<b>Nearest Town or City with Distance from Port</b>	Beira Port in town
<b>Port's Complete Name</b>	Port of Beira
<b>Latitude</b>	-19.8461
<b>Longitude</b>	34.8576
<b>Managing Company or Port Authority</b>	Cornelder de Mozambique
<b>Management Contact Person</b>	
<b>Nearest Airport and Airlines with Frequent International Arrivals/Departures</b>	Beira International Airport LAM and SAA

Port Picture



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# Beira Port Terminals



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## Description and Contacts of Key Companies

Cornelder Mozambique manages the port.

For more information on port contacts, please see the following link: [4.3 Port and Waterways Companies Contact List](#)

## Port Performance

Beira is a tidal port – pilotage and tug assistance is therefore compulsory at all times. Access to the port is via the 17 nautical miles long Macuti Channel, with 250m width and 8m depth. The port of Beira is not congested. It is able to receive ships with a maximum tonnage of 60,000 tons, 24 hours a day. Berth occupancy in 2017 was 59% at the Container Terminal and 80% at General Cargo berths. Despite the increased tonnage handled, the Container Terminal is not congested. Container dwelling time is less than 10 days. With regard to bulk cargo (e.g. maize, wheat), productivity is around 150 mt/gang/hour, and bagged cargo averages 30 mt/gang/hour. Restricted road access to the port (roads are too narrow) and bureaucratic delays in the documentation process constitute the main constraints.

Priority for humanitarian cargo is easily negotiable.



Seasonal Constraints		
	Occurs	Time Frame
Rainy Season	Yes	From November to March
Major Import Campaigns	No	
Other Comments	There was a total of 35 days without navigation in 2017 due to declared bad weather.	
Handling Figures for 2017		
Vessel Calls	479 (486 in 2016)	
Container Traffic (TEUs)	218,876 (197,183 in 2016)	
Handling Figures Bulk and Break Bulk for 2017		
Bulk (mt)	5,010,961 (4,508,663 in 2016)	
Break bulk (mt)	215,498 (215,626 in 2016)	

## Discharge Rates and Terminal Handling Charges

For information on port rates and charges, please see the following links:

(OBS: Cornelder Tariff Book includes all tariffs except maritime services, which are included in the CFM Port Tariffs)

<http://www.cornelder.co.mz/tariffs/tariffs.html#>

## Berthing Specifications

Type of Berth	Quantity	Length (m)	Maximum Draft (m)	Comments
<b>Conventional Berth (6)</b>	1	170	10	General cargo
<b>Conventional Berth (7)</b>	1	165.5	10	General cargo
<b>Conventional Berth (8)</b>	1	187.9	10	Coal terminal berth
<b>Conventional Berth (9)</b>	1	167.3	10	General cargo/Silo berth

Type of Berth	Quantity	Length (m)	Maximum Draft (m)	Comments
Conventional Berth (10)	1	167.3	10	General cargo/Silo berth
Container Berths (2 to 5)	4	645	12	Container/General cargo
Silo Berth (9 and 10)	2	167.3	10	General cargo/Silo berth
Berthing Tugs	2			
Water Barges	n/a			

## General Cargo Handling Berths

Cargo Type	Berth Identification
Imports - Bagged Cargo	Nr 6 to 10
Exports - Bagged Cargo	Nr 6 to 10
Imports and Exports - RoRo	n/a
Other Imports	Nr 6 to 10

## Port Handling Equipment

Cornelder, a joint venture between CFM, Cornelder Holland and current concessionaires, manages the port equipment.

Equipment	Available	Total Quantity and Capacity Available	Comments on Current Condition and Actual Usage
Dockside Crane	No		
Container Gantries	Yes	2 x 50 tons 2 x 60 tons	STS Gantry cranes are fully operational.
Mobile Cranes	Yes	3 material handler	

Equipment	Available	Total Quantity and Capacity Available	Comments on Current Condition and Actual Usage
		1 mobile crane 28 tons	
<b>Reachstacker</b>	Yes	20 Sany	All operational
<b>RoRo Tugmaster (with Trailer)</b>	Yes	14 x 40 tons 16 x 60 tons	All operational
<b>Grain Elevator with Bagging Machines</b>	Yes	6 mobile bagging units, including hoppers 10 Bulk hoppers	
<b>Transtainer</b>	No		
<b>Forklifts</b>	Yes	5 x 3 tons 6 x 16 tons 2 x 30 tons 2 x 50 tons 3 x empty handler	
<b>Weighbridges</b>	Yes	1 x 18 mt 3 x 24 mt	

Over the year 2017, Gantry Crane availability was 93% (88% in 2016), Reach Stacker availability was 75% (73% in 2016) and Terminal Tractor availability was 92% (89% in 2016).

### Container Facilities

With the transition from COSMOS to NAVIS N4 terminal operating system late 2016, the control of the yard, the truck flow and vessel operations has improved and container traffic has increased. The average yard utilisation was 6,000 TEU and the truck turnaround time is less than one hour.

Facilities	20 ft	40 ft
<b>Container Facilities Available</b>	Railside Gantry 40 tons	
<b>Container Freight Station (CFS)</b>	No	

Facilities	20 ft	40 ft
<b>Refrigerated Container Stations</b>	144	
<b>Other Capacity Details</b>	Storage for 9,000 TEU Dwell time less than 10 days	
<b>Daily Take Off Capacity (Containers per Day)</b>	1,500 TEU	
<b>Number of Reefer Stations (Connection Points)</b>	144	
<b>Emergency Take-off Capacity</b>		
<b>Off take Capacity of Gang Shift (Containers per Shift)</b>		

## Customs Guidance

Customs regulations are, by their nature, complex and change regularly. This is also the case in Mozambique where SADC regional integration requirements combine with existing local procedures depending on the cargo being cleared. Principal legislation, contacts and other useful customs-related information are available from the Mozambican Customs Authority ([www.alfandegas.gov.mz](http://www.alfandegas.gov.mz))

The process of application for exemption of duties comprises the following steps:

- Accreditation and licensing to operate in Mozambique with special diplomatic status for duty free imports.
- Before the arrival of the cargo submission of the following is required:  
Commercial invoice  
Packing List  
Application to Customs with justification for exemption
- Customs clears the goods that can be exempted from duties, through the JUE (“Janela Única Eletrónica” or Electronic Single Window).
- For the submission to JUE, the following is required:  
Commercial invoice  
Transport document (original)  
Packing List  
Customs clearance document
- JUE issues a notice of payment (AP).
- Deduction of import duties at JUE.
- The AP is taken physically to the Tax Department to apply the respective deduction of the value of the import duties.
- Once this step is finalised, the customs clearance process can be completed.

For more information on customs in Mozambique, please see the following link: [1.3 Customs Information](#)

## Terminal Information

### MULTIPURPOSE TERMINAL

The container and multi-purpose terminal has a 645 m long quay with a 12 m depth alongside. The terminal has 9,000 TEU storage capacity and 144 electricity connection points for refrigerated containers. The container storage yard was recently expanded and covers now an area of 3 ha. The road access was also improved and has now five lines with an option for further extension. Currently the terminal uses the NAVIS N4 terminal operating system and can handle 300,000 TEU per year.

### GRAIN AND BULK HANDLING

CdM does not manage this terminal. It can handle 4,000 to 5,000 tonnes per day and has a silo storage capacity of 50,000 tonnes. Wheat and maize are the product most commonly handled annually by users of the terminal.

### MAIN STORAGE TERMINAL

Storage Type	Number of Storage Facilities	Area (m <sup>2</sup> )
<b>Bagged Cargo</b>	5 covered warehouses	15,000
<b>Refrigerated Cargo</b>		
<b>General Cargo</b>	Paved open air storage	150,000
<b>Bulk Silo Storage</b>	For cereals	50,000 tons

## Stevedoring

The following companies perform stevedoring activities in the port of Beira:

Chele Serviços e Consultoria – <http://www.csc.co.mz/>

BMP

Chigolo

Marperita – <http://www.marperita-mozambique.com/aboutus/>

Mozport Beira – <http://www.supermaritime.com/offices/beira/>

Naval Serviços à Navegação

## Hinterland Information

The port is served by two railway lines - one to Zimbabwe via Machipanda/Mutare (318 km to the border) operated by CFM, and another via D Ana to Malawi (357 km) and Moatize, Tete Province, (673 km) operated by CFM with a partial concession to ICVL and Jindal for the transport of coal from Moatize.

The road network serving the port is in reasonably good condition and enables the movement of trucks and international trade to/from Zimbabwe, Botswana (via Zimbabwe), Malawi and Zambia (via Zimbabwe, Malawi or directly via Tete Province). It also provides an easy route to access markets in Mozambique provinces of Sofala, Manica, Tete and Zambézia.

## Port Security

The port has a 6 km long electro-welded security fencing and a CCTV surveillance system, which complies with international security standards. Adequate safety procedures during cargo handling are in place.

Security	
ISPS Compliant	Yes
Current ISPS Level ( <i>Level 1 = Normal, Level 2 = Heightened, Level 3 = Exceptional</i> )	1
Police Boats	No
Fire Engines	Yes (3)

## BEIRA

### Contact address

Cornelder de Moçambique, s.a.  
Porto da Beira, PO Box 236, Largo dos CFM  
Beira, Mozambique

**Tel:** +258 - 2332 2734/5

**Fax:** +258 - 2332 2736

**e-mail:** [Cornelder@cornelder.co.mz](mailto:Cornelder@cornelder.co.mz)

Managing Director - Carlos Mesquita

Production Director - Orlando Belo

Finance & Admin Director - Jan Krogerus

Terminal Manager - Risto Aapro

Marketing & Sales Manager - Felix Machado

The port of Beira in Moçambique is situated at the mouth of the Pungue River at Longitude 34° 50' E and Latitude 19° 51' S. Time Zone is GMT+2 hours. The town of Beira is relatively modern, having been founded at the same time as Johannesburg (late 19th century), after having been identified as a potential port by the Portuguese explorer Paive de Andrade. This activity and rush to create a port and town occurred during the scramble between the Portuguese and British over the occupation of land in eastern southern Africa, with the British (in the form of Cecil John Rhodes' Chartered Company), having a strong interest in securing a sea link for the newly chartered lands of Rhodesia.

De Andrade's report was followed by a hydrographic survey of the river and bar and in 1887 a Portuguese military post was established, out of which the town grew. Beira, which is now Moçambique's second largest city, took its name from the Portuguese crown prince D Luis Filipe, who had been given the title Prince of Beira - the latter place being a region in central Portugal.

By 1889 channel buoys marked the entrance to the Pungue estuary and six years later work began on the first landing stage. A wooden pier was also constructed to serve the railway, which was then under construction.

The railway was built to a narrow gauge (two foot) and reached Umtali (now Mutare) on the Rhodesian border in 1898, but was soon converted to the more practical Cape Gauge of 3ft 6ins (1067mm). The railway quickly became the lifeline of the port and for many years carried much of the cargo and passengers to and from the landlocked Rhodesias (now Zimbabwe and Zambia) as well as Nyasaland (now Malawi). During the UDI days of Rhodesia much of this traffic was lost to Beira and the port and town suffered accordingly. The civil war in Moçambique also took its effect, particularly with the loss through sabotage of the railway leading to Malawi and the mineral-rich Tete Province

By the mid to late 1920s construction of deepwater berths and improved anchorage at Beira had begun under the control of the company named Companhia do Porto da Beira, which continued to administer the port until 1949 when the Moçambique Ports & Railways Company (CFM) took over administrative control. On 15 October 1998 a joint venture was formed between Cornelder Holding, based in Rotterdam (67%) and CFM (33%) for the management of the Beira Ports (Container and General Cargo Terminals) by Cornelder de Moçambique (CdM).

Cornelder de Moçambique is now a key partner in the economic development of the east southern African region and a principal catalyst in promoting this development. In its bid to spearhead economic development in the region CdM has engaged in a joint venture with a Zimbabwean Company located in Mutare (GMS Freight) where Dry Port facilities are being offered (inland container Terminal). The port remains directly linked to the hinterland (Zimbabwe and Zambia) by road and rail networks, and currently by road only to Malawi. However, the Sena railway line linking Beira with Malawi and the Tete Province is currently being rehabilitated. A pipeline constructed in 1960 links the port with Zimbabwe and Beira Port also has direct sea links to Europe, Asia and the world at large.

Beira port has a total of 11 berths stretching over a total length of 1994 meters, excluding berth number 1, which is reserved as a fishing harbor. Beira is 319km from the Zimbabwe border at Machipanda and 685km by good condition road from Malawi via Nova Wanduzi. The port handles a variety of cargo from breakbulk, neo bulk and bulk including petroleum products.



#### Beira Harbour limitations:

Access to the port is obtained via the dredged Mancuti Channel (17 n.miles from the Mancuti lighthouse). Ships waiting for berthing instructions are required to anchor east of the outer channel. The port is tidal with a MH spring range of 6.2 - 7.4m. Vessels awaiting berth must anchor at the bar. The approach to the River Pungue is obstructed by numerous banks and shoals, which are constantly changing. From the north end of Channel Rambler, the entrance channel is marked by light buoys west of Cbadelo light (metal mast, 4m in height), exhibits 9 cables north northwest of Ponta Gea on the edge of a bank fronting the shore between Ponta Gea and Ponta Chiveve. The port is open 24 hours a day although night navigation is restricted to vessels up to 7m draught and LOA of 140m. Pilotage and tug assistance is compulsory at all times, with pilots joining ships near P Buoy.

#### Tides

Vessels with a draught of 4.88m or less may enter the port at any state of the tide. Those drawing more than 4.88m are required to wait for a suitable height of tide before entry.

Tidal height at MHWS = 6.4m (21')

MHWN = 4.3m (14')

MLWN = 2.7m (9')

MLWS = 0.8m (2'6")

In the wet season with a high river, the ebb stream can attain a rate of up to 6 knots at springs and 2 - 3 knots at neaps.

#### Marine Craft:

Beira is served with two 2,200BHP, 35t bollard pull tugs, a pilot boat and a mooring launch, available 24 hours a day. One of the tugs is named Pungue. A private company performs dredging within the port and channel. The port employs five pilots.

#### Port Volumes:

During 2004 a total of 208 ocean-going ships called at Beira in addition to 80 coastal vessels. The container terminal handled 46,775 TEUs, which consisted of 240,333 tonnes landed (imported), 240,669 tonnes shipped (exported) and 48,456 tonnes of coastal traffic.

General cargo handled consisted of 345,729 tonnes of cargo landed, 486,032 tonnes shipped and 6,019 tonnes of coastal general cargo. Total port throughput in metric tonnes amounted to 1,367,238 tonnes.

#### Port Facilities:

The port of Beira's facilities include a container terminal and a general cargo terminal, both of which are concessioned to Cornelder de Moçambique. The port also has a liquid bulk facility

#### Cornelder de Moçambique Facilities

##### **Multi Purpose Container Terminal**

The multi-purpose and Container Terminal is one of the most modern in southern Africa and covers 645 metres of berth length, comprising of berth numbers 2, 3, 4 and 5 with a designed depth alongside of about 12 metres. The terminal design capacity is 100,000 TEU's per year.

##### **Container Storage and Stacking Facilities:**



- 200,000 m<sup>2</sup> well illuminated container yard; accommodating 3117 TEU'S including 144 electrical reefer points and dedicated IMDG dangerous goods storage area
- One bonded transit warehouse of 8400 m<sup>2</sup> for stuffing and stripping containers, fully secured
- 3650 m<sup>2</sup> covered storage area
- Dedicated granite storage area

### **General Cargo Terminal**

The General Cargo Terminal covers 670 metres berth length, comprising berth numbers 6, 7, 9 and 10. The terminal design capacity is 2,300,000 metric tonnes per year.

The designed depth alongside of the quays is 10 metres.

### **General Cargo Storage Facilities:**

- Five covered warehouses with a total of 15000 m<sup>2</sup>
- 12000 m<sup>2</sup> paved open space for ferro chrome, granite, steel and other break bulk cargoes
- Storage extension area for expansion is available with 175000 m<sup>2</sup>

All activities of CdM are fully computerized utilising a Port Management System (PMS). The system can be accessed by the client via internet to provide information on the status of their cargo.

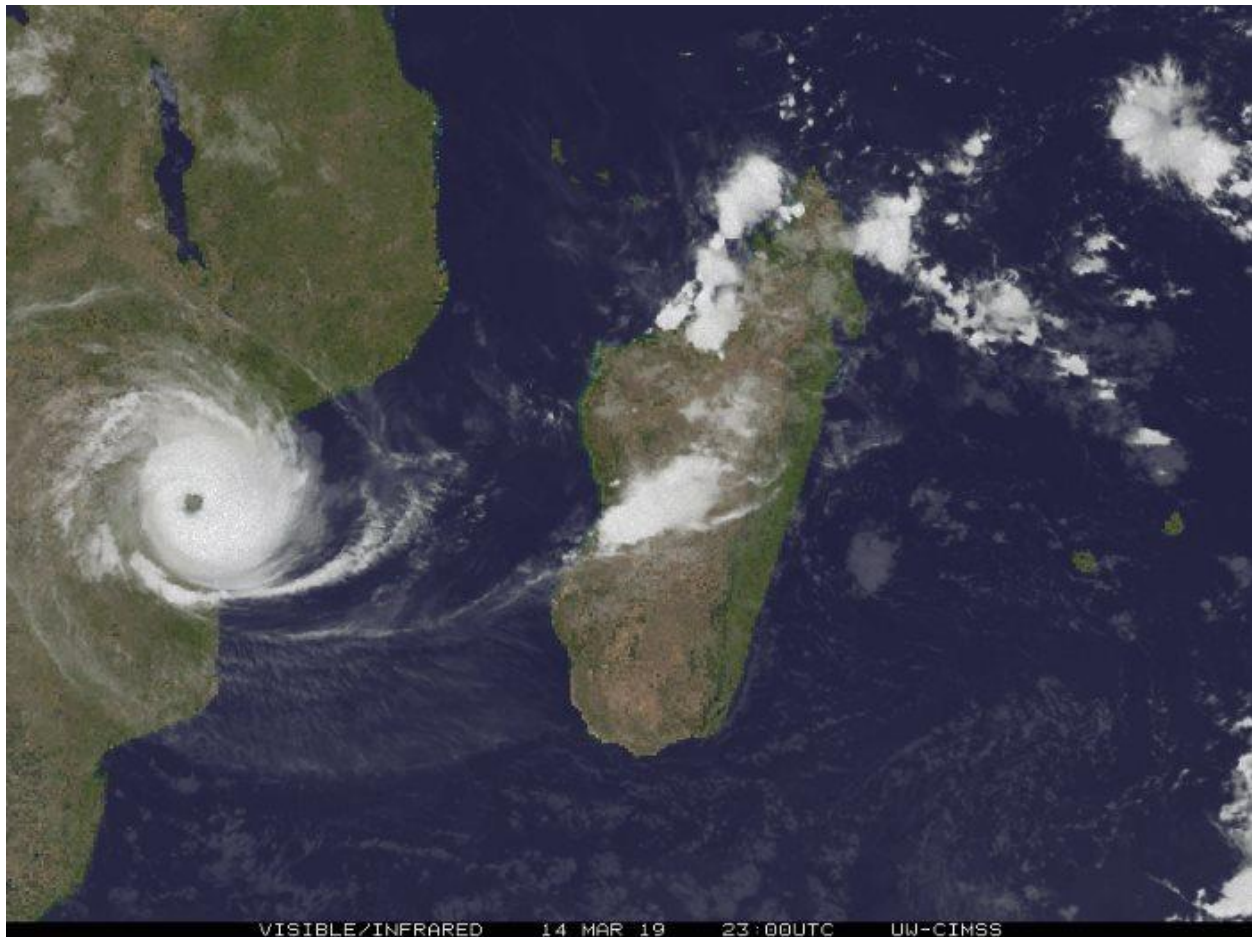
### **Port Cargo Handling Equipment**

- Two Ship to Shore Gantry cranes available each with 50 tons under hook lifting capacity
- One Rail Mounted Gantry crane available with 50 tons for loading and off loading of wagons
- Reachstackers - 45 tons
- Kalmar Forklifts - 16 - 45 tons
- Terminal tractors with 60 tons capacity and four wheel drive
- Payloaders for multiuse
- Shunting tractors
- Mobile cranes - 35 and 45 tons
- Normal trailers and skeletons
- Bagging units (for grain and fertiliser)
- Grabs (for general cargo)
- Emergency generator - 1600 KVA
- Weighbridge (28 meters long)

Berth 6 is for refrigerated cargo including citrus exports, vegetables and other fresh products. The coal terminal is on berth 8, and the oil terminal is at berths 11 and the new berth number 12 further upstream, where tankers of up to 60,000DWT and a 12m draught are catered for.

Beira has a small dry dock for vessels up to 110m LOA. The port has good ship chandling and stevedoring services. A ferry service operates to other small harbours along the coast including Buzi, Sofala, Chiloane, Machanga, Nova Mambone. Bunkering is available

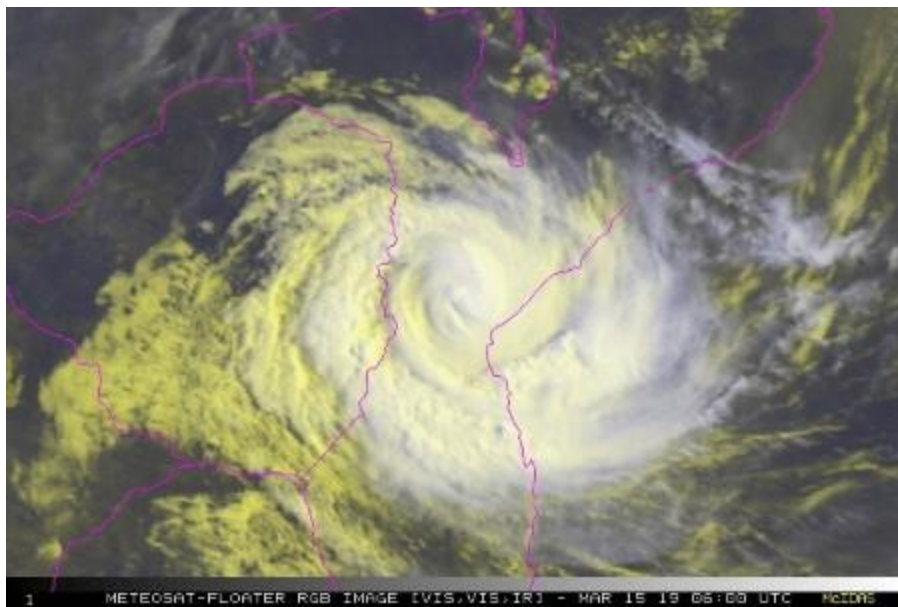
## **CYCLONE IDAI COMES ASHORE NEAR BEIRA, LOSSES OF LIFE REPORTED**



*Tropical Cyclone Idai moves over Beira heading inland. Picture Cyclocane*

Cyclone Idai TC18S has come ashore near the port of Beira as expected and is steadily moving away from the coast in the direction of the Zimbabwe border.

Heavy rain accompanied by strong 100-knots winds lashed the coast and adjacent inland areas, bringing flooding across the low-lying countryside and flash floods as rivers fill up and burst their banks. Reports of loss of life exceeding a hundred people across both Mozambique and Malawi have been received, although this was a result of the storm that heralded the development of the cyclone. The storm originated in central Africa and crossed Malawi and northern Mozambique before moving over the warm waters of the Mozambique Channel where it built strength until reaching cyclone strength – Cyclone Idai. The rains, which have brought floods sweeping flat terrain and flooding rivers, have affected 843,000 people across Southern Africa, according to local authorities and the UN. These reports prompted yesterday's calls for emergency aid. The effect of the cyclone coming ashore last night (Thursday) has still to be measured but is expected to be severe with loss of property and life.



*TC Idai moving inland, with rains already far across Zimbabwe.*

The Mozambique government issued a Red Alert ahead of the cyclone and has appealed for help and assistance. Several South African rescue organisations have responded and are already in Mozambique and are currently travelling by road towards the Beira region where their help and assistance will be required. Shipping appears to have given Beira a wide clearance but AIS records a number of local and foreign fishing vessels having taken shelter in the river port. Cyclone Idai, having come ashore, will, provided it continues to move inland, rapidly lose intensity below that of cyclone strength to that of a severe storm and reducing further, while still continuing to deposit large amounts of rain throughout, accompanied all the time by strong winds. With the countryside being low-lying a significant amount of casualties are now possible.

## ADVERTISEMENT

Media caption Drone footage shows the devastation caused by Cyclone Idai

The death toll in Mozambique from Cyclone Idai could be as high as 1,000, President Filipe Nyusi has said.

Mr Nyusi flew over some of the worst-hit areas on Monday. He described seeing bodies floating in the rivers. The storm made landfall near the port city of Beira on Thursday with winds of up to 177 km/h (106 mph), but aid teams only reached the city on Sunday. A UN aid worker told the BBC that every building in Beira - home to half a million people - had been damaged. Gerald Bourke, from the UN's World Food Programme, said: "No building is untouched. There is no power. There is no telecommunications. The streets are littered with fallen electricity lines. "The roofs on so many houses have fallen in, likewise the walls. A lot of people in the city have lost their homes."

School hit by deadly cyclone landslide

The official death toll in Mozambique stands at 84 following flooding and high winds. The cyclone has killed at least 180 people across southern Africa. The International Federation of Red Cross and Red Crescent Society (IFRC) described the damage as "massive and horrifying". People have had to be rescued from trees, Jamie LeSeur, the head of the IFRC assessment team, told the BBC.

Media caption People clambered on roofs and up trees in order to save themselves In Zimbabwe, at least 98 people have died and 217 people are missing in the east and south, the government said.

The death toll included two pupils from the St Charles Lwanga boarding school in the district of Chimanimani, who died after their dormitory was hit when rocks swept down a mountain.

People clambered on roofs and up trees in order to save themselves in Beira in Mozambique

Malawi was also badly hit. The flooding there, caused by the rains before the cyclone made landfall, led to at least 122 deaths, Reliefweb reports. The UK government said it would provide humanitarian aid worth £6m (\$8m) to Mozambique and Malawi. It also said it would send tents and thousands of shelter kits to Mozambique.

How bad is the damage in Beira?

Most of those known to have died so far were killed around Beira, the country's fourth largest city with a population of about 500,000, authorities there said. More than 1,500 people were injured by falling trees and debris from buildings including zinc roofing, officials in the capital Maputo told the BBC. "Almost everything has been affected by the calamity," Alberto Mondlane, the governor of Sofala province, which includes Beira, said on Sunday. "We have people currently suffering, some on top of trees and are badly in need of help." The port city of Beira bore the brunt of the cyclone. The Red Cross did an aerial assessment of Beira on Sunday. Local people in Beira have put in an "incredible effort" to reopen roads in the city, Mr LeSeur told the BBC's Newsday programme.

The road linking Beira to the rest of the country was damaged, but air links have now resumed. President Filipe Nyusi cut short a trip to eSwatini, formerly known as Swaziland, to visit the affected areas.

What's the situation in Zimbabwe?

A state of disaster has been declared in Zimbabwe. President Emmerson Mnangagwa has returned home early from a trip to the United Arab Emirates to "make sure he is involved directly with the national response", the authorities say. The ministry of information has shared pictures of pupils from St Charles Lwanga School, who have now been rescued. Shocked survivors at a hospital in Chimanimani district told

how the floods destroyed their homes and swept away their loved ones. "I still have not found where my daughter is buried in the debris," Jane Chitsuro told the AFP news agency. "There is no furniture, no more clothes, there is only rubble and stones." Praise Chipore's house was also destroyed. "My daughter who was with me in bed was washed away from me and a bigger flood carried me further away," she said.

Praise Chipore, 31, was recovering in hospital in Chimanimani 'Never seen anything like this'

Shingai Nyoka, BBC Africa, eastern Zimbabwe

My journey to Chimanimani ended abruptly when we came across a huge crater in the road. The river was raging below and scores of people were standing on either side. This was the main road linking the city of Mutare to the villages of Chimanimani, which have been cut off. Aid teams have been unable to get through. People who live in this area say they have never seen anything like this. An elderly couple, Edson and Miriam Sunguro, told me that they have been trying to contact relatives in Chimanimani without success.

What will the weather do next?

"There is a risk of more rain over the next few days for the northern half of Mozambique and southern Malawi," BBC Weather's Chris Fawkes says. There could be thunderstorms, he adds, but "the picture is complicated by thick layers of cloud left over from Idai that could prevent some thunderstorms from starting".

## **Mozambique, Zimbabwe - Tropical Cyclone IDAI and floods update (DG ECHO, WFP, INGC, Zimbabwe Red Cross, media) (ECHO Daily Flash of 17 March 2019)**

### **REPORT**

from [European Commission's Directorate-General for European Civil Protection and Humanitarian Aid Operations](#)

Published on 17 Mar 2019 — [View Original](#)

TC IDAI made landfall on 14 March in the district of Dondo, Sofala province in Mozambique. The port city of Beira has been severely damaged leaving the population isolated without electricity and communication. Access to the city of Beira is still hindered due to several road blocks and destroyed bridges. The airport infrastructure seems to be heavily affected too. Reports from the World Food Programme (WFP) indicate that the cyclone affected mostly the provinces of Sofala, Manica, Zambezia, Inhambane and Tete. The National Institute of Meteorology of Mozambique issued an alert for heavy rain and strong wind for the already affected provinces over the next hours. The National Institute for Disaster Management (INGC)

estimates 600 000 people in need of urgent assistance. The impact of TC IDAI and the floods over the last days are expected to further exacerbate the food security in the region due to massive destruction of livestock and planted crops just before the harvest season. The Zimbabwe Department of Civil Protection reports the districts of Chimanimani, Chipinge and Mutare as most affected. So far local authorities are reporting 23 deaths and at least 71 people missing. Several roads and bridges in the area are damaged or destroyed. Besides the national response, several NGOs have begun the distribution of non-food items and shelter to the affected and displaced people.

## **Over 1,000 feared dead after cyclone slams into Mozambique**

**By ANDREW MELDRUM Associated Press Mar 18, 2019 Updated 1 hr ago o**

JOHANNESBURG (AP) — More than 1,000 people were feared dead in Mozambique four days after a cyclone slammed into the country, submerging entire villages and leaving bodies floating in the floodwaters, the nation's president said. "It is a real disaster of great proportions," President Filipe Nyusi said.

Cyclone Idai could prove to be the deadliest storm in generations to hit the impoverished southeast African country of 30 million people. It struck Beira, an Indian Ocean port city of a half-million people, late Thursday and then moved inland to Zimbabwe and Malawi with strong winds and heavy rain. But it took days for the scope of the disaster to come into focus in Mozambique, which has a poor communication and transportation network and a corrupt and inefficient bureaucracy. Speaking on state Radio Mozambique, Nyusi said that while the official death toll stood at 84, "It appears that we can register more than 1,000 deaths." Emergency officials cautioned that while they expect the death toll to rise significantly, they have

no way of knowing if it will reach the president's estimate. More than 215 people were killed by the storm in the three countries, including more than 80 in Zimbabwe's eastern Chimanimani region and more than 50 in Malawi, according to official figures. Hundreds more were reported injured and missing, and nearly 1,000 homes were destroyed in eastern Zimbabwe alone. Doctors Without Borders said rivers have broken their banks leaving many houses fully submerged and around 11,000 households displaced in Nsanje, in southern Malawi. U.N. agencies and the Red Cross helped rush emergency food and medicine by helicopter to the stricken countries. Mount Chiluvo in central Mozambique was badly hit by flooding. One resident said he heard a loud noise, like an explosion, and suddenly saw a river of mud rolling toward his home.

"I was indoors with my children, but when we looked we saw mud coming down the road towards the houses and we fled," Francisco Carlitos told Lusa, the Portuguese News Agency. The family lost their home and possessions but safely reached higher ground. The country's president, who cut short a visit to neighboring Swaziland over the weekend because of the disaster, spoke after flying by helicopter over Beira and two rural provinces, where he reported widespread devastation. "The waters of the Pungue and Buzi rivers overflowed, making whole villages disappear and isolating communities, and bodies are floating," Nyusi said. The United Nation's humanitarian office said the government issued flood warnings and said heavy rains were forecast for the next 24 hours, including in areas already hit hard by Idai. The Red Cross said 90 percent of Beira was damaged or destroyed. The cyclone knocked out electricity, shut down the airport and cut off access to the city by road. U.N. officials cited reports that Beira Central Hospital's emergency room was flooded and without power, and that much of the building's roof had collapsed. Doctors Without Borders said it had completely ceased operations in Beira hospital, local health centers and throughout the community.

#### SITUATION OVERVIEW

Following Tropical Cyclone Idai's landfall, the city of Beira, in Sofala Province of central Mozambique lost communication. The full impact of the cyclone is yet to be established. However, initial reports indicate loss of life and significant damage to infrastructure in Beira and surrounding areas. At least 21 deaths and more than 70 injuries have been reported in Sofala Province, according to preliminary reports from State broadcaster Radio Moçambique. Meanwhile, the assessment team on the ground reports significant numbers of destroyed houses, missing roofs and fallen trees. WFP's warehouses were also damaged during the cyclone. The Beira airport has been temporarily closed. In Zambézia Province, the cyclone impacted Chinde District, where 1,192 people were affected and 84 houses flooded. In Manica Province, 127 houses, 36 classrooms and two health units were damaged or destroyed, and severe damage on crops has been reported. Five districts in Manica do not have electricity due to the downfall of 61 electricity poles. In Inhambane province, at least 39 houses were destroyed, 10 classrooms and one health unit affected in the districts of Govuro and Vilankulos.

The President of Mozambique, Filipe Nyusi, addressed the media on 15 March, informing that the Mozambican government is “doing all we can to ensure that the situation returns to normal” and welcoming the international solidarity shown in the aftermath of the cyclone. Prior to Cyclone Idai making landfall, the weather system had already affected at least 141,000 people, with 66 deaths recorded and 111 people injured, according to media reports quoting government officials. More than 17,100 people are estimated to be displaced in Zambezia and Tete, with 10 transit centres established in Zambezia and two in Tete. The strength of the storm has diminished as it has crossed land. However, it has continued to bring strong winds and heavy rains as it has made its way across central Mozambique and into eastern Zimbabwe. The Mozambican National Institute of Meteorology issued an alert on 16 March 2019 of heavy rains and strong winds in the provinces of Sofala, Manica, Tete, Inhambane and Gaza.

## RESPONSE

Ahead of Cyclone Idai’s landfall, the government established six on-site emergency operations and coordination teams, pre-positioned in six strategic locations (Vilankulos, Caia, Beira, Chimoio, Tete and Quelimane). The main coordination team moved by road from Caia to Beira on 15 March, led by the General Director of INGC and including members from the National Unit for Civil Protection (UNAPROC), focal points from the met-service, health, education, road and bridge authorities, river management authorities, energy sector, agriculture, shelter and water and sanitation sectors, as well as humanitarian partners. An inter-agency mission left from Maputo on 16 March to support the team on the ground. A self-sufficient IPSS medical team has also deployed from South Africa. A WFP Logistics Cluster team has arrived in-country to assess required common services support. WFP is bringing one more cargo helicopter (M8) to support response operations. Rapid assessments are underway in areas impacted by the storm, with further information expected in the coming period.




## IN BRIEF

## NEW ACCESS TO THE PORT OF BEIRA

**T**he port of Beira will soon have one more access. This measure will make it possible to reduce the waiting time for trucks that stop at this port, and will be accompanied by additional security actions and procedures. When the new port access built by Mozambique Ports and Railways company takes effect, the transporters will have just one stop inside the port: on entering the new screening terminal all the trucks will go through a process of checking and updating documentation, and when they leave they will have the necessary port authorisation for loading or unloading. Trucks whose situation is not regularised will have no access to the port. Port users and operators will soon be informed of the new

procedures, and their collaboration is crucial for the success of the operation, and the consequent improvement in port activity.

A further security measure implemented in the new access to the port will be the installation of surveillance cameras at the access gate and in the Container Terminal.

It is expected that the installation of these cameras will also contribute to improving the reliability of the information generated at the terminal and the confidence of port users, through reducing errors as well as reducing the time taken, and increasing the effectiveness of operations. 

**W**hat balance do you draw of the company's activity, considering the national, regional and international scenario and the sharp reduction in commodity prices on the international market?

**Adelino Mesquita (AM):** Beira, like any other port in the region, is suffering from the slowdown in economic activity. The major buyers of raw materials, such as China and India, have reduced their imports through force of circumstance. This has affected the projects that were already under way in Mozambique. In the Tete region, for example, there has been a sharp reduction in projects that were being implemented, and naturally this reduced the volume of cargo for the port (12 to 15%). Worsening this situation, we have the high exchange rate and the resulting shortage of foreign currency, a fact which has caused enormous constraints for Mozambican importers.

**The drought affecting the region, and the politico-military conflict in central Mozambique certainly also have an impact...**

**AM:** Yes, these two factors have a negative influence on the performance of the port. As is well known, this port not only serves the region but also the entire country with regard to importing inputs for agriculture. With the drought that is striking Southern Africa, the import of fertilisers has declined, and the export of agricultural surpluses has also fallen substantially. The second factor is indeed the politico-military conflict the country is going through. In the Beira corridor, unfortunately, the majority of cargo is transported by road, and not by rail, as happened in the past (except for coal, which comes from Moatize along the Sena line).

Cargo transported to and from Malawi, along National Highway No. 7 is being affected by the instability, which is felt mainly between Manica and Tete provinces. We have already had one client who told us that he was going to stop using this corridor ... Even so, we have had the good fortune, as a country and as a port, that most clients continue to believe in this corridor and this port as the most viable and efficient solution for their international trade. These clients are continuing to use the port of Beira, but it is necessary to solve rapidly the politico-military instability that is affecting the country. For several weeks, coal traffic along the Sena line was paralysed: this represented a reduction of more than half million tonnes in the handling of coal. So it is contributing to the reduction in traffic, but we hope that with the resumption of rail traffic along the Sena line, we can recover this traffic by the end of the year.

**Faced with this scenario which concerns us all, what is the message for the clients and operators of the port? And for the workers of Cornelder de Moçambique?**

**AM:** For our clients, the message is one of confidence, because we believe that very soon we shall once again enjoy stability. This is a very important factor. As for the state of the world economy, we think we are living through part of a cycle (the downswing), but that in a short space of time international trade will return to growth. At that time, we must all be prepared to respond to the demands of the market.

To our clients and to the various logistics operators, I also send a message of hope. Cornelder is not sitting back with its arms folded. We are continuing to invest in infrastructures, in equipment, in staff

and in the operational management systems, so that we can handle the cargoes of our clients with greater and better security. For our workers, the message is also one of confidence, for all that we have been doing. 2015 was a very good year. In 2016 we are facing some difficulties, for the reasons which I have explained, but we have to believe in our collective effort and seek to rationalise our costs. In this situation of a drop in traffic, we must be still more careful, so that we can keep the company fully functional, as well as the social benefits of the workers, until this crisis passes, for if we are not able to rationalise costs, we run the risks of not being able to meet some important conditions. We need everyone to collaborate so that we only incur costs when and where necessary. This is fundamental. The company remains committed to its growth, in the interests of the country, of the clients, of the shareholders, and also of all those who work here. Naturally, the larger our production, the better we will be able to improve the social benefits for our workers.

**Speaking of investments, can you tell us about the security measures under implementation?**

**AM:** Before speaking about these questions, I would like to introduce another investment we are undertaking, in expanding the storage area for containers. In terms of engineering, this is a large scale investment: we are building large embankments and expanding areas, an investment we began in 2014 and are continuing. Turning specifically to the security of the operational areas, we are right now at the phase of implementing the project for new fencing of Beira port - the area of Cornelder de Moçambique. The material was all made in South Africa, and should soon be installed. It consists of six

# NACALA CORRIDOR AND PORT PERFORMANCE ASSESSMENT

February 2018 Draft Final Report

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## INTRODUCTION

The objective of the *Nacala Corridor and Port Performance Assessment* is to report on transport, logistics, and production bottlenecks along the Nacala Corridor, and provide recommendations for improvement of the corridor that could lead to development of the region's economy. The study provides analysis of the Port of Nacala, the Nacala Special Exports Terminal (TEEN), railway and road networks, and nodes (inland terminals, weighbridges, etc.) and storage facilities, with an emphasis on transport and logistics services bottlenecks. The report also analyzes economic impacts of implementing selected transport improvements along the corridor. This analysis reports on increased cost savings, and investment leading to employment creation; and provides estimates on additional jobs and income created for the local populations thanks to transport improvements along the corridor. The report was done in close collaboration with the Ministry of Transport and Communications (MTC) and the Nacala Development Corridor (CDN) company.

## KEY FINDINGS

The Nacala Corridor covers the central and southern regions of Malawi and five provinces in northern Mozambique: Cabo Delgado, Nampula, Niassa, Tete, and Zambezia. The corridor is home to about 18 million people, according to various estimates, and agriculture employs 80–85 percent of the corridor's adult population. The corridor's area of influence extends with the rail line east from Nacala port on the Mozambique coast, westward through Nampula Province to Cuamba in Niassa Province, and on to Nkaya in Malawi and Moatize in Tete Province. Moatize in Tete Province is the location of a major coal mine that anchors the west end of the rail line.

**Agriculture can drive growth of corridor trade.** The agricultural sector dominates economic activity in both Mozambique and Malawi, with 24.8 percent of GDP for Mozambique, and 28.1 percent of GDP for Malawi in 2016.<sup>1</sup> Along the Nacala Corridor, the larger share of the labor force is employed in the agriculture/agribusiness sector. The majority of this population is smallholder farmers engaged in subsistence farming, although production of cash crops is also slowly taking off. Cassava, maize, beans, and horticultural products dominate smallholder production while cotton, cashew, sesame, macadamia, soya, tea, bananas, sugar, pigeon peas, groundnuts, and tobacco and forestry products are produced commercially. The top five exports from northern Mozambique are: sawnwood, cashewnut, sesame seed, pigeon pea and cotton; and from Malawi are: sugar, pigeon peas, groundnuts, tobacco and tea. The top five imports to northern Mozambique are: containerized imports, clinker, fuels, wheat and rice and to Malawi are: wheat, fertilizer, containerized imports, fuel, and clinker. Cotton, tea, plantation forestry (woodchips) and fertilizer have a high potential for production and volume growth.

***Mega-Projects have driven infrastructure improvements along the corridor.*** The most significant development has been the recently completed mega-project investment by the Vale-Mitsui Consortium comprising the construction of a coal mine at Moatize, a new section of railway and rehabilitation of the existing railroad, and a new coal terminal at Nacala-A-Velha, a distance of 912 kilometers, at a cost of US\$7 billion.

***Government and donors also realize the potential of the corridor and are committing resources.*** The governments of Malawi, Mozambique, and Zambia have committed investment, with support from the EU, AfDB, JICA, and Korea EXIM, for the Nacala Corridor Road Project, which will rehabilitate over 1,000 kilometres of road at a cost of approximately US\$758 million.

***Mozambique recognizes the importance of reducing policy-related obstacles along the corridor and is proactively tackling the problems.*** Mozambique is removing barriers to trade, including the repeal of the mandatory use of the Nacala Special Export Terminal (TEEN) for exports from Mozambique, effective from the July 31, 2017 and has also carefully structured concession agreements to ensure third-party access for general freight cargo. And through the commissioning of this report, Mozambique has demonstrated interest at identifying, addressing and measuring improvements along the corridor.

***Tackling policy-related obstacles is creating opportunities for greater investment along the corridor.*** These opportunities are concentrated in the downstream gas, coal, forestry, tourism, and agro-processing sectors along the Nacala Corridor. However, most of these projects are realizable only in the medium-to long-term. The focus in the short-term is to identify interventions that can accelerate economic development by lowering transport and logistics costs, which can be achieved by leveraging improvements in transport infrastructure and supporting ongoing efforts to enhance trade and transport facilitation as well as reforms to improve the business environments.

already seen a significant reduction of transport costs along the corridor. A recent study by JICA has shown that the cost of transporting cargo from the port of Nacala to Blantyre in Malawi is 78% less expensive than bringing cargo to/from Beira, 40% less expensive than to/from Dar es Salaam and 39% less expensive than to/from Durban. This clearly illustrates that the Nacala Corridor railway is the most cost-effective option for Malawi based shippers.

1. ***High costs, lengthy time and low reliability*** for facilities and transactions across the corridor hinder competitive advances along the corridor. A considerable portion of infrastructure and transport facilities along the corridor are in poor condition or require further upgrades, including the port, road and rail infrastructure, including weighbridges and loading/offloading equipment, as well investments to securely transport goods.
2. ***Regulatory issues also limit smooth movement of goods across the corridor.*** These include transport regulations, such as mandatory use of the export terminal TEEN, which was in effect until July 2017 and checkpoint regulations; customs regulations (ContraMarka system, import/export procedures at border posts); and lack of storage facilities at/near the Nacala port, as well as near production centers across the corridor. Another issue is that sensible regulations are not adequately enforced, such as weight restrictions on roads, which impacts the competitive dynamics between road and rail, as well as transport quality.
3. ***Road-related transport costs in Mozambique can be six times higher than in Malawi and should be addressed.*** Road node costs are significant. For example, when traveling from Beira to Blantyre, road users will pay \$132 in road user fees in Malawi and an estimated \$370 in road user and weighbridge fees in Mozambique. Traveling the Nacala corridor to Blantyre road user fees are estimated at \$64 in Malawi and over \$400 in Mozambique. Traveling from Nacala to Lichinga, road users noted informal checkpoint fees and charges including 1,500–2,000 MT at a non-functional weighbridge on the Cuamba-Lichinga road, 2,500 MT at the weighbridge near Nacala, and 2000–3000 MT for bribes at various checkpoints along the corridor.
4. ***While rail is less expensive than road, transit times due to slow wagon speed and delays in loading and unloading make rail uncompetitive.*** Cargo traveling from the Nacala port to and from Blantyre, Lilongwe, Chipata, Cuamba, and Lichinga also has the option of using rail transport, which is typically the cheapest mode of transport. However transit times are longer due to wagon speed on the branch lines and loading/unloading time at the nodes. Loading/unloading a 42-wagon train typically takes between three and four



**Cost savings to the private sector through increased volume and lower transport costs have been estimated at US\$ 28 million by 2020.** Though cargo traffic along the corridor is expected to rise significantly over the short-term, addressing bottlenecks can help cargo traffic grow faster. The results from the traffic forecast model show that growth in overall cargo will rise from 1.92 million tons in 2015 to 3.45 million tons in 2020. This potential shift is expected to coincide with the new and proposed new improvements in the rail and port system enhance efficiencies on the corridor.

- Road-based traffic is expected to increase marginally from 1.78 million tons in 2015 to 2.17 million tons in 2020.
- Rail-based traffic is expected to increase from 0.14 million tons in 2015 to 1.37 million tons by 2020.

**The potential economic impacts for Mozambique are large: \$28 million on costs savings and 30,000 new jobs.** In 2020, by shifting 535,000 tons of exports onto the Nacala Corridor railway system and removing the direct and indirect costs associated with the compulsory use of TEEN, it is estimated that US\$28 million in costs savings can be achieved. If these savings are directed into investment, an additional 116,000 tons of export product will be generated, creating a further 30,000 jobs, either as employment or livelihood opportunities, and an additional US\$17 million in income, at an average per worker/smallholder producer of US\$580 per year. Malawi may also benefit by 2020, receiving US\$4.2 million in cost savings and the creation of 12,390 jobs.<sup>2</sup>

#### TRANSPORT AND LOGISTICS:

- Costs and delays due to the operation of TEEN for Mozambican exports;
- Costs, delays and time variability issues due to Nampula check points and the broken weighbridge near Cuamba;
- Delays and time variability at road border posts (Beira and Nacala corridors);
- High road node costs;
- Costs, delays and time variability at Cuamba, Lilongwe and Chipata rail intermodal facilities;
- High cost and time of road transport to Niassa;
- Nkaya rail node time variability due to loco availability;
- Port Scanning costs (both Nacala and Beira);
- Nacala Port customs time variability;
- Nacala port high berth container handling times; and,
- Nacala port high time variability.

#### RAIL BOTTLENECKS

- Low volume of cargo carried through railway, therefore low demand for railway services;
- Return freights go empty, due to low volume of production and exports in the region, which keep railway costs high;
- Train lengths are short;
- Railway needs better equipment and facilities, particularly for loading/offloading; and,
- Rail sidings are not of sufficient size.

Table 5 shows that the Beira port continues to handle more transit imports and exports for Malawi than the Nacala port. The fact that the market share of Nacala has remained constant suggests that users are relatively stable and that new customers need to be attracted to the corridor.

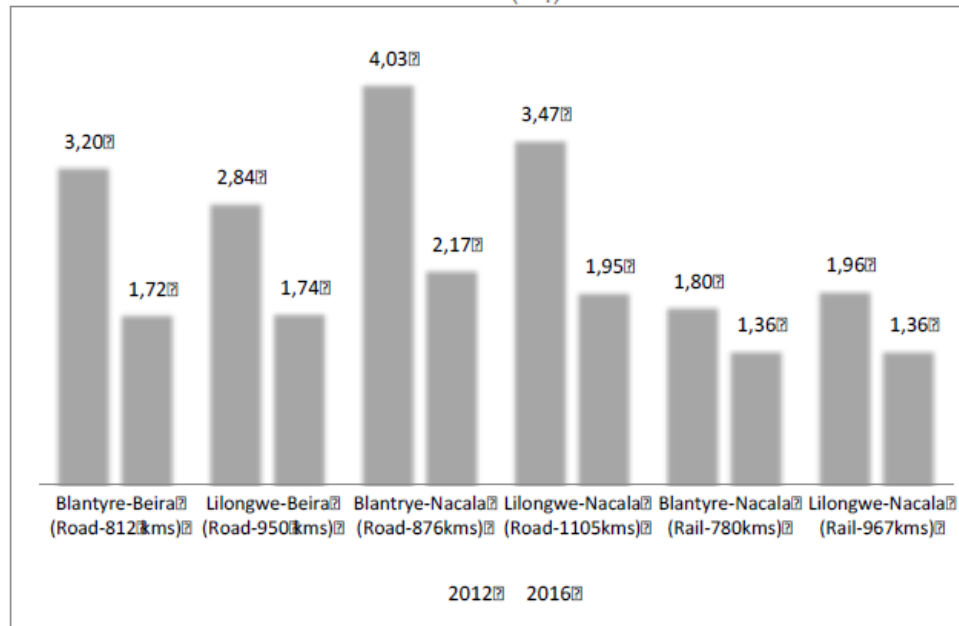
TABLE 5: NACALA VS. BEIRA PORT - MALAWI TRANSIT CARGO, 2013–2015 (000'S TONS)					
Beira Corridor			Nacala Corridor		
2013	2014	2015	2013	2014	2015
538	397	581	291	251	231
Market Share of Total Malawi Trade by Volume (%)					
15.5	14.4	22	8.4	9.1	8.8

Source: Comelder Mozambique – Official Port Statistics and Portos do Norte – Official Port Statistics (2013-15)

rail transport for both national (Mozambique) and transit (Malawi) cargoes for the years 2010 and 2016. The key conclusions to be drawn from the figure are as follows.

- Imports have expanded much more rapidly than exports. From 2010 to 2016 there was an increase of 477,000 tons in imports, compared with only 59,000 in exports. When broken down further national (Mozambique) imports grew by 472,000 tons and transit (Malawi) imports by only 5,000 tons and national (Mozambique) exports grew by 52,000 tons and transit (Malawi) exports by 7,000 tons. This suggests that national (Mozambique) imports, which have contributed 88% of all additional port volumes, have been the driving force behind growth over this period.
- National (Mozambique) cargoes have expanded much more rapidly than transit (Malawi) cargoes. From 2010 to 2016 there was an increase of 510,000 tons in national cargoes compared to just 12,000 tons for transit cargoes. This suggests that transit cargoes through the Nacala port have stagnated over this period.
- Road transport is by far the most dominant mode of transport on the corridor, accounting for 76% of cargo in 2012 and 86% in 2016. However, for national cargo road transport accounted for 92% of cargo in 2010 and 99% in 2016. These flows are dominated by movement between the port of Nacala and the provincial capital of Nampula. By contrast, transit cargo on rail transport accounted for 86% of cargo in 2010 and 93% in 2016. This suggests that rail cargoes are best suited for long-haul inland national and transit cargoes but flows beyond Nampula are still low. Moreover, road transporters to/from Malawi prefer the Beira Corridor because it is closer and cheaper.

FIGURE 5: TRANSPORT COSTS PER-TEU KILOMETERS (US\$) 2012 AND 2016



### 3.1.1. REGIONAL CORRIDOR OVERVIEW

Northern Mozambique, Central/Southern Malawi, and Eastern Zambia are served by four main trade and transport corridors for regional and international trade: the Nacala corridor, the Beira corridor, the North-South corridor, and the Dar es Salaam corridor. Nacala and Beira both have captive traffic zones and compete for traffic where their catchment areas overlap (figure 12). The Niassa, Nampula, and (Upper Zambezia) provinces in Mozambique effectively serve as captive markets for the Nacala Corridor for both imports and exports. Malawi's regional and international trade is served by several transport corridors, with Beira being the most important competitor for international trade. The North-South road corridor is the most important route for regional trade, dominated by imports from South Africa. This promotes the diversion of Malawi's international exports through the South African port of Durban, despite the longer land transport distance, and most often higher costs. It is not always the shortest and lowest cost route which is chosen by customers.

This study focuses on the geographic region in Mozambique and Malawi served by the port of Nacala. Beira port and corridor are also discussed, but discussion is limited to the corridor's role as a competitor to the Nacala Corridor. The Nacala Corridor covers the central and southern regions of Malawi and five provinces in northern Mozambique: Cabo Delgado, Nampula, Niassa, Tete, and Zambezia. The corridor is home to about 18 million people, according to various estimates, and agriculture employs 80–85% of the corridor's adult population.<sup>18</sup> The corridor's area of influence extends with the rail line east from Nacala port on the Mozambique coast, westward through Nampula Province to Cuamba in Niassa Province, and on to Nkaya in Malawi and Moatize in Tete Province (the location of a major coal mine that anchors the west end of the rail line).



### 3.1.3. BEIRA CORRIDOR

#### Beira Port

As noted above, the Beira road corridor is the Nacala corridor's main competitor for traffic to and from Malawi. The prime catchment area for Beira is central Mozambique, Zimbabwe, Zambia, the copper belt, and southern Malawi. Beira port has traditionally served as the prime port for Malawi's international trade, up to 1985 via the Sena railway to Limbe, and after 1985 by road through Tete. The railway has not been operational since 1985, and it is unlikely that the railway will be reinstated in the foreseeable future due to the projected high rehabilitation costs.

Beira port is several times larger than Nacala with respect to area, number of berths, shipping calls, and freight volume (table 7). However, the port suffers from limited depth and a long 40 km access channel that requires constant maintenance dredging. As a result, operating costs and risks are high. The port is privately managed through a concession with Cornelder. The table below has more information on Beira port. The general cargo berths in Beira are currently suffering from berthing delays of up to 30 days for fertilizer imports (peak season). There are no delays on the container berths.

As noted above, Vale chose to move its coal via the Nacala corridor, despite the existing coal terminal in Beira. During the Nacala corridor construction period, coal was transported from Moatize to Beira, but the draft limitations at Beira, particularly in the 40 km long access channel, required Vale to use smaller vessels for loading and to then transship to larger vessels offshore, resulting in additional costs and risks. Vale ceased using the Beira coal terminal and the Sena railway for their coal exports in September 2017.

FIGURE 8: BEIRA PORT LAYOUT 2017



TABLE 7: BEIRA PORT DESCRIPTION

Component	Description
Area	The total area of the existing Beira port and the land available for future development of more than 500ha. Beira serves Zimbabwe, Zambia, Malawi and the DRC, and has a throughput of 3 to 4 times more than Nacala – including the coal export berth
Berths	4 container berths and 4 general cargo berths, including a grain terminal. in addition, a coal terminal and an oil terminal
Depths	Vary from 10 m for the general cargo berths to 12 m for the containers and oil berths
Marine access	Difficult, via a 40 km long channel, 8m below CD, entry for large vessels only on the tide. Requires continuous maintenance dredging
Road access	Generally good from Malawi through Mwanza to Blantyre and through Dedza to Lilongwe. Between Beira and Dondo, approximately 30km, often poor and prone to flooding
Rail access	No rail access to Malawi, except via Moatize – not viable for general freight. The Sena line connection to Malawi has been closed since 1985, and seems unlikely to reopen
Storage	The port area is not constrained
Constraints	The marine access and depth of the general cargo berths
Planned developments	Proposal to extend the general cargo quay by 600m to provide additional 2 large berths. Planned new major coal terminal is on hold

Source: Nathan (2017) with information from Cornelder

### Beira Rail

There is presently no direct operational rail link between Beira and Malawi, except via Moatize. A trial shipment of clinker imports for Malawi was sent by rail to Moatize, for transshipment to road to Blantyre, but this was considered to be not viable due to the storage difficulties and high costs. The existing link between Mutarare and Limbe has been non-operational since 1985, and the section linking to Bangula (sugar exports) was flood damaged in the late 1990s.

### Beira Road

The road link between Beira and Malawi carries more than one mtpa of freight, mostly in the import direction for Malawi. Sections of the roads have been very poor in the past but have recently been upgraded. The roads (below) in Malawi are generally in good condition.

Source road transport costs are typically quoted by trucking companies as “all in” prices from the origin to destination. For purposes of the FastPath2 analysis, we split these road costs into cost per link (i.e. trucking costs) and node (road user fees, checkpoint fees, and weighbridge fees) when possible to see where costs were high. As shown in figure 15 above, the road costs constitute the majority of the transport costs. However, road node costs are also significant. For example, when traveling from Beira to Blantyre, road users will pay \$132 in road user fees in Malawi and an estimated \$370 in road user and weighbridge fees in Mozambique. Traveling the Nacala corridor to Blantyre road user fees are estimated at \$64 in Malawi and over \$400 in Mozambique. Traveling

During a visit to Beira in November 2017, it was noted that Beira port has berthing delays of up to 30 days for fertilizer imports for Zimbabwe and Zambia. Nacala has no berthing delays, and bulk unloading is faster than Beira, but Nacala would not be able to handle the same volumes as Beira. Shipping agents such as LBH and shipping companies such as MSC and CMA-CGM report that there are very few delays at Nacala except for the slow container handling rates because of the absence of STS cranes, which will be rectified in the planned JICA upgrade. The delays caused by the need for a contra marker prior to ship handling can perhaps be overcome by the port accepting an electronic submission one day before the vessel berths.

The Nacala port is not congested at present, but the port area is very limited in terms of total area (about 25 ha) and also the landside width of the port (250 m). There is very limited storage space within the port. For this reason, according to the Nacala Port tariff book, there is no free storage time provided for containers. Beira offers between five and 15 days of free storage for import containers, as it does not have the same space constraint.

The capacity of the present container terminal is set at 180,000 TEUs per year, and the fully equipped new two-berth terminal on the north quay is planned at 250,000 TEUs per year. A modern container berth, fully equipped with gantry cranes and a width of 500 m, should have a capacity of about 250,000 TEUs per year (per berth), such as the new container terminal at Mombasa and the new modern terminal at Coega/Ngqura. For all the African east coast ports, the efficiency, costs, and capacity of the port is largely determined and influenced by how quickly the imports, both containers and bulk, can be moved away from the quayside and out of the port. At present, this works quite well at Nacala because both bulk and containers are moved away from the quayside fairly quickly. As

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As noted above, the rail link to Beira is currently not operational, and all traffic is by road. The roads are generally in good condition, but the route is heavily travelled. Based on the data collected, road costs to Beira were similar to or more competitive than those to Nacala, but more expensive than transport by rail. Transporters indicated that the road route to Beira had more issues at the border posts than Nacala, in particular at Mwanza-Zobue where delays ranged between one and three days. The border post has issues with electricity, as did the Milange border post on the Nacala corridor. Further, the area also has had recent security concerns and theft issues. The Beira Corridor costs are captured in table 10.

TABLE 10: FASTPATH2 BEIRA CORRIDOR TIME AND COST SUMMARY

Corridor	Type	Imports			Exports [c]		
		Price US\$	Price US\$/t [b]	Time hours	Price US\$	Price US\$/t [b]	Time hours
Beira-Blantyre Road	Road Link [a]	1,519	66.04	17	1,503	65.35	17
	Border Post Node	79	3.43	24	95	4.13	24
	Road Node-Malawi	132	5.74	0	132	5.74	0
	Road Node-Mozambique [d]	370	16.09	12	370	16.09	12
	Seaport Node	530	23.03	133	530	23.03	133
	Total	2,630	114.33	186	2,630	114.33	186
Beira-Lilongwe Road	Road Link	1,738	75.57	21	1,697	73.78	21
	Border Post Node	54	2.35	24	95	4.13	24
	Road Node-Malawi	238	10.35	0	238	10.35	0
	Road Node-Mozambique [d]	370	16.09	12	370	16.09	12
	Seaport Node	530	23.03	133	530	23.03	133
	Total	2,930	127.38	190	2,930	127.38	190
Beira-Chipata Road	Road Link	2,210	96.07	20	2,194	95.37	20
	Border Post Node	62	2.71	24	79	3.41	24
	Road Node [d]	258	11.22	12	258	11.22	12
	Seaport Node	530	23.03	133	530	23.03	133
	Total	3,060	133.03	189	3,060	133.03	189
Beira-Lichinga Road	Road Link	3,000	130.43	25	3,000	130.43	25
	Border Post Node	0	0.00	0	0	0.00	0
	Road Node [d]	46	2.00	12	46	2.00	12
	Seaport Node	530	23.03	133	530	23.03	133
	Total	3,576	155.47	170	3,576	155.47	170

Source: Nathan FastPath2 estimates based on information from Portos de Norte, CDN-CEAR and interviews (2017)

TABLE 11: FASTPATH2 BEIRA PORT TIME AND COST SUMMARY

Component	Price US\$	Time	Time Variability	Reliability %	Logistics Score
Berth	78.0	18	66.67	52	56.67
Channel	0.7	12	75.00	48	88.89
Consolidation	0.0	0	0.00	0	0.00
Customs	225.0	30	80.00	46	73.89
Gate	21.0	1	125.00	30	67.78
Intermodal Transfer	N/A	N/A	N/A	N/A	N/A
Yard	205.0	72	50.00	62	38.33
Total	529.7	133			

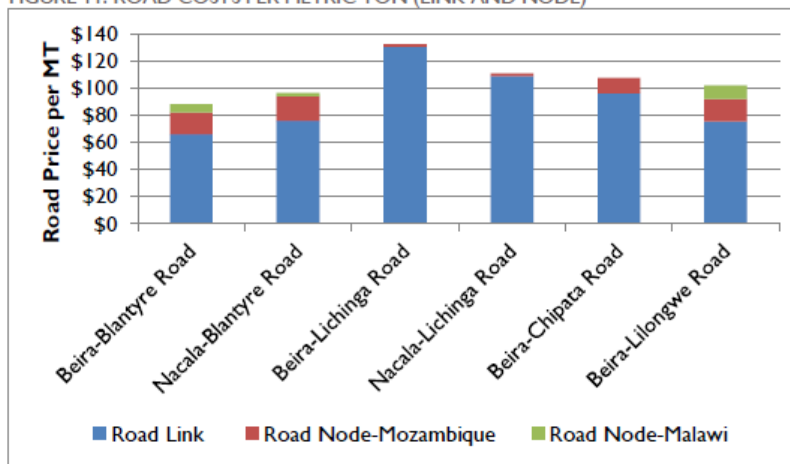
Source: Nathan Associates FastPath2 calculations (2017)

2018, as well as concerns over delays in the construction. Shipping lines noted that operational efficiency is much better at Beira, where there is automated equipment (gantry cranes) and they do not have to use ship's gears for offloading. This means that offloading is much faster: 45 to 60 moves/hour compared to between 12 and 18 depending on the number of ships' gears in Nacala.

#### ***Nacala/Beira-Lilongwe and Nacala/Beira-Chipata***

The Nacala railway also is less expensive than road transport to Lilongwe and Chipata. However, time and reliability are factors due to the quality of the rail in Malawi after leaving the mainline. After CDN-CEAR's rehabilitation of the Malawi spur line, rail should be the obvious choice for some commodities. Rail cost savings typically increase with distance, as can be seen by the lowest unit prices overall being for rail to Chipata.

FIGURE 11: ROAD COSTS PER METRIC TON (LINK AND NODE)



Source: Nathan estimates from FastPath2 (2017)

On both corridors, road user fees were found to be high. For example, traveling from Beira to Blantyre, road user fees/tolls were estimated to be US\$132 in Malawi and US\$350 in Mozambique, plus a US\$20 fee at Tete weighbridge. From Blantyre to Nacala, these fees were estimated to be US\$64 in Malawi and US\$403 in Mozambique.



All border posts were cited as having delays due to electricity outages. This was particularly a problem for the Mwanza/Zobue border post, which sees more traffic than Milange. Road user fees for Mozambique trucks are charged according to the specified route by the purchase of vouchers, which are often unavailable due to lack of electricity. If the return route is changed, then the truck driver needs to buy additional vouchers before he can drive, which often causes delays.

While rail transport costs may perform well, transit times do not. Transit times from Cuamba-Lichinga are long, as priority is given to passenger trains that make frequent stops. As volumes on this spur line increase, performance will have to increase as well. Rail transit times in Malawi and Zambia are poor due to poor track condition off of the mainline. Investments are currently being made that should mitigate this constraint. Rail transit times in general are poor due to offloading/loading times, as further discussed in section 6.6 later in this report.

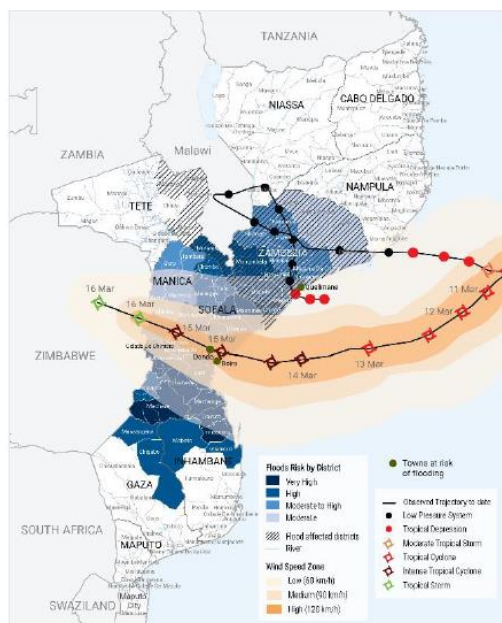
Bottlenecks at Nacala port mainly refer to poor offloading/loading times due to reliance on ship's gears. This should be mitigated by the JICA project, which will purchase two gantry cranes. Additionally, there are occasional waits for a berth as space is currently limited during the

## HIGHLIGHTS

- Initial reports indicate significant damage to Beira and surrounding areas, including destroyed houses.
- Sofala, Manica, Zambezia and Inhambane provinces have been hardest hit by the cyclone's path and the preceding tropical depression.
- An inter-agency assessment team, led by the National Institute of Disaster Management's (INGC) Director, is on ground in Beira.

## SITUATION OVERVIEW

Following Tropical Cyclone Idai's landfall, the city of Beira, in Sofala Province of central Mozambique lost communication. The full impact of the cyclone is yet to be established. However, initial reports indicate loss of life and significant damage to infrastructure in Beira and surrounding areas. At least 21 deaths and more than 70 injuries have been reported in Sofala Province, according to preliminary reports from State broadcaster Radio Moçambique. Meanwhile, the assessment team on the ground reports significant numbers of destroyed houses, missing roofs and fallen trees. WFP's warehouses were also damaged during the cyclone. The Beira airport has been temporarily closed.



mostly directed to Europe (26.4%) and South Africa (22.7%).<sup>i</sup> Despite the ongoing economic crisis in Europe, exports are projected to increase by a further 14.4% to US\$ 3.6 billion in 2013. Natural gas could emerge as Mozambique's main export product in the medium term, with the first two five-million-tonnes-per-annum liquefied natural gas (LNG) liquefaction trains to be commissioned by 2018.

Mozambique is responsible for 70% of goods transit in the Southern African Development Community (SADC), with logistics corridors linking the deepwater coastal ports with the neighbouring countries.

Intra-regional trade is expected to gain further importance after a consolidation of SADC free trade tariffs, which were initiated in 2008. Bilateral agreements with Malawi and Zimbabwe have already been

connects the Nacala Development Corridor and links to the Central East African Railway (CEAR) of Malawi.

**Beira railroad** (CFM Centro) is the oldest railway system in Mozambique. It connects the city of Beira with Harare in Zimbabwe, and also connects Beira to the coalfields of Moatize. It also has the potential to link to the railway of Malawi as well as to Zambia via the Sena line.

The third corridor, **Maputo railroad** (CFM Sul), links Maputo to the northeastern part of South Africa. It also connects with Zimbabwe and Swaziland through railway branches.

The railway system is functional and has been attracting private interest in recent years. The main challenges in the rail sector are meeting the increasing demand due

Real GDP growth averaged around 7.3% between 2010 and 2012 and is projected to be around 8% annually between 2012 and 2017. In spite of this, Mozambique remains one of the smallest economies in sub-Saharan Africa. The country's most pressing medium-term economic structural challenge is the diversification of the revenue base. Aid flows are expected to decrease, which could have a major effect on the economy.

Per capita GDP is forecast to grow at 7.4% between 2012 and 2017, coming off a very low base of just US\$634 per capita in 2012. Meanwhile, government spending is projected to increase by 10% as the state attempts to address infrastructure shortcomings. While consumer price inflation has been erratic, it has been declining overall since 2010 (reaching 1.1% in 2012).

This requires balancing the demands of maintaining the existing infrastructure while also completing the Moatize-Nacala corridor.

In addition, railway lines in Mozambique are still operating below capacity because there is a shortage of locomotives and wagons to run on them.

**The quantity of coal that Mozambique can currently produce exceeds its rail capacity.** This explains private sector interest in several rail projects, particularly since transporting coal by road is prohibitively expensive and inefficient.

As the narrow highway between the mines in Tete province and Beira is congested with trucks, Brazilian mining group Vale – a leading mining investor in Mozambique – is spending a total of US\$4.5 billion

with its governance and anti-corruption framework. Corruption is perceived to be widespread and bribe-seeking by officials is considered to be a problem. Red tape and government decisions can also be a barrier to doing business, as for example oil companies have not yet received the go-ahead to build the first platforms, with a deadline for gas exports to begin in 2018.

The tax regime is not too restrictive to business development and growth. However, the level of inefficiency created by the Mozambican tax bureaucracy heightens the cost of operating in the country. **The World Bank's Doing Business Project estimates it takes 230 hours, or twenty-nine 8-hour days, to become tax compliant.<sup>ii</sup>**

*line, but everyone has to buy their own rolling stock and the line's capacity is a constraint."*

**Vernon Harvey, consultant on African operations**

Despite being further away than Beira – with the railway line having to go through the south of Malawi and then north to Nacala – the Nacala transport option is seen as a better long-run solution for coal miners in the Tete region than the Sena/Beira line.

The refurbishment of the Sena railway line has repeatedly been delayed. Although mining companies have been able to use the line to transport coal, the trains cannot run at full speed and capacity is limited.

## PRICewaterhouse COOPERS MOZAMBIQUE



# CMA CGM Mozambique Profile - 2018

## Port Overview:

Located in central region of Mozambique. It acts as a gateway mainly for Zimbabwe, Malawi and Zambia.

### Multi-Purpose CONTAINER Terminal

- The Container Terminal covers 645 meters berth length.
- The Terminal projected capacity is 400.000 TEUs per year.
- Container Storage and Stacking facilities with 350.000 m2 well illuminated Container yard.

### Multi-Purpose CARGO Terminal

- The General Cargo Terminal covers 670 meters berth length. Projected capacity is 10 million Tons per Year.

### All EQUIPMENT for all kind of Cargo

- Ship to Shore Gantry cranes available - 50 Tons.
- Rail Mounted Gantry crane available with 50 Tons.
- Reach stackers – 45 Tons. Kalmar Forklifts - 16 – 45 Tons
- Terminal 4WD Tractors – 60 Tons. Pay loaders for multi-use, etc..



## Port of Nacala

CMA CGM



## Port Overview:

Located in north, it is one of the most important of the east coast of Africa. This port is the terminal of the Nacala Corridor, served by a railroad linking the coast to Malawi. The railroad begins in the town of Moatize, Tete province, where the largest mining operations of the country are developed.

### Multi-Purpose CONTAINER Terminal

- A Container Terminal with two berths with capacity to handle 100,000 TEUs per year.
- Length of berth: 372 meters; with a maximum depth of 15m at low tide.
- Storage capacity of 5,722 TEUS.

### Multi-Purpose CARGO Terminal

- A General Cargo Terminal with four berths and an annual handling capacity of 2,400,000 tons.
- Four warehouses occupying a total area of 12,050m2.
- Pier compliance: 610 m? - Draft Minimum: 7.5 m - Maximum: 10 m.
- The General Cargo Terminal covers 670 meters berth length. Projected capacity is 10 million Tons per Year.

### All EQUIPMENT for all kind of Cargo

- 5 bulk loading, 2 Evacuators, 2 2.5-ton forklifts, 8 grabs 3m³ and 2 grabs 8m³.
- Bagging machines, 12 Trucks and other equipment are available on request.



# Port of Maputo



## Port Overview:

Located on Africa's South Eastern coast, Maputo Port is a gateway to Southern Africa's vast economic hinterland. The port plays a major role in linking regional production, mining and commercial hubs to the market of South East Asia.

It has excellent land connections to South Africa, Swaziland, Zimbabwe and sea connections with Far East, Middle East and Europe.

## Multi-Purpose CONTAINER Terminal

- The Container Terminal covers 645 meters berth length
- The Terminal projected capacity is 400.000 TEUs per year
- Container Storage and Stacking facilities with 350.000 m2 Container yard.
- More than 400 reefer plugs.

## Multi-Purpose CARGO Terminal

- The General Cargo Terminal covers 670 meters berth length. Projected capacity is 10 million Tons per Year.

## All EQUIPMENT for all kind of Cargo

- Mobile Harbour Cranes - 100 tons, Reach Stackers - 45 tons.
- Empty Containers Top Lifter - 45 tons, Trailers - 60 tons, Tug masters - 60 tons
- Light forklifts - 3 tons, Rubber-Tired Gantry Cranes - 65 tons



# Port of Quelimane



## Port Overview:

Quelimane is a small sea port approximately 25 kms inland on the banks of the Lua River. It was the major point of export for regional agricultural products, mostly rice, cotton and forestry products, but with the decline of production during the civil war in the 1980's and '90's the port was neglected and fell into decline. At present the port is being completely renewed and overhauled, it has a new concrete quay of 250 m long.

## Terminal Information

- Two warehouses for general cargo with a combined storage area of 3,800 m<sup>2</sup>, both overhauled and are as new.
  - Open area container stacking yard for 800 TEU's with 18 reefer points for refrigerated containers.
  - A yard is specially prepared for forestry products and an equipment maintenance shed.
- At present the port has three 40 mt capacity top stacker and one 20 mt forklift in operation.

## EQUIPMENT

- Currently vessels have to be self equipped for discharge and/or loading operations.

# Local Services & Maps

## MOZEX West Bound



- Fixed-day weekly direct service between Asia and Mozambique with en-route calls in Indian Ocean.
- Optimum coverage of Mozambique with weekly calls at Maputo, Beira and Nacala.
- Mozambique is used as a gateway to reach East and Austral Africa land -locked countries Malawi, Zambia and Zimbabwe.

## NOURA 2



- Weekly service with a fleet of 5 vessels of 2200 TEU operated by CMA CGM.
- NOURA 2 service dedicated to Indian Ocean market will add 2 ports in Mozambique on a fortnightly basis.
- Direct link to Beira from UAE ports in 12 days, excellent transit from India West Coast in 22 days.
- Competitive transit time for Mozambique exports.

8

Beira Port –Top 3 Import



Rice



Chemical fertilizers

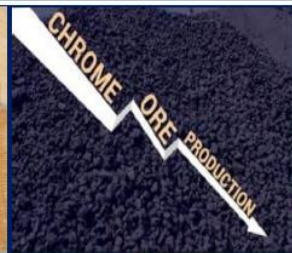


New pneumatic tyres

Beira Port –Top 3 Export



Wood



Chromium ores



Unmanufactured tobacco

**“Maritime Transport In Africa:  
Challenges, Opportunities, and an  
Agenda for Future Research”**

**Opportunity and Growth Diagnostic of Maritime  
Transportation in the Eastern and Southern  
Africa**

**By**

**Professor Godius Kahyarara**  
Economics Department

**With Assistantship of Debora Simon**  
Geography Department

**University of Dar-es-Salaam, United Republic of Tanzania**



## SUMMARY

This paper examines opportunities and undertakes growth diagnostics of maritime transportation in the Eastern and Southern Africa. To do so it adopts a 'Growth Diagnostic' methodology proposed by Ricardo Hausman, Dani Rodrick and Andres Velasco (HRV) to identify constraints that impede development of the Maritime transport focusing on a wide range of aspects within transportation corridors that are most critical and binding constraints to development of maritime transportation. The paper also assesses existing opportunities for Maritime Transportation and proposes the best approach to rip such opportunities. Paper findings are that port inefficiency depicted by longer container dwell time, delays in vessel traffic clearance, lengthy documentation processing, lesser container per crane hour (with exception of South Africa) as one of the critical binding constraints. Ultimately over 70 percent of delays in cargo delivery compose of time spent within Ports. The other binding constraint of maritime growth is inefficient rail and road networks in the form of low speed and unreliability (Railways), insecurity, congestion, delays in checkpoints, diversions due to frequent maintenance. A third constraint is inadequate volume of cargo to allow full capacity utilization of maritime transportation along with its interlinked modes. Transport cost higher than global average by 40 to 60 percent is another binding constraint. National transportation development plans compatibility with regional agreements on need for harmonization is also a binding constraint. Economic viability and loss making in other modes especially railways is a critical constraint. The last binding constraint is inadequacy in human resource and ICT system to support an efficient and effective integrated Port Management Information System to guarantee globally competitive and high-quality port performance. The economic growth of the region which is higher than the sub Saharan average and drive for industrialization along with ongoing ports improvement and Standard Railway Gauge projects are the greatest opportunities ever for maritime transportation in Eastern and Southern Africa. The study major recommendation is call for holistic and integrated approach, policies and institutional arrangement for effective Maritime Transportation. Countries are encouraged to consider merging ports, railways and freight services under one administration so as to maximize integrated decisions that guarantee connectivity of Railways, Ports, and Financial and telecommunication services for economically viable maritime transportation system. Finally, Maritime Transportation has a big role to play in Global trade and implementation of the *three pillars of Sustainable Development Goals*

### A comparative analysis of port selection in Southern Africa

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Dissertation submitted in partial fulfilment of the requirements  
for the degree *Masters of Commerce in International Trade* at  
the North West University

Supervisor: Prof S Grater

MAY 2018

**Table 4-1: Container port traffic for selected Southern African ports (2005-2015, TEUs thousands)**

Port	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Beira	54.30	54.27	71.17	85.72	92.24	105.00	160.20	170.60	166.00	166.01	170.00
Dar es Salaam	258.39	272.70	278.96	349.00	341.39	359.01	439.46	530.09	553.05	590.76	610.00
Durban	1 899.07	2 198.60	2 479.23	2 642.17	2 523.11	2 529.21	2 712.98	2 586.89	2 641.10	2 804.00	2 770.34
Walvis Bay	71.46	83.28	144.99	170.59	250.26	247.74	220.18	334.41	301.82	263.05	237.55

Source: Author's own compilation (2017) from annual reports (CFM, NAMPORT, TNPA and TPA) and port statistics databases (AAPA, African Port Statistics and Containerisation)

**Figure 4-1: Container port traffic growth rate for selected Southern African ports (2005-2015)**

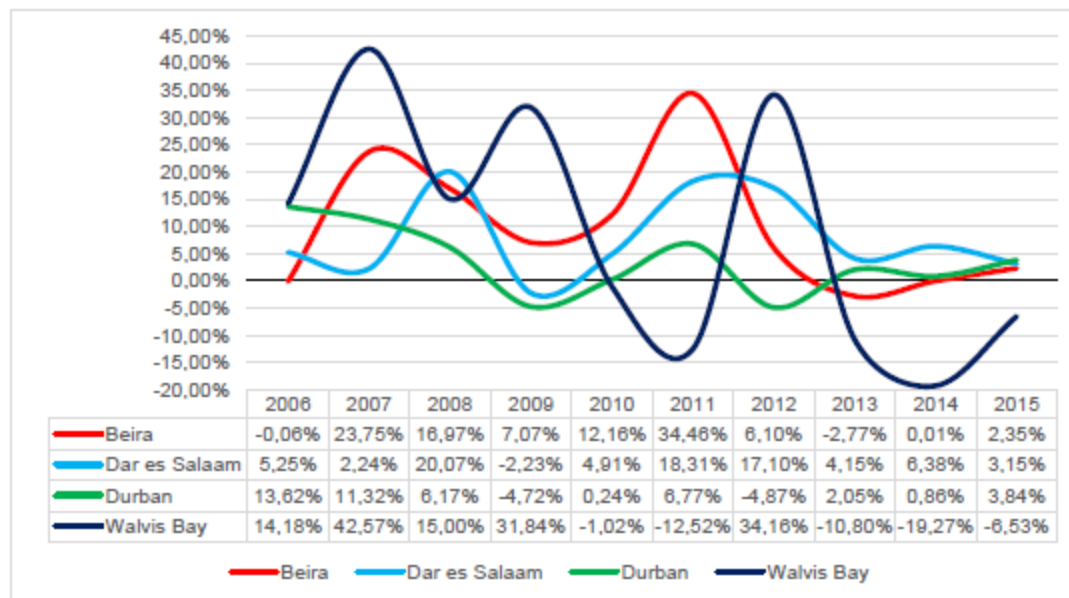


Table 4-3: Macro-economic profile of SADC countries for 2016 (US\$ billions)

Country	GDP	GDP Growth (%)	Export	Import	Trade balance	Trade (% of GDP)	GCI (out of 138)	Score (out of 7)
Angola	89.63	0.0%	27.39	10.64	16.75	42%	140*	3.04
Botswana	15.27	2.9%	7.32	6.10	1.22	88%	64	4.29
DRC	35.00	2.2%	4.55	4.13	0.42	25%	129	3.29
Lesotho	2.20	2.5%	0.90	1.33	-0.43	101%	120	3.57
Madagascar	9.99	4.2%	2.26	2.97	-0.71	52%	128	3.33
Malawi	5.44	2.5%	0.88	1.14	-0.27	37%	134	3.08
Mauritius	12.16	3.7%	2.19	4.65	-2.46	56%	45	4.49
Mozambique	11.01	3.8%	3.35	5.30	-1.94	79%	133	3.13
Namibia	10.27	1.2%	4.82	6.72	-1.91	112%	84	4.02
Seychelles	1.43	4.5%	0.56	0.76	-0.20	93%	97*	3.86
South Africa	294.84	0.3%	74.11	74.74	-0.63	50%	47	4.47
Swaziland	3.73	-2.2%	1.61	1.43	0.18	82%	123*	3.40
Tanzania	47.43	7.0%	4.40	7.69	-3.29	25%	116	3.67
Zambia	19.55	3.3%	5.31	3.99	1.32	48%	118	3.60
Zimbabwe	16.29	0.7%	2.83	5.21	-2.38	49%	126	3.41
Total	574.24	-	142.48	136.80	5.68	-	-	-
Average	38.28	2.4%	9.50	9.12	0.38	49%	107	3.64

Source: World Development Indicators (WB, 2017b); Trade Map (2017) statistics and Global Competitiveness Indices (WEF, 2014-2016).

Table 4-5: Cumulative weighted average in distance between selected Southern African countries and their top 10 trading partners (2005-2015, kilometres)

Country (Import)	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average:
Mozambique	4 472	4 299	4 373	5 816	5 330	5 718	5 542	5 906	4 561	5 056	5 645	5 156
Namibia	2 789	1 338	1 694	3 999	3 922	3 456	3 182	3 370	3 618	2 969	3 404	3 067
South Africa	7 674	5 685	5 609	6 775	6 914	6 747	6 764	6 657	6 948	6 910	7 247	6 721
Tanzania	4 577	3 895	3 830	4 374	4 531	4 906	5 064	5 079	5 335	5 489	5 272	4 759

Country (Export)	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average:
Mozambique	9 249	3 669	3 105	8 569	7 385	8 850	8 077	7 808	6 813	6 473	6 783	6 980
Namibia	6 051	3 595	5 622	6 016	5 141	5 211	5 312	4 670	3 519	5 070	3 944	4 923
South Africa	7 674	6 280	5 967	7 225	6 583	6 055	5 632	5 009	5 192	4 930	5 140	5 972
Tanzania	5 178	4 107	2 918	5 223	5 861	5 678	6 129	5 436	4 573	4 876	3 888	4 897

Source: Author's own calculations based on trade data from Trade Map (2017) and distance calculations from Searates (2017).

**Table 4-8: Current port infrastructure for selected Southern African ports and the Port of Shanghai**

Port	Port size	Harbour size	Harbour type	Shelter	Holding ground	Max vessel size	Container berths	Berth length
Beira	Medium	Medium	River natural	Good	No	>500 ft	4	645m
Dar es Salaam	Large	Medium	Coastal natural	Good	Yes	>500 ft	4	735m
Durban	Large	Large	Coastal breakwater	Good	Yes	>500 ft	10	2 578m
Walvis Bay	Small	Small	Coastal natural	Good	Yes	>500 ft	8	1 356m
Shanghai	Very large	Large	River natural	Good	Yes	>500 ft	125	20 000m

*Source: Author's own compilation based on information from annual reports (CFM, NAMPORT, TNPA and TPA) and Searates (2017).*

**Table 4-9: Crane operations for selected Southern African ports and the Port of Shanghai**

Port	100+ Ton lifts	50-100 Ton lifts	25-49 Ton lifts	0-24 Ton lifts	Fixed cranes	Mobile cranes	Floating cranes
Beira	No	No	Yes	Yes	Yes	Yes	No
Dar es Salaam	Yes	No	Yes	Yes	Yes	Yes	Yes
Durban	Yes	Yes	Yes	Yes	No	Yes	Yes
Walvis	Yes	No	Yes	Yes	Yes	Yes	No
Shanghai	Yes	Yes	Yes	Yes	Yes	Yes	Yes

## REPUBLIC OF MOZAMBIQUE

**A Preliminary Assessment of Damage  
from the Flood and Cyclone Emergency  
of February-March 2000**

WORLD BANK



Table 1: Preliminary Estimate Of Disaster-Related Costs (US\$ Millions)				
	Costs			
	Direc	Indirect	Relief	Reconstruction
Food aid	–	–	35.5	–
Health	15.7	*	5.2	25.8
Education	18.7	*	0.5	37.3
Housing and private property	29.1	*	6.0	43.6
Government property	5.2	–	–	10.2
Sub-total: Social Sectors	68.7	*	47.2	116.9
Water and sanitation	13.4	*	6.6	13.4
Energy and telecommunicatio	13.6	10.7	–	15.5
Roads	47.0	30.0	11.0	87.2

Railways	7.3	10.7	–	49.2
Sub-total: Infrastructure	81.3	51.4	17.6	165.3
Agriculture**	57.9	63.0	–	57.9
Livestock	7.9	0.8	–	7.9
Fisheries	8.5	6.1	–	8.5
Industry*	25.7	68.0	–	30.8
Trade	15.7	15.0	–	15.7
Tourism	2.0	10.5	–	2.5
Sub-total: Productive Sectors	117.7	163.4	–	154.2
Sub-total: Environment	2.0	–	–	2.8
Sub-total: Disaster Prevention	3.4	–	–	19.4
Grand Total	273.1	214.8	64.8	427.7
Source: The World Bank. Notes: * Less than \$500,000. ** Lost sugar cane production is included in agriculture; lost refined sugar production is included in industry. See text for definition of column headings.				

Third, costs to the private sector are estimated to total about \$130 million in direct costs, including costs to housing and private property (\$29.1 million), agriculture (\$41.5 million), livestock (\$7.9 million), fisheries (\$8.5 million), industry (\$25.7 million), trade (\$15.7 million) and tourism (\$2.0 million). Indirect losses in these sectors also fall to the private sector and are estimated to be quite high, at about \$190 million. The indirect costs of damage to the roads network is estimated to be about \$30 million and these fall to the private sector as well.

Fourth, relief costs as calculated in Table 1 understate total costs for the relief effort as they are limited to costs associated with providing basic services and attempt strictly to exclude rehabilitation or reconstruction costs. The estimated total, \$64.8 million, is therefore significantly less than the \$160.5 million which the Government indicated to be the gross requirement for the emergency response in its most recent International Appeal, prepared in collaboration with the UN and issued on March 22, 2000. Items such as road repair; building repair; and the provision of goods and services that are provided to restore livelihoods are included as direct costs of the disaster, and not as relief costs, though some of these items were included in the Appeal. At the same time, except for food aid, Table 1 does not attempt to capture extraordinary relief costs (e.g. for family reunification and emergency (air-borne) rescue operations) that would significantly add to the relief costs total.

Fifth, estimates of reconstruction costs are highly preliminary, as specialists have only just begun to identify and cost out effective risk-reducing strategies for sectoral activities in the affected areas. Moreover, the decision whether to rebuild to improved standards can only be determined by assessing the exposure of the relevant asset to catastrophic losses and the economic impacts of these losses. This involves informed speculation on the probability of severe flooding on the affected flood plains or exposure to other hazards in the future. Based on death and damage tolls from floods in 1970 and 1977, it is clear that flooding in these areas periodically reaches magnitudes that are sufficient to cause extensive damage and loss of life. Every effort must be made to reduce the human costs of these events, and to incorporate loss exposure levels into standard model projections to obtain a realistic view of an asset's probable returns and insurance needs.

## II. THE CONTEXT

### HISTORY OF THE FLOOD DISASTER

From February 4 to 7, 2000, due to the effects of cyclone Connie, Maputo city received 455 mm of rainfall, or nearly half the average annual total. Similar exceptionally heavy rains across southern Mozambique exacerbated normal seasonal flooding, inundating low-lying areas. From February 20 to 22, heavy rainfall associated with cyclone Eline boosted rainfall totals in neighboring South Africa, Zimbabwe and Swaziland, filling reservoirs on river basins draining through southern Mozambique and triggering more extensive flooding, particularly along the Limpopo, Incomati and Umbeluzi rivers. It was the first time in recorded memory that all three river systems flooded at the same time in Mozambique. Although flooding has receded from peak levels recorded in early March, continuing rainfall together with releases from dams upstream have kept river levels high, perpetuating flood risks and slowing the drainage of river basins back to normal seasonal conditions. In early March, heavy rainfall affecting the Save, Buzi and Pungoe river basins threatened to cause additional flooding in these areas further to the north. As of March 25, river levels and rainfall patterns have not completely returned to their normal states, with the consequence that ecological systems continue to be in perilous condition and renewed flooding remains a distinct possibility.

Table 2: Direct Losses in the Agriculture and Livestock Sectors (US\$ m)				
	Public	Smallholder	Commercial	Total
Annual crops		20.95	2.73	23.68
Plantation crops			3.29	3.29
Sub-total: Cultivation		20.95	6.02	26.97
Productive infrastructure	16.40	2.17	0.07	18.64
Admin. infrastructure	0.02			0.02
Equipment	0.01		11.38	11.39

<b>Tools</b>		0.89		0.89
<b>Sub-total: Capital assets</b>	16.43	3.06	11.45	30.94
<b>Sub-total: Livestock</b>		7.90		7.90
<b>Total</b>	16.43	31.91	17.47	65.81
<i>Source: MADR and Agricultural Provincial Directorates (DPADRs).</i>				

Flooded planted areas, which mostly supported maize and rice, totaled about 140,000 hectares, or 12 percent of cultivated land in the affected region, including 90 percent of the country's irrigated land. The largest impact was in Gaza (accounting for 43 percent of the flooded cultivated land), followed by Maputo (31 percent) and Sofala (18 percent). Assuming constant yields across hectares, up to 21 percent of expected agricultural production in the affected region, or 7 percent of expected national production, was lost (see Table 3). In a normal year, the region produces 57 percent of Mozambique's sugar, 32 percent of its cashews (chiefly a highland crop), and just one percent of its cotton. Although the region's rice and maize output may be sharply reduced, the overall impact on national exports will be relatively small, provided that exports under the United States sugar quota remain at the current level. Moreover, to the extent that a post-flood yield on flooded land is realized in the 1999/2000 season, crop losses will be revised downwards. The most heavily affected crop was sugar cane. The Maragra sugar plantation (just about to enter production for the first time) was inundated and totally lost, and the Xinavane and Buzi plantations reported 10 percent losses, implying that almost 50 percent of Mozambique's projected can and sugar production are lost.

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MAE has estimated that the reconstruction and refurbishment of public buildings will cost about \$10 million in total (see Table 8). Of this, \$6 million is estimated to be required for the reconstruction of public buildings in new locations. A World Bank estimate of direct damages, made on the basis of limited site visits and consideration of salvage opportunities, totals about \$1 million, assuming that rehabilitation will be favored over relocation. Losses in municipal revenues are difficult to estimate, chiefly because an accurate accounting of annual revenues is not available for Xai Xai and Chokwe. Recent data on municipal revenues (see Table 9) suggest that these two communities, which together have a population almost twice as large as Pemba, collect about \$280,000 in own-source revenues per year and so will lose about \$23,000 to \$24,000 of revenue per month until collection is reestablished. This should occur fairly soon after the flood waters receded, keeping actual losses relatively low. The costs of recreating lost records has not been estimated, but could be substantial in terms of Government capacity.

Reported energy sector losses total \$13.6 million in damage to physical infrastructure, mostly on the EDM system in Gaza and Maputo provinces. Reported damages in the gas and petroleum sectors are negligible, though oil companies have not yet completed their assessment of the impact on the fuel depot and filling stations in the area. Until damages are repaired, power sector revenues will decline by about \$300,000 a month, and cash expenses will increase by about \$900,000 per month, as bulk electrical power is imported from South Africa to cover the domestic shortfall. Indirect effects on the economy are more difficult to estimate, because public services and industrial output in most locations have been affected not only by failures in power supply but also by other factors (e.g. closed roads or flooding to the industrial site). Some of these other factors may take longer to address than power supply.

	110 kV transmission line near Moamba	700
	66 kV sub-transmission line in Maputo	800
	Maputo province rural network	3,650
	Gaza province rural network	3,700
	Beira network	270
	Inhambane province rural network	140
	Manica province rural network	230
	Other infrastructure	1,000
<b>Total EDM</b>		<b>12,390</b>
<b>Non-EDM isolated systems</b>		<b>720</b>
<b>Hidroelectrica Cahora Bassa (HCB)</b>		<b>500</b>
<b>Total</b>		<b>13,610</b>
<i>Source: EDM, MIREME</i>		

**Electricity:** *Electricidade de Mocambique (EDM):* EDM has suffered over \$12 million in damage to its networks, with \$11.5 million occurring in Gaza and Maputo provinces. This includes



*Rehabilitation of Municipal Roads:* ANE has made very preliminary estimates of damages to the roads Maputo, Matola, Xai Xai and Chokwe. These total about \$15.2 million.

Table 14: Damages to the Road Network (US\$ million)		
	Direct costs	Reconstruction*
Primary and secondary roads	22.7	39.8
Tertiary roads	9.1	16.0
Maputo streets	6.5	13.4
Matola streets	5.1	10.5
Xai Xai streets	2.1	4.3
Chokwe streets	1.5	3.2
<b>Total</b>	<b>47.0</b>	<b>87.2</b>
<small>Source: ANE and World Bank estimates. * The weighted average of reconstruction costs is 1.6 times direct costs, assuming a 50 percent reduction in loss exposure for drainage and major structures.</small>		

Within CFM, water damage was limited to CFM-S. Damage was very severe along the Limpopo line linking Maputo with Zimbabwe. It runs directly through the flood areas of the Limpopo, and as of March 23 parts of the line were still not accessible. There has been substantial destruction of bridges, culverts and railbeds, though in many places, rails and sleepers are not only intact, but remain connected, albeit sometimes suspended in the air. The main damage was caused on sections of the railbed, which were washed away, rather than on bridges and other concrete structures; but one major bridge at Aldeia da Barragem was partially destroyed. The impact on the Goba and Ressano Garcia lines was small and localized. Points requiring repair were easily reached and traffic was restored quickly. Additional works are required to bring these lines back to the pre-flood standard. The Maputo port suffered slight damage to a few short rail line sections. In Beira port (an area otherwise little affected), flooding caused considerable destruction in the fishing harbor.

CFM has carried out a preliminary assessment of necessary repair works. Immediate works to restore limited rail service will cost about \$7.3 million. Work on the Goba and Ressano Garcia lines (\$400,000) was started immediately and is continuing. Work on the Limpopo line (\$6.9 million) has not yet started as the line remains inaccessible. This work will also require external financing, as CFM does not have the necessary resources, and it is expected to take four to six months. Current estimates for full reconstruction of the line (totalling \$27 million) are very preliminary as they are based on average figures for reconstruction elsewhere and not supported by site visits or engineering studies. The estimate includes provision for measures to prevent similar damage from future flooding.

## THE PRIVATE SECTOR

Since 1995, almost \$3.6 billion in projects has been approved by the Investment Promotion Center. Of this, about 15 percent (or \$540 million) is in the affected areas (Gaza, Inhambane, Manica, and Sofala). Flood damage to commercial interests in the private sector in these provinces come in several forms:

- Loss and damage to the physical assets and inventory associated with the enterprise;
- Loss of production or sales due to damaged public infrastructure (including in particular power outages and transportation failures); and
- Loss of employment due to loss of production or sales

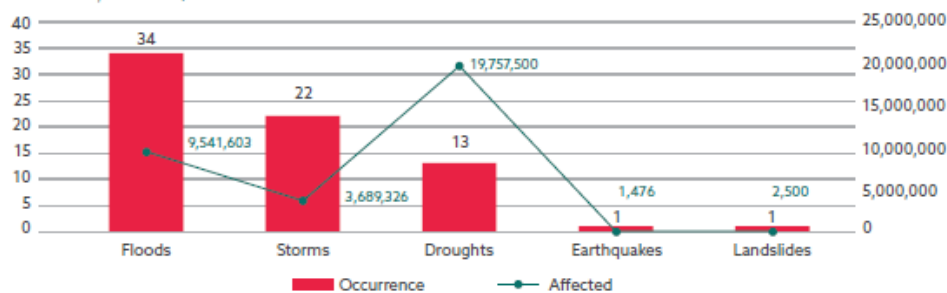
These have also affected Mozambique's balance of payments, as export volumes have decreased and import needs increased (both to substitute for reduced domestic production and to provide inputs to the reconstruction effort). The precise extent of damages will not be known for several months, when detailed surveys (to be undertaken by the Government with support from UNIDO and USAID) near completion. The following estimates are at best indicative.

The private sector, as the engine of growth, requires special support from Government and donors so that it can attempt to revitalize itself in an effort to return to economic levels prior to the floods. People have lost not only their homes but also their livelihoods and, until productive activities can be resumed, these people will be dependent on external assistance. Increased rates of unemployment have been a secondary effect. Even small enterprises may affect the lives of hundreds. For example, the fish processing plant in Xai Xai indirectly supports several hundred fishermen and the inundated banana plantation affects several thousand banana peddlers who have lost the source of their product. These secondary effects are very difficult to quantify, but they cannot be ignored. Without some form of intervention, (e.g. in the form of direct matching grants or subsidized credit), small and medium enterprises may be unable to recoup the losses to agricultural crops, animals and equipment. This in turn may increase social pressure in Maputo city, as more and more people immigrate from the rural areas seeking work, increasing demands on the city's infrastructure, and possibly resorting to crime to support themselves.

**Tourism:** Lost revenues in tourism are expected to be substantial, adversely affecting Mozambique's foreign exchange position. Although Maputo and the affected areas have received large numbers of foreign visitors as a result of the disaster, partially offsetting lost tourism revenues, tourist destinations in the country as a whole are likely to have significantly reduced bookings for the usually busy Easter season. This is true for several reasons:

## Financial Protection against Disasters in Mozambique

FIGURE 1. OCCURRENCE OF DISASTERS IN MOZAMBIQUE  
(TYPE OF THREAT, 1956-2016)



Source: World Bank Group estimates based on EM-DAT data (2018).



sources including the Emergency Events Database (EM-DAT), DesInventar, and Ministry of Planning and Development. In sum, these data provide an overview of the country's hazard profile.

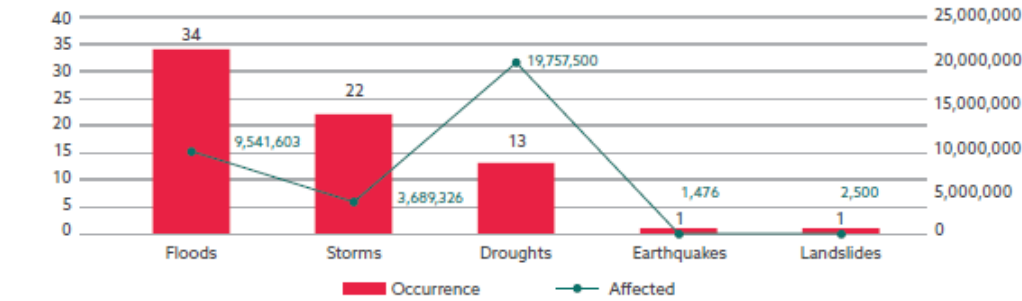
The Emergency Events Database (EM-DAT) recorded 71 events (droughts, earthquakes, floods, landslides, or storms) in Mozambique between 1956 and 2016. Of the total recorded, there were 56 floods or storms, 13 droughts, one earthquake (the 2006 Great Earthquake) and one landslide. Together, they affected nearly 33 million inhabitants (Figure 1).

diversity of economic and social impacts caused by the different natural hazards.

The DesInventar database recorded 1,315 events in Mozambique's provinces (741 droughts, 437 floods, and 137 cyclones) in Mozambique between 2000 and 2012. The data cannot be used to calculate the frequency of disasters because the same event can be counted multiple times if it affected more than one province. But the data can be used to calculate the occurrence of natural hazards in a province (Figure 2).

All provinces suffer recurrent disasters, with some

**FIGURE 1. OCCURRENCE OF DISASTERS IN MOZAMBIQUE**  
(TYPE OF THREAT, 1956-2016)



Source: World Bank Group estimates based on EM-DAT data (2018).

affected more frequently by droughts and others by floods. Gaza, Inhambane, and Tete reported more droughts, while Sofala, Tete, and Zambézia reported more floods. Nampula suffers the highest number of cyclones.

Other sources indicate more disasters in roughly the same period. Axco reported, in addition to the 2006 earthquake, a further five earthquakes in Mozambique since 2002 (Table 1).<sup>6</sup>

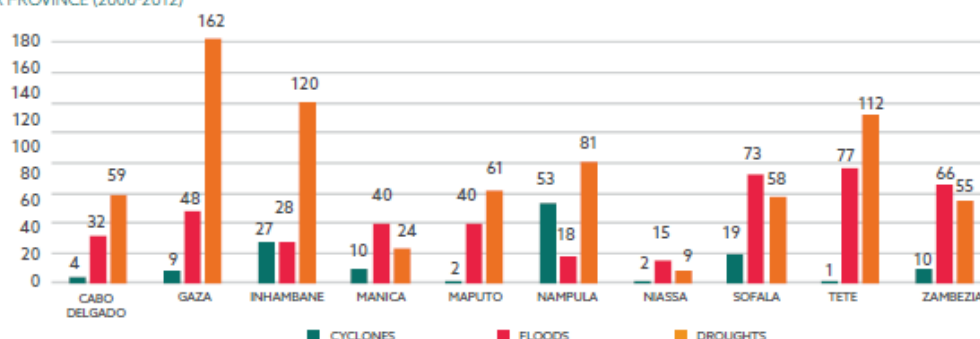
In short, based on the information available, it is possible

of collecting, assessing and managing disaster data. Improving the systems for recording and managing data on the occurrence of disasters in Mozambique can allow for more detailed analysis.

## 2.2. Recent Disaster Damages and Losses

Mozambique does not have a consolidated series on the damages and losses caused by disasters. The information on the economic impacts of disasters identified within

**FIGURE 2. OCCURRENCE OF DISASTERS IN MOZAMBIQUE**  
PER PROVINCE (2000-2012)



Source: Prepared by the World Bank with data from DesInventar.

they are available in Post-Disaster Reconstruction Plans for major events over the last 18 years: the Ministry of Planning and Finance (2000 and 2001) and the Ministry of Planning and Development (2007, 2013, and 2014).

The macroeconomic impacts of extreme events have been significant in Mozambique. The costs estimated for the 2000 events totaled almost US\$450 million (at current values), almost 9 percent of gross domestic product (GDP). In 2013, the sum exceeded US\$517 million (at current values), over 3 percent of GDP. The 1984-2014 and 2000-2014 annual averages were (at 2016 values) MZN 4,129 million and MZN 7,543 million (Figure 4).

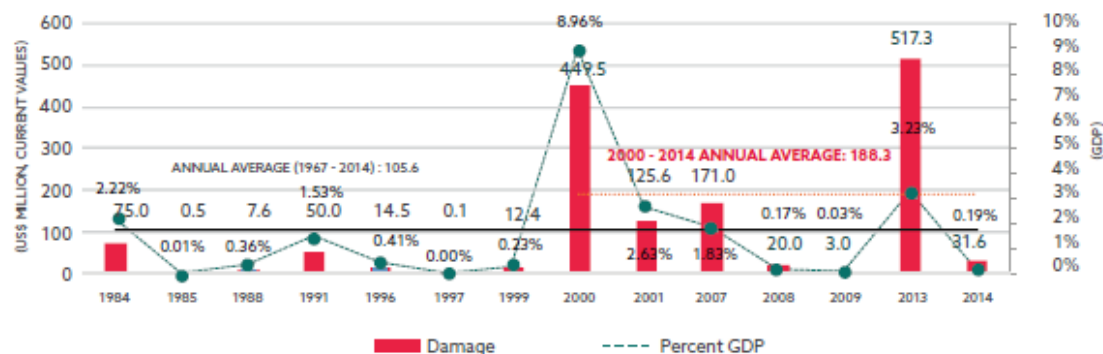
The significant difference between the average losses in the two periods may be a result of: (i) greater impact of more severe events (the 2000 event was considered the worst in 100 years and the 2013 floods were equally severe in magnitude (10 meters in 2000 and 9.8 meters in 2013); (ii) accumulated impact of more frequent events;

million in damages. The average annual damages caused by droughts in the agriculture sector are estimated at US\$20 million. And, a 100-year return period earthquake could cause damages of US\$440 million or higher. These preliminary results are being further validated and calibrated. The final results should be available in the following months.

### 2.3. Collection and Management of Data from Disasters

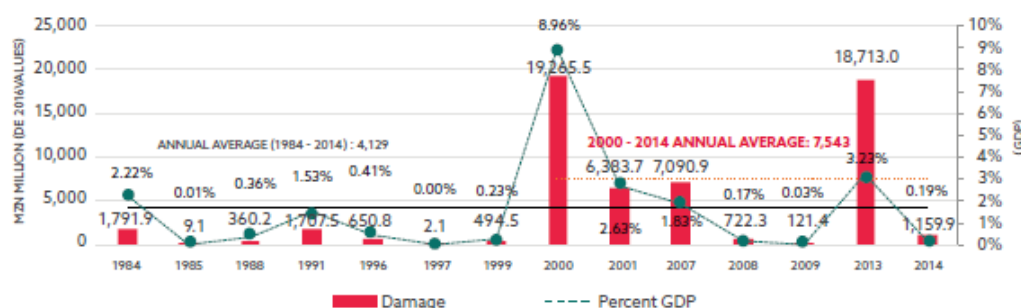
In Mozambique, disaster data and information are recorded in an official form and flow through three main trigger points; the outputs inform strategic annual reports and budgetary allocations. The country faces difficulties and gaps in collecting disaster data, assessing the resulting losses and damages, and managing the information about disaster events and their impacts. It is currently exploring international best practices for the collection and management process.

**FIGURE 3. PROFILES AND TRENDS (1984-2014) ON THE COST OF DAMAGES CAUSED BY DISASTERS**  
DISASTER DAMAGES IN MOZAMBIQUE BASED ON AVAILABLE DATABASES (US\$ MILLION, CURRENT VALUES)



Source: World Bank Group estimates based on EM-DAT data, DesInventar data, and Ministry of Planning and Development (2018)

**FIGURE 4. DISASTERS DAMAGES IN MOZAMBIQUE**  
BASED ON AVAILABLE RECORDS (MZN MILLION, 2016 VALUES)



Source: World Bank Group estimates based on EM-DAT data, Desinventar data, and Ministry of Planning and Development (2018).

To this end, the INGC is engaged in dialogues with International partners to institutionalize the process to assess disaster damages and losses. The objectives include formalizing the procedures to collect and manage disaster data and information and establishing an official methodology for the valuation of disaster impacts. Such methodology will be based on International best practices but adapted to the local context. The proposed activities are expected to inform the preparation of specific regulation for the Disaster Law and provide inputs for the revision of the INGC statute.

Promoting and including the Ministry of Economy and Finance in these discussions is important so that the ongoing and upcoming reforms consider and incorporate the country's disaster risk financing needs. Improving the disaster damage and loss assessment systems should be part of the core activities in developing a financial protection strategy against disasters in Mozambique.

The next chapter describes the main sources of funding for disaster management activities in Mozambique, from preparedness and emergency response to recovery and reconstruction.

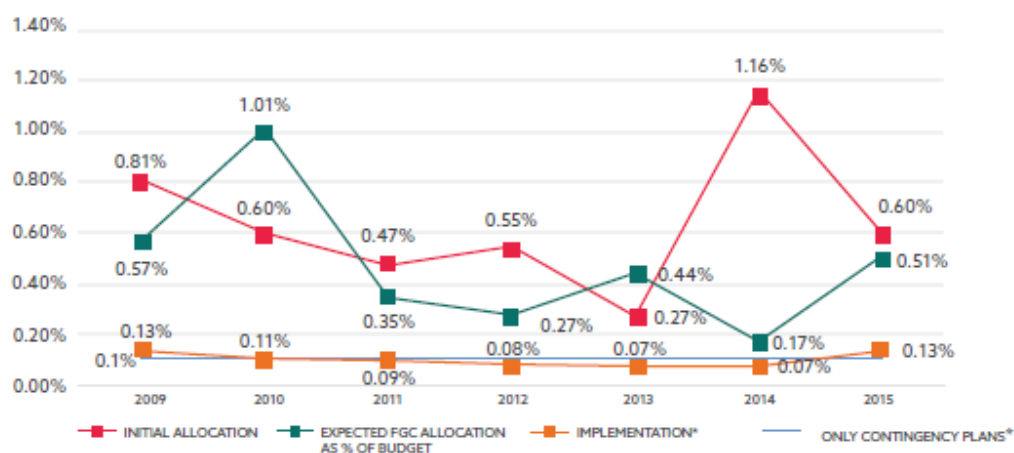
**TABLE 2. SOURCES OF FUNDING CURRENTLY AVAILABLE IN MOZAMBIQUE**

AVAILABLE INSTRUMENTS			
Instrument	Risk Layer	Timing of Mobilization	Additional Information
Annual Contingency Plan <sup>a</sup>	Low, medium, and high risk	Ex-ante	Annual contingency plans cover only the emergency response phase and are the main ex-ante source of funding available in Mozambique. Between 2009 and 2015, initial allocations ranged from 0.07% to 0.13% of the State Budget. From 2009 to 2015, the average annual allocation was MZN 148 million. In 2015, the initial allocation of MZN 271 million was the highest since 2009.
Donor Community	Medium and high risk	Ex-post and Ex-ante	Donor community operations are a significant source of financing and are off-budget, difficult to monitor and predict. From October 2013 to March 2014, donor support for the annual contingency plans was estimated at MZN 283 million. In 2013, the contingency plan disbursed MZN 167 million.
Emergency Loan	High risk	Ex-post	Emergency loans are unpredictable, require long negotiations that cause significant delays in the recovery and reconstruction phases, and are difficult to monitor. Following the 2015 floods and 2016 droughts, a US\$60 million World Bank Group loan financed part of the reconstruction activities.

TABLE 3. ALTERNATIVE SOURCES OF FUNDING UNDER CONSIDERATION IN MOZAMBIQUE

INSTRUMENTS UNDER DEVELOPMENT			
Instrument	Risk Layer	Timing of Mobilization	Additional Information
Disaster Fund	Low, medium, and high risk	Ex-ante	The main objective of the disaster fund is to guarantee the timely allocation of resources for disaster response. Annual allocations must correspond to at least 0.1% of the State budget.
Sovereign Insurance <sup>a</sup>	High risk	Ex-ante	Sovereign insurance is under development. Coverage might include floods, droughts, and cyclones. Coverage will be limited by the availability of resources to pay the premium. Maximum coverage for each hazard is US\$30 million.
Contingent Credit	Medium and high risk	Ex-ante	Under consideration.
Disaster Private Property Insurance and Microinsurance	Low, medium, and high risk	Ex-ante	Under development with pilot projects ongoing in the agriculture sector. Disaster property insurance has very low penetration (overall insurance penetration in the country is low, estimated at 1.58% in 2015). Insurance of public assets is allowed but not widespread across government institutions.

FIGURE 5. POST-DISASTER-RELATED SPENDING AS A PROPORTION OF BUDGET, 2009–2015



Source: World Bank Group estimates based on Boost dataset, Ministry of Economy and Finance reports, and INGC information (2018).

# Disaster Risk Assessment in Mozambique

## A Comprehensive Country Situation Analysis

Table 5: Information needs for cyclones, floods and drought risk assessments

<b>Cyclone, flood and drought risk assessments</b> (INGC et al., 2003)	Extent of geographic area affected and number of people in that area
	Number of people who require rescue (*)
	Infrastructure and communications systems damage (*)
	Housing damage (*)
	Crop damage
	Temporary shelter needs (*)
	Water/sanitation needs
	Food needs
	Medical/health needs
	Material assistance needed
	Logistics information for transport and communications (INGC et al., 2003)
<b>Food security assessment</b>	Hazards: drought, floods, cyclones, prevalence of diseases in plants, animals, humans, landslide and earthquakes
	Underlying factors: Climate, poverty and fragile livelihoods, food reserves, markets, limited options, chronic malnutrition, limited delivery of services for health, water, and sanitation, increase in the effective dependence ratio and government policies
	Key population groups: Marginal households (very poor), low income labourers (poor households), households with lower dietary diversity (very inadequate diet), poor households in the peri-urban areas
<b>Sanitary and nutritional vigilance</b>	Hazards: Drought, floods, cyclones, prevalence of diseases in plants, animals, and humans; key population groups: children in disaster-prone areas; Variable of control: Insufficient Growth (IG); Low Birth-Weight (LBW);

Note: (\*) Information that is required only in a sudden-onset event like a flood or cyclone