Stakeholder Engagement Workshop on Strengthening the Capacities for Observation and Risk Assessment in the Context of Loss and Damage

29 – 30 October, Bonn, Germany

Multi - Hazard Early Warning System for Extreme and Low-Onset Events

Contribution of the Republic of Mozambique

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1. Background

Mozambique is a country located in Southeast cost of African with a population of about 29 million people (14,000,000 Male/15,000,000 female), according to the census of 2017:

The Gross Domestic Product is $37.386 Billion (2017 est.)

Natural Resources: Coal, Titanium, natural gas, hydropower, graphite, tantalum

Agricultural is considered the economic activity of the country .

2. Hydrometeorological Hazards in Mozambique

Mozambique is vulnerable to the impacts of extreme weather-, water-, and climate events. On average droughts impact every 3 to 4 years. Floods of different magnitude, every year, in some part of the country, which are exacerbated by the fact that Mozambique is downstream 9 of the 15 major river basins in Southern Africa with more than 50 % of the territory covered by international river basins and more than 50% of the total annual runoff originating outside the country.

Being a downstream country makes Mozambique is also vulnerable to reduced river flows in cases of drought due to the use of water by upstream countries

Additional elements that contribute to the countries' vulnerability to floods include the geomorphological characteristics with approximately 40% of the countries topography under less than 200 m above sea level , changes in land use and vegetation cover.

The biggest floods recorded recently were those of the year 2000, which caused the death of 700 people, affected 2 million people and caused economic damages estimated at USD 600 million; and the floods of 2015. With a long coastline of 2700 km in the South West Indian Ocean, the country is in the path of tropical cyclones formed or that cross the western part of the of the Indian Ocean basin.

3. Multi-Hazard Early Warning Systems for Extreme and Low-onset Events

- Early warnings are an essential component of disaster risk reduction. They prevent loss of life and contribute to reducing the socio-economic impacts of extreme hazard events.

- According to WMO (2018) to be effective, they must consist of the following 4 elements, namely: disaster risk knowledge based on systematic collection of data and disaster risk assessment; detection, monitoring, analysis and forecasting of hazards and possible consequences; dissemination of authoritative, timely, accurate and actionable warnings and associated information on potential impacts by an officially designated source; and preparedness at all levels to respond to the warnings issued and to build back better in recovery, rehabilitation and reconstruction.

- These 4 elements must be underpinned by: effective governance and institutional arrangements, including effective coordination and collaboration of the **key institutions and stakeholders**; a multi-hazard approach to early warnings; involvement of concerned communities and stakeholders, including local communities and appropriate consideration of gender, age, disability and cultural issues.

4. Monitoring, Forecasting TC-IDAI
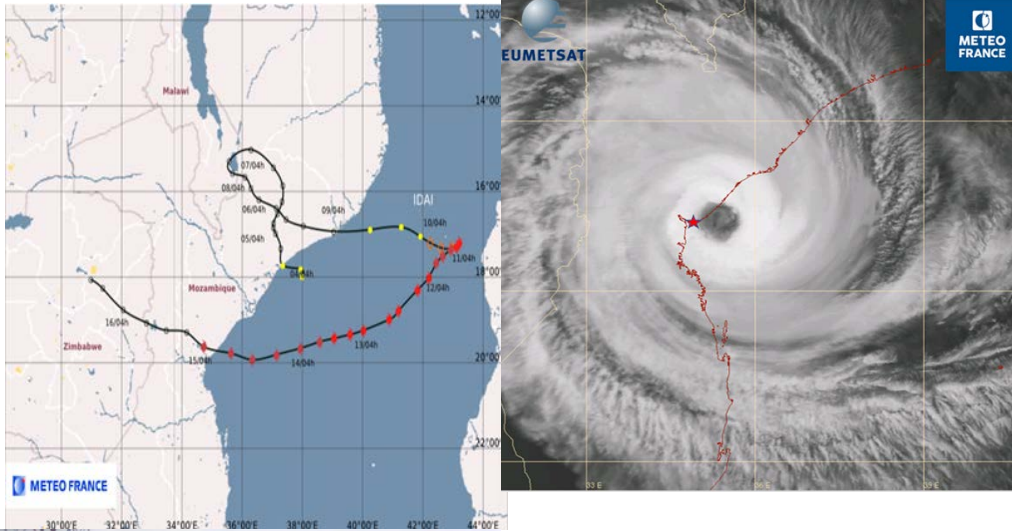
- In March 2019, the central region of Mozambique was affected by intense tropical cyclone which caused loss of 603 lives and impacted socioeconomic infrastructures (cut of communication lines, power outage, road cut, hospitals).

- In April 2019 other intense tropical cyclone –Kenneth- hited the northern part of Mozambique

5. Meteorological Observation Network

- For the monitoring and forecasting of meteorological extreme weather events such as cyclones, windstorms, floods, etc, a dense ground meteorological observation stations is required.

- In Mozambique this is the one of the main constraints. The climatic observation network is mostly manned and sparcialy not well distributed.

- During the two tropical cyclones many areas were affected by heavy rains with 300 milimeters of rainfall in less than 6 hours that were not possible to measure.

6. Challenges on Multi-Hazard *Early Warning Systems in Mozambique*

- For the monitoring and forecasting of meteorological extreme weather events a dense meteorological observation stations is required.

- It needs also weather radars, lightning detection system.

- Inventory and evaluation of the existing EWS (Early Waning and Early Action) in the affected region, including training to the local communities.

- Immediate Installation of multi-hazard EWS (new design required to fit with new SOPs and updated mapping systems) / technical recovery of affected flood and cyclone early warning systems.

- Updating of the Multi-Hazard risk maps and scenarios, assessing new exposure and vulnerabilities caused by the catastrophe.

- Establishment of an integrated national Multi-hazard (flood, cyclone, heat Health, storm surge etc) with detailed SOP in line with the DRR Master Plan 2017-2030.

- Early Warning Early Action Protocols and Early Warning Systems (technology)

6.1 Building institutional response resilience

- Develop a business/services/operations continuity plan for national and local Multi Hazard Early Warning systems to ensure equipment is maintained and trainings are consistently delivered for continuity of effectiveness of preparedness and response systems, including a longer-term capacity building strategy and plan.

- Multi Hazard Early Warning systems to ensure equipment is maintained and trainings are consistently delivered for continuity of effectiveness of preparedness and response.

The pictures show different scenarios during the tropical cyclone intense Kenneth. Source: INGC, 2019

Low-onset extreme event occurred in Lichinga, northern of Mozambique on 14 October 2018

Video:cortesy of Provincial Meteorological Office of Lichinga - Niassa

Many thanks

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