African Union

Catalysing risk-informed early action in Africa:

investing in multi-hazard early warning systems to strengthen resilience to disaster risk

The multi-hazard early warning system in use (photo credit: African Union, 2022)

Summary

Africa has become increasingly exposed to frequent and intensified threats of hazards, such as floods, droughts, cyclones, earthquakes and landslides, which are causing increased disaster losses and mortalities affecting more than 460 million people, resulting in one million deaths and significant economic losses costing several billions of US dollars.[1] *As part of efforts to minimise disaster losses, the AU Commission, with the support of the Italian Government, United Nations Office for Disaster Risk Reduction (UNDRR) and Centro Internazionale in Monitoraggio Ambientale Research Foundation has established the Africa Multi-Hazard Early Warning and Early Action System (AMHEWAS) Programme to improve the availability, access and use of disaster risk information for early warning and action across the continent. The AMHEWAS Programme aims to operationalise the Africa Institutional and Operational Framework for Multi-Hazard Early Warning and Early Action, which was developed with the support of the Government of Sweden and the United Nations Development Programme (UNDP). It, therefore, calls on the support of Regional Economic Communities (RECs) and Member States to utilise the availability of the Early Risk Information to enhance preparedness and coordination for early action, to mitigate the impact of the disasters.*

Catalysing risk-informed early action in Africa: investing in multi-hazard early warning systems to strengthen resilience to disaster risk

Key Messages and Policy Pointers

Understanding the scale and distribution of hazards

The management of disaster risks in Africa requires that the nature, scale and distribution of hazards and risks are known and better understood. This also enhances the knowledge of what and who is exposed to the potential impacts of hazards - both within countries, across national borders and wider regions, and the appropriate actions that can be taken to mitigate the adverse impacts.

Multi-hazard early warning systems backed up by interoperable situation rooms' enhance member states' capacities to respond to hazards

The AU's establishment of the Africa Multi-hazard Early Warning and Early Action Systems (AMHEWAS) Programme, including establishment of interoperable situation rooms is an important investment to understand the scale and distribution of hazards across Africa. Effective operationalization of AMHEWAS will institutionalise and coordinate the provision of early warning at different scales including continental, regional, and more localised levels to support the capacity of Member States to respond proactively to disaster risk.

Bridging the early warning – early action gaps

The AMHEWAS provides a comprehensive approach to disaster preparedness and advance early action of Member States and thereby bridging the warning-early action gap through a number of distinct means. This includes the curation of systematic (daily/24-hour) risk knowledge and data, hazard monitoring with dedicated staffing and the preparation of dedicated risk communication tools and bulletins (which feature a five-day hazard forecast).

Multi-hazard early warning systems strengthen DRR and resilience in Africa

The utility of these comprehensive early warning systems and their outputs are integral to the development of the response and coordination capacities of Member States, and building over time, their resilience to the impacts of natural hazards in Africa.

Introduction

Understanding the scale and distribution of hazards is critical for risk reduction

Africa has become increasingly exposed to frequent and intensified threats of hazards, such as floods, droughts, cyclones, earthquakes, landslides and conflicts which are causing increased disaster losses and mortalities affecting more than 460 million people as of 2016.[2] Over the last four decades (1970-2019), the continent has experienced more than 1000 disasters caused by natural hazards, resulting in one million deaths and significant economic losses costing several billions of US dollars.[3]

Disaster risk in Africa is multi-dimensional in nature. What this means is that the incidence and interactions between different types of hazards such as floods, droughts, cyclones, earthquakes, landslides and conflicts contribute to the overall risk profile of any given locality, country, region and entire continent. For instance, heavy rainfall events could trigger both hazards of localised flooding and landslides in areas that are prone to both, in a sequential, simultaneous or complex manner. The impacts of the catastrophic mudslide disaster that struck Freetown, Sierra Leone in August 2017 killing hundreds of people, as well as the dual shocks of tropical cyclones Idai and Kenneth, which struck within a six-week window in 2019 affecting over 10 countries in Eastern and Southern Africa were all typical of multi-hazard interactions of heavy rainfall, flooding, landslides causing displacement, ill-health and impoverishment of over one million people. The often compounded impacts of multiple interacting hazards also mean that any risk reduction and management action should ideally consider the likelihood of the impact of more than one hazard during planning and implementation. In that regard, there are two broad configurations in which multi-hazard approaches are classified: (i) independent multi-hazard approaches, where single hazards are just overlaid and treated as independent (often separate) phenomena, and (ii) approaches that consider multiple hazards and their potential interactions. Interrelated and often cascading hazards are the most prevalent in Africa, in occurrence and impact. For example, in Kampala (Uganda) and Zomba (Malawi),[4] both inland cities, frequent flash floods usually destroy backyard gardens, make roads impassable, accelerate contamination of water sources and contribute to the intensive spread of diseases like cholera and malaria. In August 2021, widespread flooding across all eight regions of Niger led to greater disaster losses and fatalities from the subsequent outbreak of cholera and collapsed buildings.

This multi-hazard focus on risk reduction also highlights the diversity of risk governance and the institutional arrangements that would be appropriate at any given scale. This is particularly important for Member States to streamline disaster risk reduction efforts from the continental level to national and subnational institutional arrangements. Considering the multi-dimensionality of disaster risk raises parallel considerations for the types of integrated and multi-sectoral responses (including the tools and initiatives) that will be appropriate and contextually relevant for AU Member States.

Hazards are dynamic and also occur with different intensities, at different times in nature due to factors such as both climate variability and climate change. As a result, the attempt to forecast hazards can range from seasonal, sub-seasonal and other short-term periods. The emphasis on early warning is to be able to progressively, with a degree of confidence capture appropriate length hazard forecasts that are useful and applicable to the local context. Furthermore, the intensity of hazards in themselves also occurs as a spectrum, ranging from smaller incidents to larger headline-making events. It is important in this regard for hazard forecasting to also progressively consider not just the distribution and occurrence of hazards but to provide an insight into the scale, and their corresponding degrees of potential impact as well as mitigation measures. Additionally, drawing on technology and analytical tools to be able to account for a breadth that does not only skew towards the large-scale, headline-making disaster events.

Apart from these different temporal and scale dimensions of hazard forecasts, the spatial dimension is also very important. The spectrum of disaster risks and hazards often have different spatial manifestations and occur across different geographies. It includes hazards that cross the traditional configuration of urban centres versus the periurban, the coastal versus the hillsides/inland, formally planned areas versus informal settlements, and even across national and regional boundaries. The responses to regional and cross-border hazards and disaster events in Africa require the commitment and prompt coordinated efforts of all Member States.

Early warning reduces vulnerability to the impacts of disasters:

A disaster causes losses only when vulnerable people and assets are exposed to it. Exposure and vulnerability are therefore key determinants in whether a hazard causes loss and whether people, communities and indeed entire countries and region are impacted. Because the ultimate goal and measure of the effectiveness of any disaster risk reduction activities are to reduce the losses and damage incurred, a reduction in exposure to a hazard is an effective step forward. The use of early warning systems plays a significant role as it provides critical information that can be acted upon in anticipating of disasters and amongst others may limit or avert exposure to the impact of the hazard. Early warning through its anticipatory nature is integral to the way Member States can prepare for and reduce the impact of disasters. Disaster risk must be viewed in the context of the society, country and other local contexts in which it occurs, and the value of early warning in this regard is to ensure that all vulnerable constituents are adequately informed to make the appropriate action. Early warning is therefore fundamental to disaster preparedness. It refers to strategies and measures for preparing for and reducing the impacts of disasters and encompass more than the generation of early warning information, to include complimentary actions of contingency planning and evacuation drills and more elaborate hazard forecast-based financing and insurance to pool financial resources together and allows for the access to rapid and predictable financing when disaster strikes to protect the food security and livelihoods of their vulnerable populations. This already forms part of the growing support the AU is providing to Members States through the core functions of its specialised Agency: the Africa Risk Capacity.[5]

Early warning that takes into account the diversity in spatial distribution and local manifestations of disaster risks allows for a deeper understanding of the cascading effects that disasters often set off. It also allows Member States to consider proposed strategies and action plans that are appropriate for their individual contexts.

H.E. Amb. Fathallah Sijilmassi, Director General, the African Union Commission (R) and H.E. Marina Sereni, Vice Minister, Foreign Affairs and International Cooperation, the Government of Italy (L), at the AMHEWAS handing over ceremony" (Photo Credit: African Union, 2022)

Multi-hazard early warning Situation Rooms will enhance early action in Africa:

A systemic approach to risk management is essential to ensure that policy options and corresponding actions are sustainable in the long term. For instance, this requires the generation and curation of risk information and data that is channelled through early warning systems. One of the recent concrete efforts that the AU has taken to support this ambition is the targeted investment in the establishment of Situation Rooms that concentrate and coordinate early warning systems at both the continental and regional scales to support Member States. The AU with the financial support of the Italian Government and technical support of CIMA Research Foundation and UNDRR has established the Africa Multi-Hazard Early Warning and Early Action System (AMHEWAS) programme to improve the availability, access and use of disaster risk information for early warning and action across the continent.[6] The AMHEWAS Situation Room is curated in a state-of-the-art and fully equipped continental Situation Room. The AMHEWAS performs round-the-clock monitoring of flood risk and draws on real-time satellite and climatic data to model risk. The temporal, spatial and anticipated intensity of the risk is further modelled and categorised into degrees of intensity using a simple-to-understand colour coding. Daily situation reports are prepared and disseminated to Member States and Regional Economic Communities (RECs). The availability of the Early Risk Information will allow RECs and members States to enhance preparedness and the coordination for early action, to mitigate the impact of disasters.

The AMHEWAS complements two other regional situation rooms; the Climate Prediction and Application Centre (ICPAC) located in Nairobi, Kenya, and the African Centre of Meteorological Applications for Development (ACMAD) in Niamey, Niger.

It is important to note that the AMHEWAS provides a comprehensive approach to disaster preparedness and advances early action of Member States and thereby bridging the warning-action gap through a number of distinct means:

Enhancing Risk knowledge

It builds the baseline understanding of risks (hazards and vulnerabilities) and priorities at a given level, including the careful curation of longitudinal data beginning with the current focus on flood risk.

Monitoring

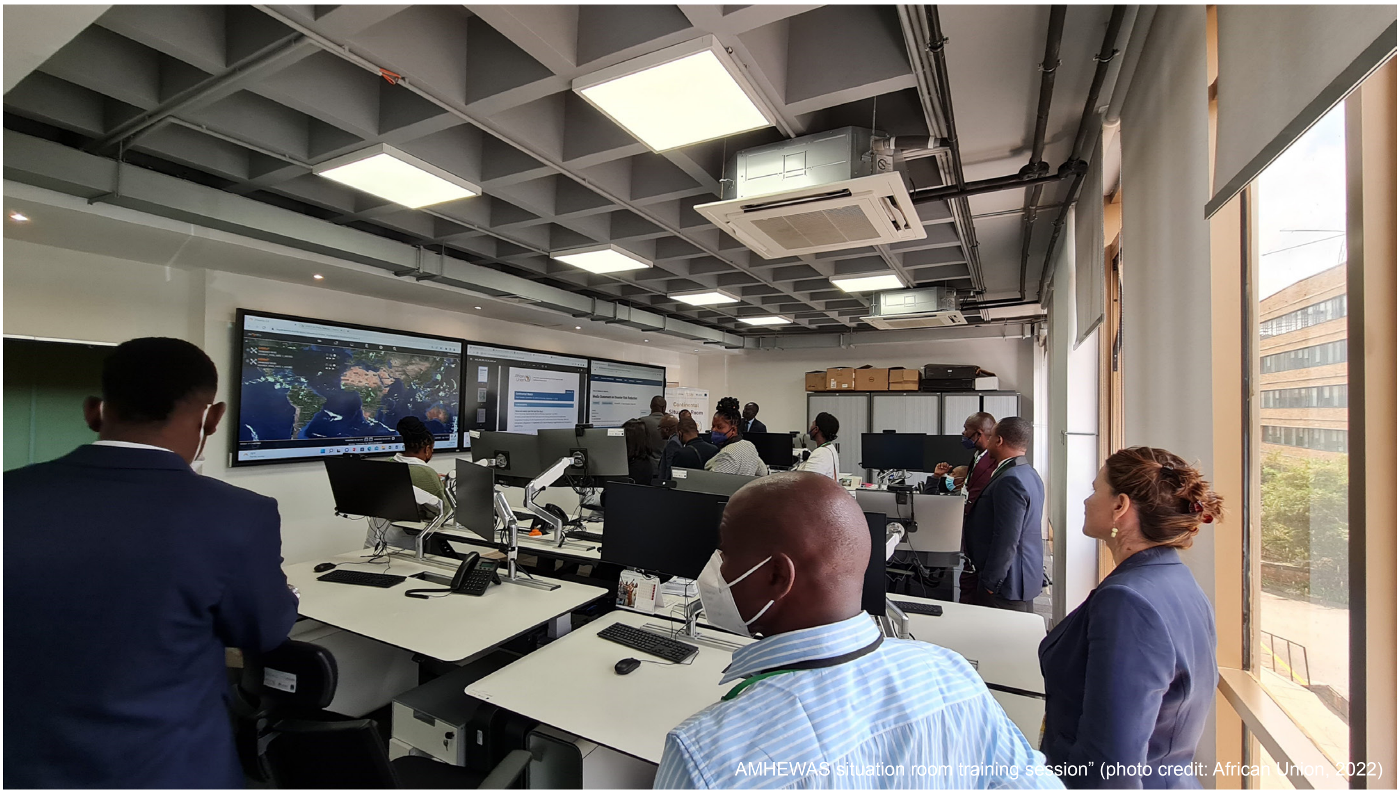
Systematic and dedicated follow-up of hazard activity on the continent and how those risks and vulnerabilities change through time. The AUC's DRR Unit in the Division for Agriculture, Rural Development, Blue Economy & Sustainable Environment (DARBE) has a dedicated team assigned to this function.

Enhanced response capability

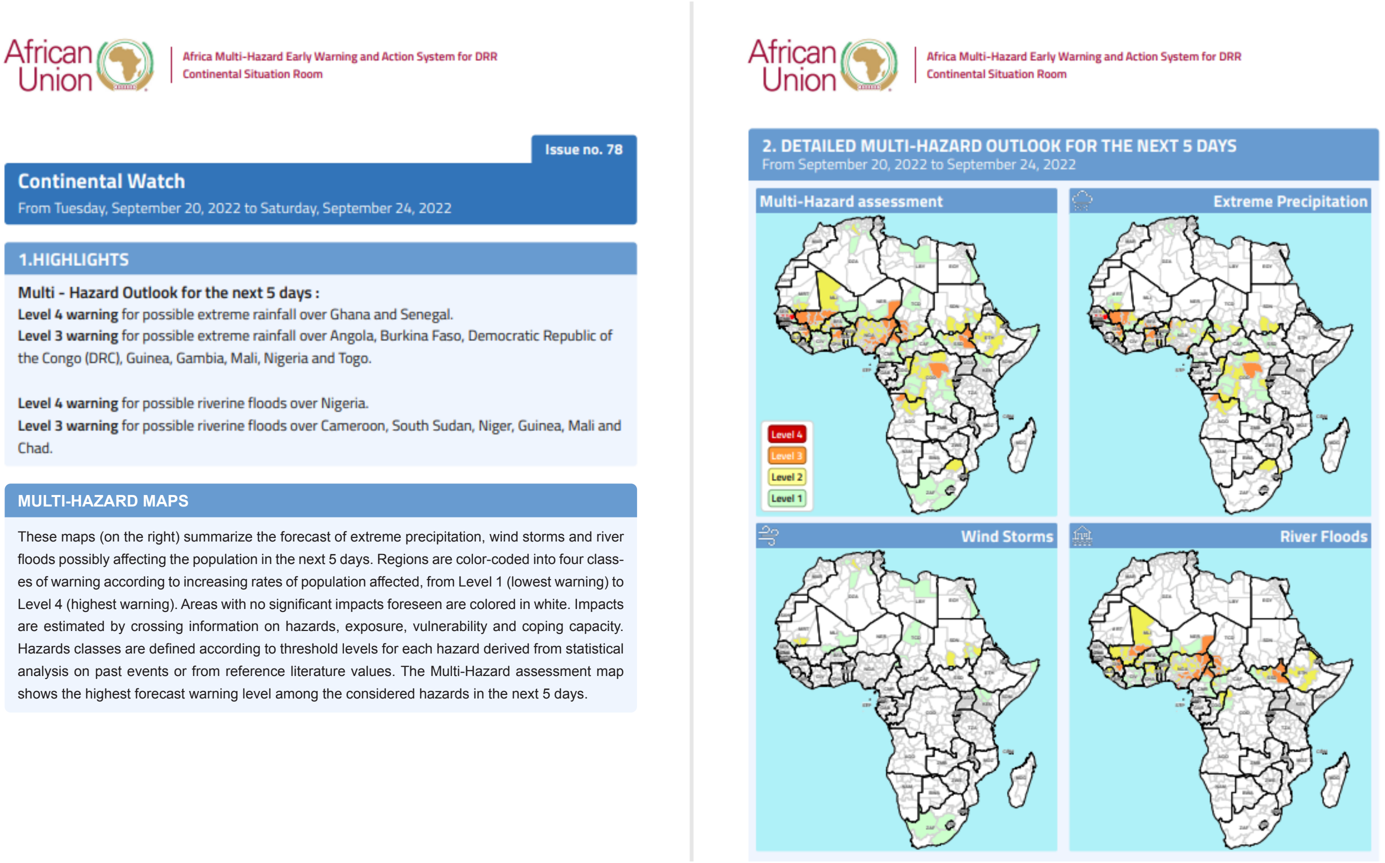
Providing regularly updated risk information to Member States gives a lead-time and the impetus for a range of mitigation activities including support measure as evacuations in anticipation of extreme events.

Warning communication

The preparation of concise, tangible and actionable messages, which are easy to understand, including visualised graphics and maps, has expanded the range of risk communication directly available to Member States.



AMHEWAS situation room training session" (photo credit: African Union, 2022)



Africa Multi-Hazard Early Warning and Action System for DRR
Continental Situation Room

Issue no. 78

Continental Watch

From Tuesday, September 20, 2022 to Saturday, September 24, 2022

1.HIGHLIGHTS

Multi - Hazard Outlook for the next 5 days :
Level 4 warning for possible extreme rainfall over Ghana and Senegal.
Level 3 warning for possible extreme rainfall over Angola, Burkina Faso, Democratic Republic of the Congo (DRC), Guinea, Gambia, Mali, Nigeria and Togo.

Level 4 warning for possible riverine floods over Nigeria.
Level 3 warning for possible riverine floods over Cameroon, South Sudan, Niger, Guinea, Mali and Chad.

MULTI-HAZARD MAPS

These maps (on the right) summarize the forecast of extreme precipitation, wind storms and river floods possibly affecting the population in the next 5 days. Regions are color-coded into four classes of warning according to increasing rates of population affected, from Level 1 (lowest warning) to Level 4 (highest warning). Areas with no significant impacts foreseen are colored in white. Impacts are estimated by crossing information on hazards, exposure, vulnerability and coping capacity. Hazards classes are defined according to threshold levels for each hazard derived from statistical analysis on past events or from reference literature values. The Multi-Hazard assessment map shows the highest forecast warning level among the considered hazards in the next 5 days.

Africa Multi-Hazard Early Warning and Action System for DRR
Continental Situation Room

2. DETAILED MULTI-HAZARD OUTLOOK FOR THE NEXT 5 DAYS

From September 20, 2022 to September 24, 2022

Extract from the Continental Watch Report (Photo Credit: African Union, 2022)

Conclusion

Early warning is critical to building resilience in Africa

The planned progression in both the expanded focus of the AMHEWAS is to capture other hazards, like droughts and maximise its projection and risk profiling through the analysis of data gathered. The utility of these comprehensive systems and their outputs are integral to the development of the response and coordination capacities of Member States, and building over time, their resilience to the impacts of natural hazards in Africa. Early warning coupled with early action is fundamental to resilience-building, both in-country and across wider regions. The next phase of the AMHEWAS Programme aims to develop the legal and institutional frameworks and the operational capacities that will support efficient data collection, analysis and dissemination from the continental to the local levels. The efficiency of the programme also requires the ongoing support and commitment of all Regional Economic Communities and Member States to ensure interoperability of the different Situation Rooms at both vertical and horizontal levels to enhance proactive risk management and response to disaster risks on the continent.

Notes and Further readings

1 World Bank (2016) ‘Striving Toward Disaster Resilient Development in Sub-Saharan Africa’ https://documents1.worldbank.org/curated/en/399341477983384347/pdf/109561-WP-AFRDRMENGStrategicFrameworkweb-PUBLIC.pdf

2 See note “1” above

3 See further a recent continental report that captures the state and impact of disasters in Africa; AU (2019) “Africa Biennial Report on Disaster Risk Reduction 2015-2018”. https://au.int/en/documents/20200805/first-africa-biennial-report-disaster-risk-reduction-synopsis-report.

4 Lwasa, S., Buyana, K, Kasaija, P. and Mutyaba, J. (2018) “Scenarios for adaptation and mitigation in urban Africa under 1.5 °C global warming”, Current Opinion in Environmental Sustainability 30:52-58

5 Read further on the work of the Africa Risk Capacity: https://www.arc.int/

6 The AMHEWAS was commissioned in March 2022. See news bulletin https://www.undrr.org/news/italy-and-partners-handover-situation-room-african-union-commission

Disclaimer

Acknowledgements

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