African Union

Institutional Framework

INSTITUTIONAL AND OPERATIONAL FRAMEWORK FOR MULTI-HAZARD EARLY WARNING AND EARLY ACTION SYSTEM FOR AFRICA

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AGENZIA ITALIANA
PER LA COOPERAZIONE
ALLO SVILUPPO

Foreword

Rising disasters require agile and inter-operational early warning systems. In just four years (2015-2018), Africa recorded more than seven hundred (700) disaster events which affected over eighty (80) million people either directly or indirectly. These disasters were mostly caused by hydro-meteorological or climatological hazards and the risks to their occurrence were also multi-faceted in nature. Sadly, in this same period over 66,000 died as a result of these disasters. The damage to property and lives affected or lost could have been substantially reduced or averted if early warning systems (EWS) were adequate.

The African Union Commission (AUC) and the African Union's Member States developed a Programme of Action (PoA) for the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 in Africa to prevent new and reduce existing disaster risks. Both the Sendai Framework and the PoA aim to substantially increase the availability of and access to Multi-Hazard Early Warning Systems and disaster risk information and assessments to people by 2030.

As climate related disasters are on the rise, the need to develop Multi-Hazard Early Warning Systems to respond to the increase in frequency and magnitude of climate hazards is not only urgent but essential. The establishment of Multi-Hazard Early Warning Systems on the continent would ensure keeping people out of poverty and protection of development, including attainment of the goals enunciated in the AUC Agenda 2063: The Africa We Want.

To rise to this challenge, the AUC has developed the Africa's Framework for Multi-Hazard Early Warning and Early Action System. This Framework sets out mechanisms, structures and operational directives for coordination of specialised departments of the African Union Commission (AUC), Regional Economic Communities (RECs), and Member States (MS). An effective coordination of the early actions amongst the relevant agencies are what will ensure that exposures are reduced, resilience are built and the last mile connectivity is reached.

Delivery of an effective and end to end multi-hazard early warning system is a step-by-step process towards a long-term vision; it will take the consistent and holistic commitment of AUC, RECs, MSs and development partners. Essentially, this would translate into a significant number of MS with risk-informed preparedness plans that are periodically tested, as well as, networked response, and 'Build Back Better' strategies that are standard but contextually relevant.

I take this opportunity to acknowledge and thank some of our esteemed development partners for the support that they rendered to us in the development of this framework. The generous financial

support from the Government of Italy, Government of Sweden and technical support by the United Nations Development Programme and the United Nations Office for Disaster Risk Reduction contributed immensely to the development of the framework, which gave rise to the Africa Multi-Hazard Early Warning and Early Action System (AMHEWAS) Programme.

This AUC further wishes to invite these cherished partners well as other interested development and technical partners to continue to support our efforts in the implementation of the AMHEWAS Programme.

Amb. Josefa Leonel Correia Sacko

Commissioner Agriculture, Rural Development, Blue Economy and Sustainable Environment

African Union Commission

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List of Abbreviations and Acronyms

AAR	After-Action Review
Africa CDC	Africa Centre for Disease Control and Prevention
ACMAD	African Centre of Meteorological Applications for Development
AMHEWAS	Africa Multi-Hazard Early Warning and Early Action System
ARSDRR	Africa Regional Strategy for Disaster Risk Reduction
AU	African Union
AUC	Africa Union Commission
AUC-DARBE	African Union Commission's Department of Agriculture, Rural Development, Blue Economy and Sustainable Environment
CAP	Common Alerting Protocol
CEWS	Continental Early Warning System
CIMA Research Foundation	Centro Internazionale in Monitoraggio Ambientale Fondazione
COVID-19	Coronavirus disease (SARS-CoV-2 virus)
CREWS	Climate Risk and Early Warning System
CW	Continental Watch
DMA	Disaster Management Agency
DMIS	Disaster Management Information System
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EOC	Emergency Operations Centre
EU	European Union
EWS	Early Warning System
EW-TWG	Early Warning Technical Working Group
GFDRR	Global Facility for Disaster Reduction and Recovery
HARDP	Humanitarian Affairs, Refugees, and Internally Displaced Persons
HFA	Hyogo Framework for Action
HHS	Health, Humanitarian Affairs and Social Development
IBF	Impact-Based Forecast
ICT	Information and Communication Technology
ICPAC	IGAD Climate Prediction and Applications Centre
IDP	Internally Displaced Person
MDA	Ministry, Department, and Agency
MHEWS	Multi-Hazard Early Warning System
MHEWAS	Multi-Hazard Early Warning and Early Action System
MS	Member State (of the African Union)
NDMA	National Disaster Management Agency
NFP	National Focal Point
NGO	Non-Governmental Organization
NGU	National Geological/Geophysical Unit

NHS	National Hydrological Service
NMHS	National Meteorological and Hydrological Service
NMM	National Meteorological Service
NWS	National Weather Service
PMC	Programme Management Coordinator
PoA	Programme of Action
PSC	Peace and Security Council
RCC	Regional Climate Centre
RDCC	Regional Disaster Coordination Centre
REC	Regional Economic Community
RSS	RDF Site Summary/Really Simple Syndication
SDG	Sustainable Development Goal
SOP	Standard Operating Procedure
TWG	Technical Working Group
UNDP	United Nations Development Programme
UN	United Nations
UNDRR	United Nations Office for Disaster Risk Reduction
WMO	World Meteorological Organization
WCDRR	World Conference for Disaster Risk Reduction

A Guide to Common Key Terms and Concepts used in AMHEWAS Development

Cascading Disasters : 'Cascade of events' is a series of adverse events generated by single or different sources. 'Cascading events' are unforeseen chains of dependent phenomena due to an originating event (triggering hazard). Cascading disasters are extreme events, in which cascading effects increase in progression over time and generate unexpected secondary events of strong impact.

Disaster Risk Management (DRM) : The application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses.

Disaster Risk Reduction (DRR) : Disaster Risk Reduction is the policy objective of the disaster risk management and therefore aims to the achievement of sustainable development.

Early Action : Involves taking steps to protect people, with meaningful engagement with at-risk communities, before a disaster strike, based on early warning or forecasts. It is also known as, anticipatory action or forecast-based action.

Early Warning System (EWS) : An integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses, and others to take timely action to reduce disaster risks in advance of hazardous events.

Emergency Management Cycle : is a multiphase framework that helps communities prepare for, respond to, and recover from a disaster. It also establishes a process for continuous readiness and improvement. The cycle consists of the following four phases: mitigation, preparedness, response, and recovery.

Emergency Preparedness and Response : It includes those aspects of DRM focused on the development of structures, capabilities and capacities of government agencies, communities, and others to respond to an emergency, resolve the immediate challenges, and initiate early recovery. This includes emergency preparations such as risk assessment, communication and planning, and capacity building including training, exercising and development of Early Warning Systems.

Forecasting : The application of science and technology to predict the state of the atmosphere for a given location on a variety of timescales. Forecasts are often referred to as 'nowcasts' (from zero to six hours), very-short-range weather forecasts (up to 12 hours), short-range weather forecasts (from 12 to 72 hours), medium-range weather forecasts (from three to 10 days), extended-range weather forecasts (from 10 to 30 days), and long-range forecasts (from 30 days to two years). There are also monthly, trimonthly, and seasonal outlooks (covering, for example, December to February, March to May, June to August, or September to November) and longer-term climate predictions (from years to centuries).

Hydrology : The scientific study of the Earth's water system.

Hydrometeorology : A branch of meteorology and hydrology that studies the transfer of water and energy between the land surface and the lower atmosphere. Hydrometeorological hazards are caused by extreme meteorological and climate events, such as floods, droughts, hurricanes, tornadoes, landslides, or mudslides.

Hydrometeorological Services : Also, known as hydromet services, are high-quality weather, climate, hydrological, and related environmental services that provide the foundation for effective climate adaptation and resilience action.

Hyogo Framework for Action (HFA) : The 'Hyogo Framework for Action (HFA) 2005-2015' was a global blueprint for disaster risk reduction efforts with a ten-year plan, adopted in January 2005 by168 Member States of the United Nations at the World Conference on Disaster Reduction.

Impact-Based Forecasts (IBF) and Warnings : Forecasts and warnings designed to express the expected impacts as a result of the expected weather. They require information on the hazard and the vulnerability of those affected.

Meteorology : The scientific study of the Earth's atmosphere as it relates to short-term weather and long-term climate variations.

Meteorological and Hydrological Hazards : Flash floods, river floods, thunderstorms, tropical cyclones, and other extreme weather-related events, as well as slow-onset hazards, such as droughts.

Multi-Hazard Early Warning Systems (MHEWS) : Address several hazards and/or impacts of similar or different type in contexts where hazardous events may occur alone, simultaneously, cascading or cumulatively over time, and taking into account the potential interrelated effects. A multi-hazard early warning system with the ability to warn of one or more hazards increases the efficiency and consistency of warnings through coordinated and compatible mechanisms and capacities, involving multiple disciplines for updated and accurate hazards identification and monitoring for multiple hazards. The acronym MHEWAS refers to the multi-hazard early warning and early action system, and AMHEWAS refers to the Africa multi-hazard early warning and early action system.

National Meteorological and Hydrological Services (NMHSs) : NMHS is an abbreviation that encompasses both National Meteorological Services (NMSs) and National Hydrological Services (NHSs). The abbreviation NMHS also refers to a national hydrometeorological service (if hydrology and meteorology are combined in a single institution).

Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) : The Sendai Framework for Disaster Risk Reduction 2015-2030 outlines seven clear targets and four priorities for action to prevent new and reduce existing disaster risks. It aims to achieve the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries over the 15 years. The Framework was adopted at the Third UN World Conference on Disaster Risk Reduction in Sendai, Japan, on March 18, 2015.

Strategic Plan : A document that articulates the decisions made about an organization and the organization's goals and the ways it will achieve those goals.

The Framework : The Framework provides guidance to continental, regional and national stakeholders on the critical operational and institutional aspects for the establishment of multi-agency and multi-sectoral coordination structures as well as data exchange and communication infrastructure with streamlined processes, protocols, tools and expertise, for accurate, timely and accessible early warning information, followed by early action at the Member State, regional and continental level. The operationalization of this framework will ensure that all those required to act in response to an Early Warning have access to the right information, at the right time, and in the most appropriate format, thus helping to prevent and mitigate disaster impacts based on accurate forecasts.

The Operational Model : The AMHEWAS Institutional and Operational Framework sets out a vision and an indicative operational model for the long-term development of the Africa-wide multi-hazard early warning and early action system. This requires the development of formalised structures to coordinate Early Warning System development across all Member States (MSs) and Regional Economic Communities (RECs) of the African Union. The suggested AMHEWAS Operational Model endeavors to ensure that early warning information and advisories can be issued to all stakeholders who have a direct interest in receiving such information for timely decision-making and initiating effective early actions. The operational model includes guidance for the African Union Commission, the Regional Economic Communities, and the Member States, including key considerations for both near-term priorities and future work of the AMHEWAS.

An indicative operational model for consideration is set out in Chapter 4.

The Programme : For the purposes of this report, is the seven-year Programme to deliver the AMHEWAS Framework to enhance and further develop existing warning systems and further refine the long-term MHEWAS model before its full implementation. This multi-year Programme will be delivered in three distinct stages set out over seven years. The Programme is designed to allow and accommodate necessary stakeholder engagement on key decisions, as well as establishing supporting structures at Member States, RECs and continental levels.

While the Programme is set out to meet the AU's commitment to delivery of MHEWAS by 2030, it includes annual reviews by decision-makers so that if circumstances permit, parts of the Programme can be accelerated and delivered more quickly. The AMHEWAS Programme is also called the Continental MHEWAS Programme or the Development Programme.

The Delivery Plan : An outline plan setting out a tentative timetable for the delivery of the seven-year AMHEWAS Programme is called the Delivery Plan. For the different Programme stages, it provides an index of activities and target years, associated list of indicators along with the responsible parties and an estimate of a budget for the different activities. The illustrative budget estimates, provided for all activities, are based on an indicative set of assumptions and cost. The indicative plan was established to enable the AUC to meet its current commitment to deliver AMHEWAS by 2030 and has been detailed in Annexure 3.

The Situation Room : A facility at national, regional, or continental level where risk and hazard data are analysed to produce impact-based forecasts and issue early warning advisories and

alerts, thus driving early action. Depending upon need, or following historical precedent, situation rooms could be set up for single or multiple hazards. Once anticipatory or preparedness actions for a major disaster are underway, situation rooms may continue to provide data, information, and analysis to inform decision-makers operating in other situation rooms or coordination centres or emergency operation centres.

The AMHEWAS Situation Room, as it is currently set up, is a facility in Addis Ababa that works closely with the situation rooms in two regional climate centres: the African Centre of Meteorological Application for Development (ACMAD) in Niamey, Niger; and the IGAD Climate Prediction and Applications Centre (ICPAC) in Nairobi, Kenya.

These three situation rooms, which are part of the larger African network – at different stages of development – provide information and analysis to decision-makers through emails and meetings, direct resources, or manage disaster response and long-term recovery operations.

Executive Summary

The African Union Commission Executive Council at its 30th session, January 2015 [EX.CL/Dec.943 (XXX)], endorsed the Programme of Action (PoA) for the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 in Africa, and the Mauritius Declaration on the Implementation of the Sendai Framework in Africa. The PoA targets to "substantially increase the availability of and access to multi-hazard early warning systems, assessment and disaster risk information and assessments to people by 2030."

Africa Institutional and Operational Framework for Multi-Hazard Early Warning and Early Action System (AMHEWAS) sets out the development programme and indicative delivery plan for delivery of these commitments and proposes governance structures for a multi-year programme for the development of AMHEWAS that contributes to, as far as possible, reducing exposure to hazards and helping to prevent the many small emergencies from developing into full- fledged disasters.

Disasters events are increasing year-on-year and remain a continuing challenge for many African states, making the continent the most vulnerable on earth. The impact of disasters in terms of lives lost and economic losses is also significantly increasing. This proposed AMHEWAS Framework comes at a time when the continent is experiencing increasing occurrences of disasters associated with climate and weather-related phenomenon.

Early warnings that facilitate effective early action can start to tackle these dangerous trends – saving lives and livelihoods, protecting development gains and the environment. However, warning systems are only as effective as the early actions they trigger. If warnings don't reach those that need to act, or if those receiving a warning don't know what to do when a warning is issued, the entire warning system fails. Conversely, timely and effective early warning enables communities and responders to activate their preparedness plans, for example, evacuating vulnerable people to shelters, or urging early harvesting to protect livelihoods and food security. Disasters do not respect jurisdictional boundaries. Increasingly, disaster events are having a larger footprint and thus increased transboundary impacts. If these dangerous trends are to be addressed, effective coordination on early warning is required between Member States, Regional Economic Communities, and at the continental level.

In recent years, many individual Member States, with support from continental and regional bodies and international partners, have made significant advances in early warning provision for specific hazards such as flood and drought. However, the 2015 Sendai Framework pointed out that increasingly disaster events were expected to cascadingly, simultaneously, or cumulatively over time. Hence, Early Warning Systems need to take account of the potential interrelated effects arising from hazard events.

The Sendai Framework urged a paradigm shift in how risk information is developed, assessed, and utilised in Multi-Hazard Early Warning Systems, disaster risk reduction strategies and government policies. The Sendai Framework asserts that to reduce disaster risk there is a need to address existing challenges and prepare for

future ones by focusing on monitoring, assessing, and understanding disaster risk. It emphasises the sharing of such information and how it is created, strengthening disaster risk governance and coordination across relevant institutions and sectors, and encourages full and meaningful participation of relevant stakeholders at appropriate levels.

International guidance on Early Warning System development was updated in 2017 by the International Network for Multi-Hazard Early Warning Systems (IN-MHEWS). The revisions acknowledged the Sendai Framework and incorporated the recognised benefits of Multi-Hazard Early Warnings Systems, disaster risk information, and enhanced risk assessments. The 2017 MHEWS Checklist identifies four essential elements of any Early Warning System that when congruous ensure effective warning for early action to be taken. These are:

1. Risk knowledge
2. Monitoring and warning service
3. Warning dissemination and communication
4. Preparedness and response capability

All warning systems are required to have these same four elements. While the technical arrangements for hazard monitoring will differ for each hazard type, there are significant opportunities for data sharing, collaboration, and partnerships in the delivery of remaining components across jurisdictional boundaries.

Partnerships on MHEWS delivery across sectoral and jurisdictional boundaries can help to reduce duplication of effort, reduce the cost of warning system provision, and deliver more reliable warnings that take full account of the cascading effects of a disaster.

Cognisant of the fact that issuing of early warning is a primary responsibility of Member States, the AUC, and RECs, initiated the development of this Framework with the aim to provide operational guidance on multi-agency and multi-sector coordination and communications structures at the Member States, regional and continental levels. The proposed Framework aims to provide for better exchange of data and information among each of those levels. Thus ensuring that all those required to act in response to an early warning have access to the right information, at the right time, and in the most appropriate format. This will facilitate better and timely decisions and actions thus helping to prevent and mitigate severe disaster situations based on accurate forecasts.

Early Warning Systems, even for a single hazard such as flooding, are complex and require close coordination between multiple partners to ensure an effective response. Development of warning systems for multiple hazards ensure the effective exchange of data and information across jurisdictional boundaries, adds yet further layers of complexity. In order to address this complexity, the Framework to implement a Africa Multi-Hazard Early Warning and Early Action System AMHEWAS sets out both an indicative plan for a continental system's delivery, and a seven-year programme to enhance and further develop existing warning systems and further refine that long-term AMHEWAS model before its full implementation. This approach will support immediate improvements in existing warning system provision as well as provide a way forward for continental partners to work toward delivery of the AU's commitment for the establishment of AMHEWAS by 2030.

This multi-year Programme will be delivered in three distinct stages set out over seven years.

It is designed to allow and accommodate necessary discussion and encourage stakeholder engagement on key decisions as well as establishing supporting structures at MSs, RECs and continental levels. While the Programme is set out to meet the AU's commitment to delivery of AMHEWAS by 2030, it includes annual reviews by decision makers so that if circumstances permit, parts of the Programme can be accelerated and delivered more quickly.

The proposed AMHEWAS Programme is discussed in detail in Chapter 3 (and Annexure 2), and an overview of the three stages is presented below.

Stage 1 Start Up Phase (2 years)

With the objective to guide the Africa Multi-Hazard Early Warning and Early Action System (AMHEWAS, also called, the continental MHEWAS or the Africa MHEWAS in this report) development, this phase shall commence with establishment of decision-making and Technical Working Groups (TWGs) at MSs, RECs, and continental levels.

In years 1 and 2, the priority will be to raise awareness among and sensitise decision makers and to start work on supporting capacity building for existing sectoral Early Warning Systems. The capacity building efforts will concentrate on enhancing the natural hazard systems as a first step toward AMHEWAS delivery.

The AMHEWAS Situation Room will assist in coordinating the exchange of early warning data and information. In the first two years, it is proposed that the Programme should have a light management structure as most activities will be related to sensitising decision makers and building of partnerships at national, regiona, and continental levels.

The AUC will play the role of overall Programme Management Coordinator (PMC) based on annual work plans. At least four consultation meetings per year will be organised to: a) exchange approaches and adapt interventions to avoid overlap, b) ensure that there is no duplication, and c) that the Programme achieves the results planned in the work plan document.

Expected outputs

- Institutional architecture for the continental MHEWAS programme is fully established
- Technical Working Groups and information exchange mechanisms are established, and clarification of roles and responsibilities provided, based on guidance from this Framework
- Projects for further development of specific early warning capabilities are developed and implemented

Stage 2 MHEWAS Development Phase (3 years)

This stage includes continued development and capacity building for sectoral warning systems, and review and revision of proposals for long-term AMHEWAS coordination structures in light of lessons learned during Stage 1. The revised proposals for long-term delivery of AMHEWAS will be submitted to the decision makers for endorsement at the conclusion of Stage 2 and prior to commencing work on Stage 3.

Expected outputs

- Technical Working Groups to guide the establishment of the AMHEWAS Situation Room and creation of regional situation rooms

- Standard Operating Procedures (SOPs), protocols for data exchange, recommendations for procurement of systems and equipment for the different situation rooms
- Technical Working Groups considered and analysed appropriate long-term AMHEWAS governance and budgetary arrangements and made proposals to decision makers

Stage 3 MHEWAS Piloting and Delivery (2 years)

This stage may involve the adoption of supporting legal and institutional arrangements as necessary, the development of SOPs and operational plans, and piloting the continental warning system, commencing with at least one REC and two MSs with AUC providing coordination.

At the conclusion of the AMHEWAS Programme, an evaluation of the progress will be undertaken, and proposals submitted for agreement of the decision makers on permanent arrangements for maintenance of the AMHEWAS beyond the initial seven-year period of the Development Programme.

Expected outputs

- Piloting and evaluation of the continental MHEWAS with overall coordination of AUC
- Development of proposals for the permanent establishment of the AMHEWAS, including an ongoing and long-term Programme to upscale the continental system

Preamble

This Framework for the Africa Multi-Hazard Early Warning and Early Action System (AMHEWAS) has been produced in response to previous decisions and commitments of the African Union. It sets out the mechanisms, structures and operational directives for coordination and integration of organs and technical specialised offices of the African Union Commission, Regional Economic Communities, and Member States in order to deliver a continental Multi-Hazard Early Warning and Early Action System. Key decisions and commitments of the African Union supporting this Framework include:

i. The Protocol relating to the establishment of the Peace and Security Council (PSC) and the African Peace and Security Architecture (APSA), in particular (Article 6 (b), (e), (f), Article 12 (4), Article 13 (3) (f) and Article 15), which emphasize early warning, prevention, humanitarian action and disaster management to alleviate the suffering of displaced persons, reconstruction and development of affected areas; and the role of African Standby Force (ASF) in supporting civilian population in conflict areas and disaster situations.

ii. The Assembly Decision [Assembly/AU/Dec.417(XIX)] of 16 July 2012, which endorsed the establishment of the African Risk Capacity as a Specialised Agency of the African Union and accorded the privileges and immunities specified in the OAUC General Convention on Privileges and Immunities; convinced that the establishment of an African Risk Capacity under the leadership of the African Risk Capacity Agency will provide an improved sovereign risk management instrument that will allow African Union Member States to pool resources to provide rapid and efficient emergency financing when faced with extreme weather events in a manner that is complementary to the development of other risk management mechanisms for enterprises and households, improve African Union Member States' access to predictable, regionally-managed funding for emergencies, and facilitate contingency planning for such events;

iii. The Executive Council Decision [EX.CL/Dec.858 (XXVI)] of January 2015 requesting the African Union Commission to facilitate the review of the Extended POA for the implementation of the ARSDRR in line with the post-2015 framework for disaster risk reduction. This call was also reiterated in the 23 July 2016 Yaounde Declaration on the Implementation of the Sendai Framework in Africa (Clause 32).

iv. The African Union Commission Executive Council at its 30th session, January 2015 [EX.CL/Dec.943 (XXX)], endorsed the Programme of Action (PoA) for the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 in Africa, and the Mauritius Declaration on the Implementation of the Sendai Framework in Africa.

The PoA targets to "substantially increase the availability of and access to multi-hazard early warning systems, assessment and disaster risk information and assessments to people

by 2030." Establishment of effective Early Warning Systems has been a goal of the African Union Commission since adoption of the Programme of Action for the Implementation of the Africa Regional Strategy for Disaster Risk Reduction (2006-2015) developed in 2005, and subsequently from 2011 through the Extended Programme of Action (POA) for the Implementation of the ARSDRR. Given that the timeframe for the Extended POA of the ARSDRR was up to 2015, this alignment required fashioning an action plan on the SFDRR for implementation in Africa. The AU Heads of State and Government have expressed their commitment to the implementation of the SFDRR as a means of sustaining the momentum generated by the Extended Programme of Action (POA). It is noteworthy that the Africa Regional Strategy (2004) was developed before the Hyogo Framework for Action (HFA) was adopted as the global framework on disaster risk reduction. The Sendai Framework for Disaster Risk Reduction 2015-2030 provides the opportunity to focus disaster risk management (DRM) on implementation of the new global framework for disaster risk reduction (DRR) in Africa, based on a revised Programme for Action (POA) that strengthens efforts to increase resilience which will drive poverty reduction, sustainable development in line with the Sustainable Development Goals (SDGs), the Agenda 2063 and other development frameworks and processes.

v. The Assembly Decision [Assembly/AU/Dec.554 (XXIV)] adopted at the 24th Ordinary Session of the Assembly held in Addis Ababa, Ethiopia in January 2015, in which the Assembly endorsed the establishment of the Africa Centre for Disease Control and Prevention and approved that the Coordination Office should initially be located at the Headquarters of the African Union Commission in Addis Ababa, Ethiopia.

vi. The Assembly Decision [Assembly/AU/Dec.604 (XXVI)] on the implementation of Agenda 2063, adopted on 31 January 2016, in Addis Ababa, Ethiopia, especially Aspiration 3 regarding Africa of good governance, democracy, respect for human rights, justice and the rule of law and Aspiration 4 on peaceful and secure Africa.

vii. The African Union Executive Council Decision [EX.CL/Dec.943(XXX)] at its 28th session held in January 2017 endorsed the Programme of Action (PoA) for the Implementation of Sendai Framework for Disaster Risk Reduction 2015-2030. One of the targets of the PoA is to "substantially increase the availability of and access to operational multi-hazard sub-national, national, and regional early warning systems, assessment, and information by 2030."

viii. The African Union Executive Council Decision [EX.CL/Dec.1076(XXXVI)] at its 36th ordinary session, 06–07 February 2020 in Addis Ababa, Ethiopia, made the following decisions in respect of early warning and prevention: UNDERTAKE measures to strengthen national systems on disaster-related displacement, disaster risk and reduction and early warning in line with the Sendai Framework, the African Regional Strategy for Disaster Risk Reduction, and the Programme of Action for the Implementation of the Sendai Framework for the Disaster Risk Reduction 2015-2030 in Africa; PUT IN PLACE sustainable mechanisms aimed at mitigating the adverse

effects of environmental degradation, extreme weather patterns and climate change; ENSURE that early warning mechanisms of the African Union, RECs and Member States include early signs of disasters to facilitate early response and recovery; UNDERTAKE measures tostrengthen national systems on disaster-related displacement, disaster risk and reduction and early warning in line with the Sendai Framework, the African Regional Strategy for Disaster Risk Reduction, and the Programme of Action for the Implementation of the Sendai Framework for the Disaster Risk Reduction 2015–2030 in Africa; PUT IN PLACE sustainable mechanisms aimed at mitigating the adverse effects of environmental degradation, extreme weather pattern and climate change;

ENSURE that early warning mechanisms of the AU, RECs and Member States include early signs of disasters to facilitate early response and recovery.

ix. The Assembly Decision [Assembly/AU/Dec.1(XXXIII)] at its 33-ordinary session, 09–10 February 2020 Addis Ababa, Ethiopia encouraged Member States to take measures to strengthen their national systems on disaster-related displacement, disaster risk and reduction and early warning in line with the Sendai Framework, the African Regional Strategy for Disaster Risk Reduction. and the Programme of Action (PoA) for the Implementation of the Sendai Framework for Disaster Risk Reduction in Africa in 2015–2030.

Chapter 1 | Introduction and Overview

1.1 Introduction

The adverse impacts of natural hazard disasters, often driven by extreme weather events and impacted by climate change, present a severe threat to life and livelihoods, and hold back growth and development. The number of natural hazard disaster events and the resultant economic and humanitarian losses have been increasing steadily since the 1980s. The recent coronavirus disease 2019 (COVID-19) pandemic, a disaster that combined a biological threat with various vulnerabilities of economic and humanitarian losses, provided further evidence for the need to coordinate hazard and early warning information at the continental, regional, and Member States levels.

Even the most advanced and effective emergency response and post-disaster recovery efforts cannot address these growing losses and impacts. Disaster risk reduction depends on the ability of governments and citizens to take effective early action. Early action is expected to, as far as possible, reduce exposure to hazards and help prevent the many small emergencies from developing into full-fledged disasters. However, effective early action depends on a timely early warning, which would for example allow responders to prepare and deploy in advance, evacuate vulnerable people, or urge and encourage early harvesting to protect livelihoods and aid food security.

It is the responsibility of the African Union Commission (AUC) to ensure the creation of a homogeneous and uniform AMHEWAS in compliance with the Constitutive Act of the African Union, Rules of Procedure of the Assembly and the Executive Council, and the decisions of the Assembly and Executive Council. The Africa Regional Strategy for Disaster Risk Reduction (ARSDRR) was adopted by African Union (AU) Heads of State and Government in 2004.
The key ARSDRR objectives are listed below.

1. Increase political commitment to disaster risk reduction
2. Improve identification and assessment of disaster risks
3. Enhance knowledge management for disaster risk reduction
4. Increase public awareness of disaster risk reduction
5. Improve governance of disaster risk reduction institutions
6. Integrate of disaster risk reduction in emergency response management

The ARSDRR identified that the practice of risk identification was limited in Africa and that although there were sub-regional Early Warning Systems (covering food security, drought, and in some areas climatic factors), these were not widespread. The ARSDRR gave impetus to improve identification and assessment of disaster risks, including:

1. Improve the quality of information and data on disaster risks
2. Improve identification, assessment, monitoring of hazards, vulnerabilities, and capacities

3. Strengthen Early Warning Systems, institutions, capacities, and resource base, including observational and research sub-systems
4. Improve communication and information exchange among stakeholders in risk identification and assessment
5. Engender and improve integration and coordination of risk identification and assessment processes and interventions

The implementation of the Africa Regional Strategy was through the Programme of Action for the Implementation of the ARSDRR (2006-2015) developed in 2005. The PoA was aligned with the Hyogo Framework for Action (HFA) 2005-2015.

The Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) succeeded the HFA and was adopted by 187 Member States at the 3rd UN World Conference for Disaster Risk Reduction (WCDRR) in March 2015 in Sendai, Japan. The African Union's heads of states and governments have expressed their commitment for the implementation of the SFDRR as a means of sustaining the momentum generated by the Extended Programme of Action (Extended POA).

The African Union Executive Council at its 24th session, January 2015 [EX.CL/Dec.858 (XXVI)], requested the African Union Commission to facilitate the review of the Extended POA for the implementation of the ARSDRR in line with the post-2015 Framework for Disaster Risk Reduction. This call was also reiterated in the 23 July 2016 Yaounde Declaration on the Implementation of the Sendai Framework in Africa (Clause 32). Given that the timeframe for the Extended POA of the ARSDRR was up to 2015, this alignment required fashioning an action plan on the SFDRR for implementation in Africa.

Consequent to the decision and declaration, the Member States of the AUC undertook a two-step process to develop the PoA for implementing the SFDRR in Africa that involved: (a) assessment of the status of implementing the Extended POA in line with the HFA in Africa, and (b) modification of the Extended POA for the ARSDRR. The review showed that many areas of the POA were contributing to achieving the goal of the SFDRR and constitute elements of its implementation in Africa. This contribution was expected to be further enhanced through a more coordinated and systematic Programme to implement the SFDRR as the basis for a better risk-informed approach to disaster risk management (DRM) in Africa.

Consequently, the PoA was aligned to Sendai Framework and submitted to Executive Council for endorsement. The African Union Executive Council at its 30th session, January 2015 [EX.CL/Dec.943 (XXX)], endorsed the Programme of Action (PoA) for the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 in Africa, and the Mauritius Declaration on the Implementation of the Sendai Framework in Africa.

One of the targets established by the African Union Executive Council at its 24th session was to, "substantially increase the availability of and access to operational multi-hazard sub-national, national, and regional Early Warning Systems, assessment, and information by 2030. This task was further articulated in Annexure 1 of the report, Programme of Action (Phase I: 2016-2020) to Implement the Sendai Framework for Disaster Risk Reduction 2015-2030, where the continental level was made responsible for establishing guidelines for surveillance of continental risks and developing risk surveillance capacity as part of its responsibilities for establishing standardised methodology, guidelines, procedures, and

tools based on scientific evidence and local and indigenous knowledge for risk assessment and analysis.

The African Union (AU) and its organs were identified by the African Union Executive Council as the primary actor at the continental level. As had been previously outlined, the African Union Commission was instructed to focus on strategic guidance, facilitating, promoting the implementation of the ARSDRR, and seeking support from development partners and coordination at the continental level.

Consequently, the African Union Commission facilitated the development of the Africa Multi-Hazard Early Warning and Early Action System (AMHEWAS) Programme, with a series of engagements. In 2019, a team comprising of the AUC, RECs, and 16 Member States, with support from the United Nations Office for Disaster Risk Reduction (UNDRR) and the European Union, visited the European Union Emergency Coordination Centre in Brussels. The delegation also had the opportunity to visit and learn from the Italian Civil Protection operations at all three levels – national (Rome), regional (Genova), and local (Savona), as well as the headquarters of CIMA. One of the key deliverables was the development of a roadmap[1] for the establishment of the AMHEWAS, which was developed with the support of UNDP through the Sahel Resilience Project, financed by the Government of Sweden.

Hence, the purpose of the AMHEWAS Framework is to assist in the delivery of these AU commitments, by establishing a continent-wide institutional and organizational structure. This would include AMHEWAS development, coordination, and delivery, enhancing the link between early warning and early action through Impact-Based Forecasts (IBF) , and a focus on development of end-to-end warning systems comprising all four elements identified in the 2017 MHEWS Checklist. In doing so, the AMHEWAS Framework defines roles and responsibilities for MHEWS at three key levels: Member State, regional, and continental.

The Framework provides operational guidance on multi-agency and multi-sector coordination and communications structures at the Member States, regional and continental levels. The emphasis is on efficient exchange of data and information between each of those levels. This is intended to ensure that all those required to act in response to an early warning have access to the right information, at the right time, and in the most appropriate format. The final aim is to facilitate better and timely decisions and actions to prevent and mitigate severe disaster situations.

The Early Warning System should ideally spring into action prior to the impact of a hazard event. Hence the early warning segment, the preparedness and response element, of the AMHEWAS should include the preparation of contingency and response plans. The Early Action segment of the AMHEWAS include activation of those plans. Such actions may include, among others, evacuations of populations, or setting up of a screening protocol for increased health surveillance and monitoring at border crossings. All those preparedness and early response actions take place prior to an anticipated hazard. Once the anticipated hazard occurs and disaster response and recovery operations commence, the monitoring systems and information dissemination

1 African Union Commission (2020). Road Map for Improving the Availability, Access and Use of Disaster Risk Information for Early Warning and Early Action, including in the Context of Transboundary Risk Management. Addis Ababa, Ethiopia. Retrieved from: https://www.undrr.org/media/47944/download

structures within the AMHEWAS framework will continue to provide real- time information and forecasts required to assist decision makers in managing the response to, and early recovery from, the impacting event. Hence, the platforms established through this AMHEWAS framework will support the entire Emergency Management Cycle.

The Africa Multi-Hazard Early Warning and Early Action System is designed to deliver accurate, timely, and authoritative early warnings that provide sufficient time to reduce the possibility of personal injury, loss of life and damage to property, economic disruption, and environmental degradation. However, it is recognised that delivery of an effective and end-to-end AMHEWAS at MSs, RECs or continental levels will not occur overnight; it will take the long-term commitment of AUC, RECs, Member State governments, and development partners. Given that MSs and RECs are starting from a different position in relation to their MHEWAS provision, the various components of the continental MHEWAS will likely develop and build their capacity incrementally over time.

This Framework sets out the vision and objectives for the long-term development of a MHEWAS in Africa. It is designed to establish an institutional framework, encourage enhanced data exchange and partnerships across sectoral and jurisdictional boundaries, and to achieve better alignment of capacity building initiatives.

1.2 Methodology

One of the critical components of a resilient society is the existence of efficient Early Warning Systems (EWS) that can issue accurate and timely warnings, which are then available to be acted upon by relevant stakeholders (including civil protection institutions and national disaster management offices) hence minimising the negative consequences of disasters on people and their assets.

This Institutional and Operational Framework is based on an analysis of the early warning requirements of the whole continent, including Member States, RECs, and the continental level. Since enhancing early warning at all these levels is expected to be a long and demanding process, the Framework encompasses institutional as well as operational aspects for all three levels along with a way forward that looks at the long-term achievement and implementation.

The methodology used to arrive at the Framework included primary and secondary data collection for a detailed assessment of existing early warning and early action systems in relation to mitigation and response to natural hazards and disasters. Secondary data was based on literature reviews where case studies on early warning and early action were identified and analysis of governance systems, as well as financial, technological, and social characteristics that influence early warning as well as preparedness and response was undertaken.

Risk profiles developed under the EU-sponsored 'Building Disaster Resilience to Natural Hazards in Sub- Saharan African Regions, Countries and Communities'[2], as well as other similar studies focusing on the continent (e.g. GFDRR country

2 The five-year EU-funded programme, 'Building Disaster Resilience to Natural Hazards in Sub-Saharan African Regions, Countries and Communities' launched in 2015 aimed to provide effective implementation of an African comprehensive disaster risk reduction (DRR) and disaster risk management (DRM) framework.

Figure 1 : Work flow Overview

disaster risk profiles[3], the collection of risk atlases developed by UNDP in several African countries, and Global Assessment Report 2015), helped in identifying the main natural hazards around which the analysis revolved. In addition, new hazard, and risks such as the Covid-19 pandemic were included thus rounding- out the Framework for the EWS.

Primary data collection included an assessment tool, in the form of a survey questionnaire (included in Annexure 7) , that was administered to selected Member States and the information validated via follow-up interviews with the relevant stakeholders. The risk profiles prepared by the different agencies (above) informed the assessment tool. This along with information and data available with the Sendai Framework Monitor, in response to questions linked to Target G, comprised of the primary data sources.

The results of the assessment were used to develop initial concepts and structures for the first draft Framework. To ensure sustainability and ownership of the relevant stakeholders, extensive multi-stakeholder consultations and interviews with key focal persons nominated by the Member States and the RECs were carried out to draw-up the final draft Framework. A revised final draft of the Framework, after final consultations with the stakeholders, was presented the AUC for validation. The methodology used to produce the Framework comprises of four stages (illustrated in Figure 1), which are explained in detail in the subsequent sub-sections.

Stage 1 – Assessment of Existing Early Warning Systems

The first stage involved a comprehensive assessment of existing Early Warning Systems with the following specific objectives :

1. Conducting a detailed analysis of the status of Early Warning Systems, and level of preparedness of the Regional Economic Communities (RECs), and Member States
2. Identifying strengths, weaknesses, and threats of, and opportunities for the existing Early Warning Systems
3. Reviewing effectiveness of the systems in light of increased frequency and intensity of disaster events and risks
4. Assessing the interoperability of the Early Warning Systems between different levels, from continental to regional, and national to sub-national
5. Conducting detailed analyses of institutional and operational frameworks, and standard operating procedures (SOP) for existing early warning and early actions at national, regional, and continental levels

3 Global Facility for Disaster Reduction and Recovery, n.d. Disaster Risk Country Profiles. Available at: https://www.gfdrr.org/en/disaster-risk-country-profiles

A diverse range of stakeholders, operating at multiple levels within national, regional, and continental structures, are involved in the management and delivery of individual warning system components.

Therefore, a common assessment tool was required to collect and frame information it in a systematic and comparable manner for all the stakeholders involved. Established frameworks such as the WMO Multi-Hazard Early Warning System (MHEWS) guidelines[4], UNDP Five approaches to build functional Early Warning Systems'[5], the World Bank's 'Rapid Diagnostic User Guide', [6]and other operational tools implemented by UN and EU programmes over the past years, informed the development of the assessment tool.

The assessment tool for EWS evaluation for this study, was based on earlier methodology developed by CIMA Research Foundation and extensively tested in African countries[7].

This tool is anchored in the four elements of EWS defined by Sendai Framework and inspired by the World Meteorological Organization Checklist for multi- hazard early warning[8] and the Guiding Principles for Community Early Earning by the International Federation of Red Cross and Red Crescent Societies'[9].

The method consists of a 80-questions survey, encompassing the four elements of people-centred EWS, namely: disaster risk knowledge, monitoring and forecasting; warning dissemination and communication; and preparedness and response. The survey was designed to be completed in-part directly by relevant stakeholders at Member States, RECs, and continental levels, while the other part was based on an assessment of available documents. The survey culminated with follow-up interviews with stakeholders representing national, regional, and continental organizations.

The tool was used to establish a 'frame-of-reference for indicators' and the results obtained from the self-assessment were quantified by virtue of the format, where an attribute-based scoring system was used for every indicator and sub-indicator. The level of subjectivity is mitigated to some extent by the scoring system, that provides definitions for each score. The tool allows a comparability of data thus allowing drawing up key considerations and helping identify elements

4 World Meteorological Organization, 2020: Updates Guidelines on Multi-hazard Impact-based Forecast and Warning Services. Available at: https://public.wmo.int/en/media/news/wmo-updates-guidelines-multi-hazard-impact-based-forecast-and-warning-services

5 Five Approaches to Early Warning Systems UNDP, https://www.eurasia.undp.org/content/rbec/en/home/library/environment_energy/five-approaches-to-build-functional-early-warning-systems.html

6 The World Bank (November 2017). Ready to Respond: Rapid Diagnostic User Guide. Retrieved from: https://www.gfdrr.org/sites/default/files/ publication/R2R_RapidDiagnosticUserGuide_2017.pdf

7 The tool has been used in the context of the project 'Building Disaster Resilience to Natural Hazards in Sub-Saharan African Regions, Countries and Communities', financed by UNDRR ROA to build the baseline for EWS at the continental level (AUC) as well as in Angola, Ethiopia, Tanzania, and Zambia. An improved version of the tool has been also used within the Volta Flood and Drought Management (VFDM) project in cooperation with WMO to assess the EWS status in Benin, Burkina Faso, Cote d'Ivoire, Ghana, Mali and Togo. World Meteorological Organization, 2020. Volta Flood and Drought Management (VFDM Project. Available at: https://public.wmo.int/en/ projects/integrating-flood-and-drought-management-and-early-warning-climate-change-adaptation-0

8 World Meteorological Organization, 2018: Multi-hazard Early Warning Systems: A Checklist: Outcome of the first Multi-hazard Early Warning Conference from 22 to 23 May 2017 at Cancún, Mexico. Retrieved from https://library.wmo.int/index.php?lvl=notice_display&id=20228

9 The International Federation of Red Cross and Red Crescent Societies (2012). Community Early Warning Systems: Guiding Principles. Retrieved from: https://www.ifrc.org/document/community-early-warning-systems-guiding-principles

needed for the in-depth Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis.

In addition to the EWS initiatives for natural hazards, the draft Framework leveraged the experience acquired by the African counterparts in other EWS dealing with conflict and health, e.g. the Continental Early Warning System (CEWS) for data collection and analysis to advise the Peace and Security Council (PSC), on potential conflicts and threats to peace and security in Africa.Stage 1 was performed in three steps following a common methodology for such actions

Step 1. Introduction and Data Collection

At the beginning, a short inception phase was dedicated to consolidating the methodology and preparing the assessment tool. A first list of stakeholders was prepared using stakeholder mapping. To ensure adequate representation of all key stakeholders, a mix of professionals, operational forecasters and emergency managers, researchers and technologists, UN officials, representatives from the academia, private sector, and NGOs, was considered.

For this study, each Member State was asked to appoint a National Focal Point (NFP), supported by an Alternate National Focal Point (A-NFP). The role of the NFP was to act as national liaison officers between the Member States and CIMA. In most cases, DRR Focal Points with a sound knowledge and experience in EWS were appointed as NFP. To maximise efficiency of existing data, in addition to desktop research, five channels for data collection and analysis were used:

1. A detailed assessment tool, in the form of a survey questionnaire, previously developed and used by CIMA at the continental level,[10] was used for this analysis and administered to eight other countries[11] (one per REC). The tool was introduced to stakeholders at an Introductory Workshop (a summary of agenda is included in Annexure-9) and delegates were provided with electronic copies of the assessment. Nominated countries responded by answering the questions and populating the tool. Following this, a series of country interviews (see Annexures 4 -6) and workshops (see Annexure 8) were organised by CIMA to discuss initial responses, and to validate the information provided.
2. The data and information for twelve African countries and AUC[12] available to CIMA where the detailed assessment tool was previously employed, was added to the data from the studies set out in Step i earlier.
3. Secondary data based on literature reviews, included findings from several recent studies reviewing country-level Early Warning and DRM Systems, were incorporated into the analysis. The secondary data collection included an analysis of data collected on MHEWS in Africa by other projects and initiatives, for example, the Climate Risk and Early Warning Systems (CREWS) initiative mainly active in West and East Africa; the

10 AUC, Angola, Benin, Burkina Faso, Burundi, Cote d'Ivoire, Ethiopia, Ghana, Malawi, Mali, Togo, Tanzania, Zambia.

11 Morocco (Arab Maghreb Union , UMA), Nigeria (Community of Sahel–Saharan States, CEN-SAD), Egypt (Common Market for Eastern and Southern Africa, COMESA), Uganda (East African Community, EAC), Republic of Djibouti (Intergovernmental Authority on Development, IGAD), Mauritius (Southern African Development Community, SADC), Sierra Leone (Economic Community of West African States, ECOWAS), and Gabon (Economic Community of Central African States, ECCAS).

12 Angola, Benin, Burkina Faso, Burundi, Cote d'Ivoire, Ethiopia, Ghana, Malawi, Mali, Chad, Togo, Tanzania, Zambia.

Prevention Preparedness and Response to Disasters (PPRD) South III project mainly active in North Africa; and the UNDRR ROA – Sendai Monitor coordinator for reporting on Target G.

4. Data collected using a simplified self-assessment tool, developed by CIMA, (included in Annexure-7) was proposed to all countries and each REC, but especially targeted those thirty-five (35) countries for which no existing data was available from the processes listed in steps (i),(ii), and (iii) above. The assessment tool was introduced through an online workshop (a summary of the agenda is included in Annexure-9) where the objective of the assessment, the methodology and the tools used were communicated and explained to representatives from AUC, RECs, and Disaster Risk Management, and the Hydromet agencies of the participating states (who were identified based on the stakeholder mapping). The CIMA team provided online support in completing the assessment by liaising with relevant stakeholders at national and sub-national levels, and then conducted concluding interviews with each available country thus assuring a detailed assessment.
5. Where available, information and data that had been already produced to respond to Sendai Framework Monitor (responses to questions linked to Target G, questions 1-6) were used.

The data collection process also included gathering legal instruments, SOPs, data exchange and communication protocols, and existing data in connection with the EWS.

Due to the geographical scope of this study, which included a continental overview of EWS in the fifty-five Member States, and considering the extensive amount of data and protocols involved in EWS management, generalizations of the results were made in order to provide a more comparable output.

Step 2. Data Validation and Analysis

All data gathered from the initial data collection process were validated for accuracy and completeness. This process involved follow-up contacts with interviewees by video conference and by email. (A list of stakeholders interviewed is presented in Annexures 4 through 6 of this report.)

Complementary studies carried out in the region as well as previous initiatives and recommendations were used to both understand as well as corroborate the collected data.

Step 3. Assessment Report and Discussion Support

The initial findings and results of the overall analysis were formalised in a detailed assessment report, which presented a summary of the findings with concrete actionable recommendations for decision makers at the national, regional, and continental levels for localised, regional, and global disasters.

Stage 2 – Developing a First Draft Institutional and Operational Framework

The results of the assessment (Stage 1) were used to develop initial concepts and structures for the Framework and to help design further multi- stakeholder consultations and interviews. These engagements at the national, regional, and continental levels were organised to solicit views and inputs on emerging ideas and concepts for the first draft Institutional and Operational Framework. Inputs from stakeholders gathered during the period March–May 2021, were incorporated into

a consolidated first draft version of the framework used for further discussion with AUC and engagement of key stakeholders during Stage 3.

Key stakeholders approached and interviewed are listed in Annexure 4.

Stage 3 – Development of a Final Draft Institutional and Operational Framework

Based on the assessment and subsequent analysis in Stages 1 and 2, a preliminary version of the draft Framework for early warning and early action was developed in Stage 3.

Initial draft proposals and key concepts emerging from Stage 1 were presented and discussed at one of two framework development Consultation workshops. The event in English was held on 01 June 2021, and in French on 07 June 2021. (Summary agendas included in Annexures 9 and 10). The workshops were facilitated by the African Union Commission and were attended by Disaster Risk Management experts, Disaster Risk Reduction focal points, and other early warning stakeholders from the national, regional, and continental levels.

In order to ensure the introduction of a well-functioning EWS linking neighbouring Member States to the regional and continental levels, the final draft Framework also contained a checklist of legal acts to be adopted by each country.

Feedback from stakeholders attending these development workshops enabled the first draft Framework to be revised and updated further.

A final draft, incorporating the comments and feedback provided by stakeholders, was developed and presented at a further workshop held on 26 July 2021. Further options for implementation and delivery of the Framework were explored in the workshop. The feedback requested from participants included, examining coherence between the draft Framework and the current institutional setup; practicality of the proposed communication flows among the different institutions with responsibilities for AMHEWAS delivery; review of available data and sharing protocols; and other pertinent inter-linkages and codifications in the proposals with existing protocols, networks, and organizations.

Following the above workshop, the draft Framework was further revised, in consultation with African Union, to address stakeholder feedback and to produce a final draft. This was considered for the validation process in Stage 4.

Stage 4 – Validation of the Framework

Stage 4 dealt with fine tuning the final draft framework and developing a work plan. The final draft version of the Framework was presented to AU Member States and RECs and final inputs for the validation of the document were sought.

A work plan to implement the framework was included in the submission. Due to the COVID-19 pandemic-related restrictions, this validation was conducted virtually. A summary of agenda for the validation workshop is included in Annexure 11.

Final consultation with the stakeholders took place in a three-day in-person workshop held in Nairobi from 20-22 October 2021, with about 150 participants including delegates of Member States, RECs, and AUC as well as representatives from different international organizations active in the field of DRR and EWS attending the workshop. The agenda for the final endorsement meeting is included in Annexure 12.

The revised final draft Framework was presented and discussed in plenary and working sessions where delegates provided oral and written comments on the framework. All comments and requests for modification were included in a revised final version of the framework that was submitted to the AUC for a final validation.

The Framework captures guidance to continental, regional and national stakeholders on the critical operational and institutional aspects for the establishment of multi-agency and multi-sectoral coordination structures as well as data exchange and communication infrastructure with streamlined processes, protocols, tools and expertise, for accurate, timely and accessible early warning information, followed by early action at the Member State, regional and continental level.

1.3 International Guidance on the MHEWS

For many years, the development of Early Warning Systems that trigger effective Early Action has been recognised as a priority for saving lives and reducing the impact of disasters. Africa has systems in place that provide early warnings for meteorological, hydrological, geo-tectonic, conflict, and health hazards. However, in recent years there has been a growing recognition that disasters can have cascading impacts.

For example, the impact of a hazard such as drought can quickly become a serious impact for early warning in other areas, such as health, peace, and security. The cascading disasters involve trans- boundary considerations at the regional, continental, or global level. International guidance has therefore been developed to recognise the importance of effective coordination of Early Warning Systems across different sectoral disciplines and different jurisdictional levels.

Monitoring and warning systems for significant meteorological events have been in place for many years with the World Meteorological Organization (WMO) facilitating the adoption of international standards and coordination. Guidance related to early warning of severe weather events has provided a starting point for the development of many other types of Early Warning Systems, such as health and food security and conflict warning.

The Third International Conference on Early Warning (EWC III) held in Bonn, Germany in 2006 provided a guidance document, 'Developing Early Warning Systems: A Checklist' to support the implementation of the Early Warning components of the Hyogo Framework for Action (HFA). The Checklist recognised that early warnings are only as good as the actions they yield.

If a warning is given and the action it was intended to trigger is not undertaken, then the warning system has failed. Even if the individual technical elements, such as hazard monitoring services, functioned perfectly, the lack of follow-up action is deemed a failure for the early warning system.

Therefore, the 2017 Checklist recognised that four key elements (of risk knowledge, monitoring and forecasting, warning dissemination, and preparedness and response) must be in place and effectively coordinated for any warning system to operate effectively. Following on from the Hyogo Framework and the Early Warning 2006 Checklist, the Sendai Framework for Disaster Risk Reduction 2015-2030 recognised the importance of Early Warning Systems and further developed the requirements for such systems.

Figure 2 : Schematic diagram of a Multi-Hazard Early Warning System (Source: WMO, 2018: Multi-hazard Early Warning Systems: A Checklist)

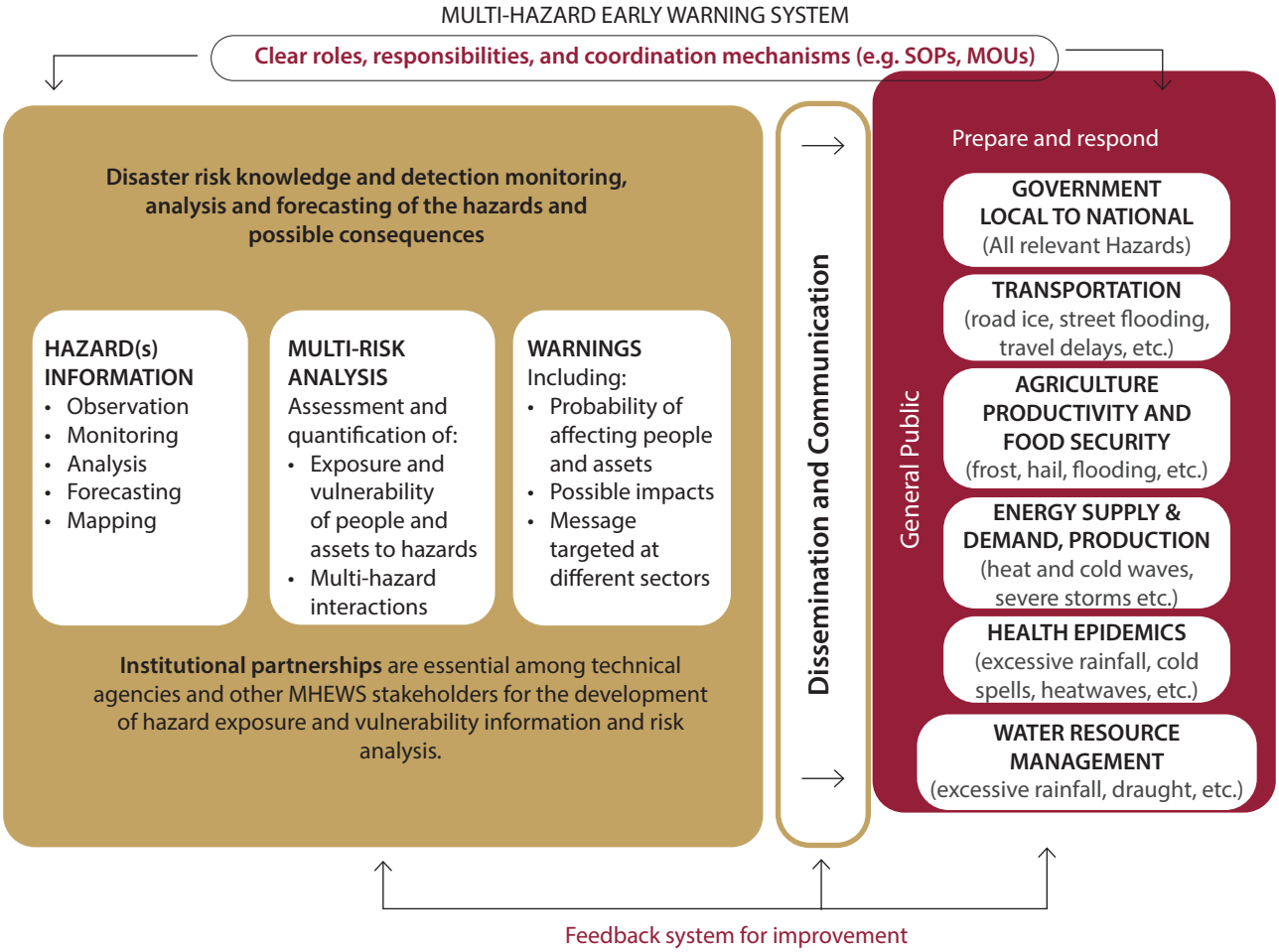


Figure 3 : Four Essential Elements of an End-to-end, People-centred MHEWS

Disaster risk knowledge

- Are key hazards and related threats identified?
- Are exposure, vulnerabilities, capacities, and risks assessed?
- Are roles and responsibilities of stakeholders identified?
- Is risk information consolidated?

hazards and possiblee consequences

- Are there monitoring systems in place?
- Are there forecasting and warning services in place?
- Are there institutional mechanisms in place?

Warning dissemination and communication

- Are organizational and decision-making processes in place and operational?
- Are communication systems and equipment in place and operational?
- Are impact-based early warnings communicated effectively to prompt action by target groups?

Preparedness and response capabilities

- Are disaster preparedness measures, including response plans, developed and operational?
- Are public awareness and education campaigns conducted?
- Are public awareness and response tested and evaluated?

Source: WMO, 2018: Multi-hazard Early Warning Systems: A Checklist

The Sendai Framework established a new global target (G which is to: "Substantially increase the availability of and access to Multi-Hazard Early Warning Systems and disaster risk information and assessments to the people by 2030".

In 2017, the 2006 Early Warning Checklist was further updated by the International Network for Multi-Hazard Early Warning Systems (IN-MHEWS to include the proposed revisions and acknowledge the Sendai Framework.

This revised checklist maintained the previously identified four main elements required for any warning system and added a revised definition of an Early Warning System as, "an integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities, systems and processes that enables individuals, communities, Governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events."

The term 'multi-hazard' was defined in the revised 2017 Checklist as:

1. The selection of multiple major hazards that the country faces, and
2. The specific contexts where hazardous events may occur simultaneously, cascadingly, or cumulatively over time, and taking into account the potential interrelated effects

Hazards typically included in a Multi-Hazard Early Warning System include, biological, environmental, geological, hydro meteorological and technological processes and phenomena.

The 2017 MHEWS Checklist provides a reference for AUC, RECs, national governments, relevant Ministries, Departments and Agencies, community organizations, and other national and international partners, when developing or evaluating Early Warning Systems.

The Checklist is not intended to be a comprehensive design manual, but instead a practical, non-technical reference tool to ensure that all the major elements of an effective Early Warning System are in place. An overview of MHEWS from the 2017 Checklist is presented in Figure 1, and the four elements of efficient and people-centred Early Warning Systems in Figure 2.

1.4. Utilising Traditional Knowledge Systems for EWS

It is recognised that Early Warning Systems should take into account the rich traditional knowledge held by community members. Through a history of living in the area and an extensive experience in being impacted by hazard events, many local communities have developed various ways, using locally available signs and indicators, through which they can forecast impending hazards. These signs and indicators serve as triggers for the local communities to take early actions that minimise the impacts. In developing a comprehensive MHEWAS at the sub-national and community level, and where possible, an integration of indigenous and scientific information in Early Warning Systems will contribute to community resilience to natural hazards. The integration of community knowledge can improve the accuracy and utility of the technical warning system, especially, disaster risk knowledge and hazard monitoring. Additionally, engagement of communities in design of their warning system ensures that community members are sensitised to the warning system and have

confidence in it. Thus improving both, warning dissemination and communication as well as preparedness and response, components.

1.5 Objectives of Africa Continental MHEWAS Framework

Hazards can cause disasters and crises that are increasingly multi-dimensional, severe, and frequent. Multi-dimensional risks require multi-dimensional approaches. Therefore, the aim of the continental MHEWAS Framework is to develop a robust and multi-hazard framework for Early Warning Systems that enable effective early actions to be taken prior to a disaster, thus reducing injuries, fatalities, and damage to property and the environment.

Meeting the objective of establishing the AMHEWAS by 2030 will address AUC commitment to deliver the goal set out in Target G of the Sendai Framework for Disaster Risk Reduction.

Delivery of the continental MHEWAS is complex and requires multiple activities to be coordinated over an extended period. Specific outputs and objectives set out in the AMHEWAS Programme include the following activities:

1. Establishment of a continental MHEWAS Programme
2. Establishment of common protocols and platforms for sharing data and risk information across sectoral and jurisdictional boundaries thereby enhancing risk knowledge
3. Capacity building and training to deliver enhanced round-the-clock (24/7) hazard monitoring, forecasting, and warning services, supported by the AMHEWAS Situation Room, resulting in enhanced monitoring and warning capabilities at Member States, RECs, and continental levels
4. Development and delivery of end-to-end warning dissemination and communication protocols and platforms, including the last-mile connectivity to ensure all those required to act and receive the warnings, leading to improved warning communication and dissemination both at, and between, MS, RECs, and continental levels
5. Development of protocols and materials to support effective planning, training, and simulation to ensure those required to respond to a warning can take effective early actions, leading to more effective emergency preparedness, early action, and response capabilities

Chapter 2 | Requirements for an Efficient Continental MHEWAS

2.1 General Provisions for Legal and Institutional Arrangements

Legislative structures that support policy or framework documents, and detailed institutional arrangements are the foundations upon which the previously outlined four elements of early warning are built, strengthened, and maintained. The 2017 MHEWS checklist proposes that an integrated and comprehensive legal and supporting policy framework, which clarifies the roles, responsibilities, and relationships of all stakeholders within the system, is required.

The AMHEWAS Institutional Framework sets out a vision and operational model for the long-term development of a continental-level MHEWAS (detailed in Chapter 3 and 4), which includes guidance for African Union Commission, Regional Economic Communities (RECs), as well as the Member States (MSs). With a range of measures designed to assist African Union Commission, Regional Economic Communities, and Member States in making more immediate improvements to existing sectoral early warning systems, Chapter 4 sets out a more practical short-term guidance. In order to drive more effective early actions that reduce the impact and losses associated with disaster events, the AMHEWAS also provides direction to put in place the building blocks and components necessary for the realisation of a truly Multi-Hazard Early Warning and Action System in the future.

RECs and MSs are responsible for ensuring that they have appropriate legal and institutional arrangements in place to ensure the effective coordination of MHEWAS at their respective levels as well as communication and coordination between MSs, RECs, and the continental levels. The guidance set out in this framework is designed to over time assist them in establishing the foundations necessary for development of MHEWAS. Those arrangements must also identify each organization responsible for separate components of a MHEWAS and set out how they can integrate and coordinate their work effectively to deliver an end-to-end warning service. The legal and institutional arrangements should be supported by more operationally- focussed plans and Standard Operating Procedures (SOPs) - this well ensure that technical specialists from each different discipline regularly interact and have a full appreciation of their own role, as well as that of their counterparts, in delivery of a MHEWAS.

Providing a clear legal, policy, and institutional base for delivery of AMHEWAS at continental, regional and Member States levels is essential to underpin long-term political and financial commitment to the systems, thus ensuring a mutually-supportive delivery maximising the accuracy and timeliness of the generated warnings.

Given the diversity of Regional Economic Communities in Africa, and of its Member States, each will need to enact suitable governance arrangements within their own statutory framework and budgetary arrangements. In most MSs, sectoral legislation and policy arrangements covering the MHEWAS are made by Ministries,

Departments and Agencies (MDAs). However, the assessment underpinning this framework identifies that there is a vast difference among the sectoral legislation for individual Early Warning System components, which have been enacted at different times, for different purposes, and using different and even contradictory language and definitions. It is also common to find that while multiple MDAs are given responsibility for specific MHEWAS components, none has been given overarching responsibility to bring together all the various components in order to deliver a single and effective end-to-end warning system.

To address this issue, it is proposed that RECs and MSs review their legal and institutional arrangements to rationalised references to MHEWAS components in sectoral legislation. The review should ensure the adoption of common definitions and language relating to Early Warning System components. Additionally, it is proposed that a single entity or MDA within each REC or MS be given responsibility for overall coordination of MHEWAS.

Generally, for MSs this coordination role may be given to the national DRM agency to ensure that data and information relating to multiple hazards can be effectively aggregated and disseminated through the national warning system.

Where a single MDA is nominated to coordinate MHEWAS delivery at MS level, it is discovered that in most cases that lead agency does not take responsibility for the technical provision of all associated components; these remain the responsibility of the appropriate sectoral agency. The role of the lead MDA is to provide overall coordination and direction for MHEWAS, ensuring the various MDAs responsible for individual MHEWAS components are working together.

MHEWAS legislation and policy documents at regional and Member States levels must be supported by operational plans and SOPs that provide more detail about how the duties should be undertaken. It is important that these supporting documents encourage multi-sector engagement and interaction and to ensure that people from different disciplines and backgrounds come together to coordinate their work on the various components of a MHEWAS. Legislation, policy, and supporting documents should also be so structured so as to facilitate and require local decision-making and participation in the design and operation of the warning system.

An Operational Model for consideration by RECs and MSs is set out in Chapter 4. RECs and Member States can also refer to the 2017 MHEWS Checklist to identify several cross-cutting issues that need to be addressed in early warning legal and policy documents. Some of the issues in the recognition of an ambition to work toward a multi-hazard approach to early warning include consideration of gender, age, disability, and cultural diversity in the design of the warning system.

One of the first steps in MHEWS development identified in both the 2006 and 2017 MHEWS check-lists is to identify all the potential stakeholders involved. The check-lists suggest that the principal stakeholders should, at a minimum include the disaster management authorities at the national, regional, and local levels, and the scientific and technical agencies responsible for monitoring hazards and issuing hazard warnings or advisories.

These could include, the National Meteorological and Hydrological Services (NMHSs), health authorities, geological services, ocean observing organizations, conflict warning services.

2.2 Guiding Principles for the Continental MHEWAS

Guiding principle 1 : INTEGRATION AND COMPREHENSIVENESS

For a Multi-Hazard Early Warning and Action System to operate effectively, local and national governments, Regional Economic Communities, and the AUC, should create an integrated and comprehensive framework. Paying particular attention to addressing the needs of the most vulnerable groups, the Framework should clarify the roles, responsibilities, and relationships of all stakeholders within the system.

Guiding Principle 2 : RISK INFORMATION

For a MHEWAS to operate effectively, comprehensive information, related to persons, communities, organizations, and countries and their assets, is required on all the dimensions of disaster risk, including hazards, exposure, vulnerability, and capacity.

Guiding Principle 3 : SCIENTIFIC AND TECHNOLOGICAL BASIS

Multi-hazard monitoring and forecasting services must be established with a sound scientific and technological basis.

Guiding Principle 4 : TIMELINES

Warning communication and dissemination systems (including the development of last-mile connectivity) must ensure that decision makers and communities required to act, receive warnings in advance of impending hazard events.

Timely exchange of data and information both at and among the national, regional, and continental levels is essential in facilitating effective early action.

Guiding Principle 5 : AWARENESS

Through effective contingency planning and enhanced risk education, institutions and people must be empowered and prepared to act early and respond to a warning.

Guiding Principle 6 : COOPERATION

Provision of effective early warning depends on effective cooperation and coordination across sectoral disciplines as well as among sub-national, national, regional, continental, and international bodies.

Guiding Principle 7 : SUSTAINABILITY

Early Warning Systems can only deliver the anticipated benefits if all parts of the end-to-end system are adequately maintained. This depends on the long-term financial support and commitment of the governments to ensure that relevant agencies have the funding and technical capacities necessary to deliver essential services.

Guiding Principle 8 : SHARED RESPONSIBILITY

It must be ensured that all stakeholders, each with its own mandate and mission, are all involved in the early warning and early action system. These include continental, regional, national, and sub-national organizations, and sectoral departments.

Guiding Principle 9 : GOVERNMENT ACCOUNTABILITY

Disaster prevention and risk reduction is the primary responsibility of the respective national governments.

2.3 Overview of Current Roles and Responsibilities

As set out in Chapter 1, an end-to-end Early Warning System depends on the effective

coordination of several elements. Those constituent elements are delivered by separate sectoral bodies at continental, regional and Member States levels. The principle of subsidiarity regulates that Member States have primary responsibility for development and maintenance of warning system components, with support and coordination provided by Regional Economic Communities. Similarly, Regional Economic Communities and Member States are supported by the African Union Commission, for example, in coordination of programmes, provision of training,and sharing of good practices.

Warning systems for some hazards are already harmonised at continental level. For example, the African Centre of Meteorological Applications for Development (ACMAD) monitors meteorological events, the continental Early Warning System monitors conflict, and Africa Centre for Disease Control and Prevention (Africa CDC) monitors health related threats, such as infectious disease. A similar range of specialist sectoral bodies and agencies operate the separate components of an Early Warning System at MS and REC levels.

Various departments at continental level are already tasked with duties that can either benefit from or contribute towards the delivery of AMHEWAS. A brief description of the key departments and their role is set out below.

The **Department of Agriculture, Rural Development, Blue Economy, and Sustainable Environment (DARBE)** plays a central role in the system as it has the mandate to facilitate and coordinate the implementation of the African Regional Strategy on Disaster Risk Reduction (DRR) and its Programme of Action (PoA) in line with the Sendai Framework. DARBE is also mandated to enhance capacities of Member States and RECs to access near real time environmental monitoring, which is important for policy and decision-making, and for development planning. Importantly, near real-time environmental information is particularly relevant to support trans-boundary risk management and prioritisation of supranational interventions. As such, DARBE, as part of its climate adaptation actions for multi-purpose climate, weather, and water services, also has the potential to coordinate policy on EWS and preparedness.

The AMHEWAS Situation Room being developed by DARBE will play a critical role in delivery of AMHEWAS. The operation and function of the AMHEWAS Situation Room is set out in more detail at Annexure 2.

The **Department of Political Affairs, Peace and Security (PAPS)** is responsible for promoting, facilitating, coordinating and encouraging democratic principles and the rule of law, respect for human rights, participation of civil society in the development process of the continent, and the achievement of durable solutions for addressing humanitarian crises. The responsibilities for humanitarian assistance are particularly relevant in its role in engaging UN entities. The department also supports the Peace and Security Council (PSC) in the exercise of its responsibilities under the PSC Protocol. It leads the main activities of the AUC related to peace, security, conflict resolution and the promotion of stability. PAPS is also responsible for conflict prevention and early warning, as well as crisis management and post-conflict reconstruction. As such, PAPS has an established capability and a robust capacity of intervention in the field during disastrous events, including for Search and Rescue (SAR) activities.

The **Department of Health, Humanitarian Affairs and Social Development (HHS)** works to promote the AU's health, labour, employment, migration, social development, drug control, crime prevention, sport, and cultural agenda.

Because health implications during disasters are crucial to assess and mitigate, HHS's role in the event of disasters is notably important. With this in mind, HHS's cooperation with the Africa Centres for Disease Control and Prevention (Africa CDC) is highly strategic.

HHS, through its function Humanitarian Affairs, Refugees and Internally Displaced Persons (HARDP), can also provide insight into the link between disasters and migration, as well as identification of Internally Displaced Persons (IDPs), during or in the immediate aftermath of a disaster.

HHS is also responsible for promoting social protection during emergencies in order to increase the resilience of the population through disaster risk financing mechanisms. Such risk transfer mechanisms are essential for an efficient DRM cycle implementation and can be naturally linked to EWS (e.g. through parametric insurance).

The **Department of Education, Science, Technology and Innovation (ESTI)** coordinates the AUC Programmes on human resource development, education, science, technology, and promoting the youth development agenda. This department provides different key contributions to the coordination function: through the provision of technical capacity in the fields of GIS and data analysis, or by creating link with the capacity development network in cooperation with universities and research centres to support the coordination function.

2.4 Role of Existing Warning System Departments and Agencies

There are many existing warning system departments and agencies operating at continental, regional and Member States levels. Some of these bodies, such as the continental Early Warning System for conflict, have responsibility for provision of an end-to-end sectoral warning system. Others may only have responsibilities for individual warning system components, such as hazard monitoring and forecasting. While most current warning systems are associated, in one way or another, with Hydromet-related hazards, the AMHEWAS should take account of the contributions of all hazard monitoring agencies in delivery of current and future warning systems. For example, space agencies provide increasingly valuable information on hazard monitoring and mapping and should be incorporated where appropriate. With the potential to impact power and telecommunications networks, warnings of solar storms should also be considered in the overall long-term structure of AMHEWAS. Taking a multi-hazard approach to an early warning and early action systems' design and operation does not change the role or responsibilities of any of these specialist agencies and departments. Instead, the Africa MHEWAS provides a single overarching framework for coordination, cooperation, and information exchange between the various bodies responsible for sectoral warning systems, or warning system components. While the role and responsibilities of existing early warning bodies may be unchanged by the continental MHEWAS, the formalised exchange of data and information, and sharing of good practices, across organizational, sectoral, and jurisdictional boundaries, will assist in improving the functionality of all warning system components. It will also provide a platform to

identify opportunities for joint capacity building and partnership initiatives that will enhance performance and/or reduce the cost for delivery of Early Warning Systems. Formalised collaboration between bodies undertaking warning system, offers numerous opportunities and advantages. Although they are only intended to be indicative of potential partnership opportunities, some examples are mentioned below.

Examples of collaboration among multi-sectoral partners

1. Working to better understand vulnerability and risk forms a critical part of the Disaster Risk Knowledge component of any warning system. Vulnerability data and risk information gathered to inform one sector warning system, for example for flood risk, may be of value to other stakeholders and sectors, for example, to inform a warning system designed for landslide risk. Commissioning joint vulnerability assessments informing multiple warning systems or ensuring that any assessments commissioned meet minimum standards and are made available to all warning system stakeholders will improve the accuracy of system design as well as reduce costs.

2. Requirements for warning dissemination and communication are common across many sectoral warning systems. Development of common protocols, systems, and technologies could reduce costs, enhance reliability, and add value to multiple warning systems. This is especially important in delivering last-mile connectivity, thus ensuring the most vulnerable receive warnings in a reliable and timely manner. Developing a single warning dissemination protocol for all sectoral warnings will ensure that clear and actionable warnings are not only delivered reliably, but that the costs for dissemination equipment (where required) are shared across multiple warning system operators.

3. Formalised exchange of data and information across sectoral and jurisdictional boundaries will enable better identification and address of transboundary and cascading risks. It will also reduce warning system costs by avoiding duplication of effort and improve system functionality by ensuring that high quality data is available.

4. Shared use of hazard monitoring and forecasting capabilities developed at the regional and continental levels can reduce duplication of effort and allow Member States to concentrate their national investment and capacity building on those elements of the warning system that will deliver most benefit.

2.5 Responsibilities for Delivery of the AMHEWAS Programme

As set out in 3.2 above, the roles and responsibilities of existing early warning departments and agencies is unchanged by adoption of the continental MHEWAS. However, a new collaborative framework is required to enable stakeholders to work together in order to deliver the AUC's vision of a continental MHEWAS by 2030.

Given the multitude of stakeholders involved at different levels, and the fact that all MSs and RECs are at a different stage in development of their own MHEWAS, the AMHEWAS Programme set out in Chapter 3 establishes a seven-year Programme for the AMHEWAS development broken down into three distinct stages. During the development of the AMHEWAS Programme, the focus will be on

supporting and enhancing the capacity of existing sectoral warning systems.

While the seven-year AMHEWAS Programme will concentrate on capacity building and enhancement of existing warning systems, stakeholders will be consulted on how the warning system improvements and enhancements delivered through the Programme can be sustained in the long term. Proposals for the establishment of permanent structures for collaboration and coordination of warning systems at continental level will be developed, piloted, and presented to the decision makers for their consideration.

AUC has made a commitment to establish a continental MHEWAS by 2030, and DARBE is the responsible department for coordinating the AMHEWAS Programme. DARBE will be supported in this work by AMHEWAS Coordinators and Early Warning Technical Working Groups (EW-TWGs) appointed at MSs, RECs, and continental levels, which will be responsible for oversight and delivery of the AMHEWAS Programme.

One of the tasks to be undertaken in delivering the AMHEWAS Programme set out in Chapter 3 will be to consider and refine proposals for the permanent operation of AMHEWAS beyond the seven-year AMHEWAS Programme.

2.6 Responsibilities for the AMHEWAS in the Long-term (beyond the seven-years)

A long-term model for AMHEWAS delivery, setting out roles and responsibilities for its sustainable delivery, will be developed as part of the seven-year AMHEWAS Programme and presented to decision makers for their consideration.

The draft model (Chapter 4) describes the potential roles, responsibilities and structures envisaged for the long-term delivery of a continental MHEWAS. This draft model was developed through initial consultations with stakeholders but will be further reviewed and revised during Stages 1 and 2 of the AMHEWAS Programme by AMHEWAS Technical Working Groups to take account of the experience gained through a multi-agency and multi-sector consultation process.

The roles and responsibilities, as described in Chapter 4, should therefore be considered as a starting point for the work to develop a long-term solution for AMHEWAS, rather than a blueprint that cannot be amended.

Figure 4 : Overview of the Continental MHEWAS Programme

ACTIVITIES	OUTPUT	OUTCOME	OVERALL OBJECTIVE	IMPACT
1. Initiation of Continental MHEWAS 2. Sensitization of decision-makers 3. Appointment of MHEWAS Coordinators 4. Establishment of EW-TWGs 5. Organization of Continental MHEWAS Summit and biennial MHEWAS Conference	AMHEWAS Programme approved	MHEWAS Programme rolled out at continental, regional, and national levels	Substantially increase the availability of, and access to multi-hazard early warning systems and disaster risk information and assesment to the people by 2030	REDUCE MORTALITY REDUCE ECONOMIC LOSSES PROTECT LIVELIHOODS
6. Enhance protocols on hazard vulnerability & risk assessment 7. Establish MOU for sharing data and risk information 8. Develop common repository of data & risk information 9. Support training and capacity building	Establish common protocals & platforms for sharing of data & risk information	Enhanced risk knowledge		
10. Create protocals for exchange of warning 11. Establishing the AMHEWAS Situation Room 12. Capacity building for monitoring & forecasting 13. Training of monitoring & forecasting practitioners	Enhance round-the-clock (24/7) hazard monitoring & warning	Enhanced monitoring and warning capability		
14. Evaluation & testing of warning dissemination 15. Establish dissemination guidlines and SOPs 16. Adoption of Common Alerting Protocol 17. Deployment of telecom technologies 18. Piloting & adoption of Continental MHEWAS	Deliver end-to-end warning dissemination including last mile connectivity	Improved warning dissemination & communication		
19. Prepare multi-hazard early action plans 20. Develop risk sensitization & training materials 21. Develop training for responders on MHEWAS early action 22. Conduct regular simulations & exercises	Develop protocols and materials for planning and training exercises	Effective preparedness, response, & early action capabilities developed		

Chapter 3 | Governance and Institutional Arrangements for the Continental MHEWAS

3.1 Overview of AMHEWAS Programme

As set out in the preceding chapters, a fully operational and end-to-end Multi-Hazard Early Warning and Action System (MHEWAS) requires the engagement and harmonisation among multiple stakeholders working across multiple sectors in delivery of four key elements of an Early Warning System, namely, risk knowledge, monitoring and warning service, warning dissemination and communication, and preparedness and response capability.

Even if the Programme, at the level of the AU Member States, has complete political, professional, and financial support, an end-to-end fully operational AMHEWAS is a complex task that may take several years to achieve. Enacting a MHEWAS that addresses the needs of and inputs from of Member States, Regional Economic Communities and the African Union Commission introduces additional levels of complexity. Development of a continental MHEWAS should therefore be seen as a long- term process of continual improvement, capacity building, and closer harmonisation of Existing Warning Systems.

The overall objective of the MHEWAS Programme is to deliver to AUC's goal of fulfilling global Target G of the Sendai Framework for Disaster Risk Reduction.

The impacts expected to be delivered as a result of achieving this target include, reductions in mortality; reductions in economic losses; and protection of livelihoods, development gains, and the environment.

The continental MHEWAS will be implemented through a seven-year AMHEWAS Development Programme coordinated by the DARBE at AUC, and supported by multi-agency and multi-sector Early Warning Technical Working Groups (EW-TWGs) at continental, REC, and MS levels.

To encourage investment, capacity building, and improvement in current warning systems, and to guide and direct this long-term process for AMHEWAS delivery, the seven-year Programme consists of three distinct stages, each broken down into several activities. Each of those activities may be broken down further into specific additional actions required to address that activity.

Delivery of key activities will enable the AMHEWAS Programme to deliver five specific outputs:

1. Establishment of the continental MHEWAS Programme
2. Establishment of common protocols and platforms for sharing data and risk information
3. Enhancement of round-the-clock (24/7)hazard monitoring and warning Services

4. Delivery of functional end-to-end warning dissemination and communication systems, including the vital last-mile connectivity

5. Development of protocols and materials for preparedness, including planning and training exercises

These outputs are essential to substantially increase, by 2030, the availability of and access to Multi-Hazard Early Warning and Action Systems and disaster risk information and assessments. An overview of key activities, outputs, specific objectives, and the overall objective and impact, are set out in Figure 4 below.

A more detailed indicative AMHEWAS Delivery Plan is set out in Chapter 4. The Programme stages and target dates are indicative and were established to enable the AUC to meet its current commitment to deliver AMHEWAS by 2030.

However, an important feature of the Programme is an annual appraisal by Technical Working Groups and decision makers to enable them to evaluate developments and adapt the Programme as necessary. The decision makers should consider bringing the elements of the AMHEWAS Programme, including the agreement on a permanent continental model, forward for action and adoption more quickly wherever technically possible.

3.2 Interim Arrangements

Chapter 4 provides a draft model for delivery of a continental MHEWAS that is intended to provide a starting point for the work of EW-TWGs and decision makers . The EW-TWGs and decision makers may choose to enact elements of the draft AMHEWAS Delivery Plan as soon as circumstances allow. For example, operationalisation of the AMHEWAS Situation Room at continental level will support capacity building and enable greater coordination of natural hazard early warnings.

Decision-makers at continental, REC, and MS levels, advised by their MHEWAS Coordinators and EW-TWGs, can determine the most appropriate interim arrangements for early warning, always focusing on the long-term goal of developing an effective AMHEWAS.

However, it is recognised that beyond the seven-year programme-delivery phase, the model as well as the detailed proposals for delivery and maintenance of AMHEWAS, are likely to change. The change will encapsulate and reflect new developments in warning system technology as well as experience gained from the delivery of this Programme.

Arranging the AMHEWAS Programme in three stages, each with a formal reporting and decision-making process, provides opportunities for decision makers to review progress and revise proposals at each stage before authorising the next. It also recognises that in the early years of the programme, the key challenge will be delivery of capacity building and training necessary to support the subsequent stages of the programme.

The AMHEWAS Delivery Plan schedules a decision on the permanent continental MHEWAS model in year five of the Programme, leaving the remaining two years of the Programme for operationalisation of the agreed-upon model. While an overview of the AMHEWAS Programme is presented below,

a more detailed indicative Delivery Plan is included in Annexure 3.

3.3 Governance Arrangements for the Continental MHEWAS Programme

Delivery of the AMHEWAS Programme requires the full support of the decision makers at all levels. It must therefore commence with a sensitisation of decision makers . An 'AMHEWAS Programme Development Conference', organised by AUC-DARBE, will include an orientation as well as formally initiate the MHEWAS Programme.

A key task for DARBE will be to identify and engage all relevant stakeholders across sectoral and jurisdictional boundaries to ensure that different elements of the AMHEWAS Programme are properly planed and harmonised.

The final invitation list for this AMHEWAS Programme Development Conference should therefore be considered and approved by DARBE in consultation with relevant continental AUC Departments and international bodies and partners. The following illustrative list is intended as a guide to discussions.:

1. Members of the DRR unit and DRR interdepartmental working group

2. Technical representatives from all relevant departments under the AUC responsible for issuing early warnings for five main thematic hazards, namely:
    a. Hydro meteorological
    b. Geotectonic
    c. Food Security
    d. Health & Pandemics and
    e. Conflicts

    These could be representatives from agencies including, but not limited to, ARBE, ETIM, ESTI, PAPS, HHS, ACMAD, CEWS, etc.

3. International bodies and partners including FRC, WMO, WHO, FAO, UN Representation (UN OCHA, UNDRR, UNHCR, UNESCO, UNDP) World Bank, African Development Bank, etc.)

The Continental AMHEWAS Programme Development Conference should consider and propose the appropriate governance and reporting arrangements for delivery of the AMHEWAS Programme, including reporting arrangements to existing structures such as the Africa Working Group on DRR and similar structures at REC and MS level. The Conference should also be asked to affirm the creation of two critical coordination structures specifically to direct and monitor AMHEWAS delivery during the seven-year AMHEWAS Development Programme;

1. MHEWAS Coordinators: senior figures appointed at Member States, regional and continental levels to act as the 'champion and focal person' for development of the continental MHEWAS and its components.

2. Early Warning Technical Working Groups (EW-TWGs): multi-agency and multi-sectoral groups established at Member States, regional, and continental levels, bringing together leading technical specialists in Early Warning System design and delivery. A range of specialists should be selected to represent all four elements of an EWS: risk knowledge, monitoring and warning services, warning dissemination and communication, and preparedness and response. EW-TWGs may, as required, establish sub-groups to work on sector-specific or technical issues.

In addition to proving authorisation for commencement of the AMHEWAS Programme, decision makers attending the AMHEWAS Programme Development Conference should provide a commitment to the provision of the necessary funding and resources necessary for its delivery. One of the key roles for MHEWAS Coordinators, supported by members of EW-TWGs, is to ensure that political leaders and strategic stakeholders at their respective levels, are fully engaged, and that the business case for development of an effective continental MHEWAS, both in human and financial terms, is fully understood. Achievement of AMHEWAS by 2030 will require a steady political commitment.

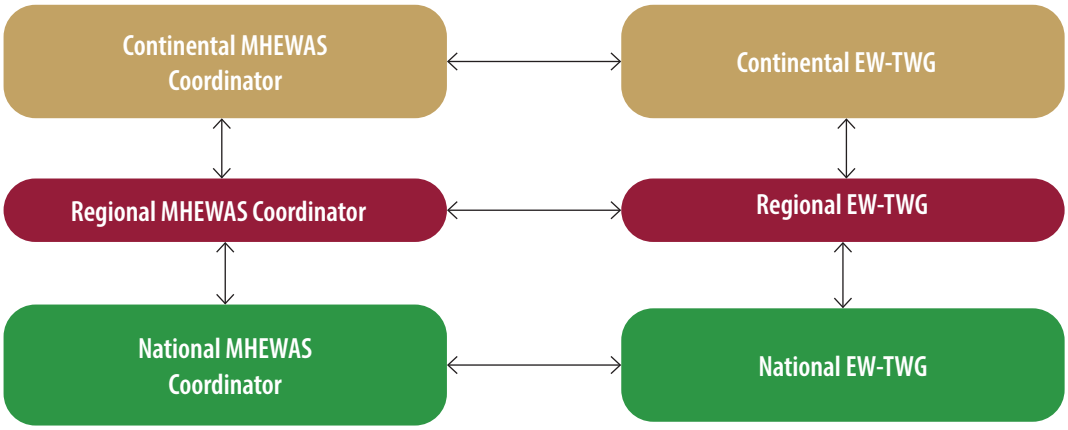
Translated into appropriate legislation and funding decisions (especially during Stages 2 and 3 of the Programme), the MHEWAS Coordinators have a critical role in delivering this commitment. Acting as advocates for early warning and multi-hazard system development, the MHEWAS Coordinators will need to ensure that decision makers appreciate that there is a good return on investment that may be delivered through a properly funded AMHEWAS.

MHEWAS coordinators also play a critical role in their respective EW-TWGs, providing leadership, encouragement, and support for the various technical experts forming the group. Working together under the leadership of AUC, MHEWAS Coordinators and EW-TWGs will establish the strategic network required for AMHEWAS policy formulation and information exchange, providing a robust link between MSs, RECs and continental levels. EW-TWGs also provide a forum for multi-sector experts to share data and information and liaise on Early Warning System development.

The forum will provide an opportunity to develop business case examples demonstrating return on investment, and work together to attract external funding support for capacity building.

EW- TWGs are responsible for the provision of technical input for the AMHEWAS Delivery Plan, and for providing an expert source of technical advice, support for capacity building, and improvement of existing Early Warning Systems. An illustration of the communication structure for AMHEWAS linking Coordinators and EW-TWGs at each level is in Figure 5.

Figure 5 : Proposed AMHEWAS Governance Structure - Continental Overview (illustrative)



During Stage 1, EW-TWGs will concentrate on sensitising decision makers and securing a steady political and financial commitment to AMHEWAS delivery. Other Stage 1 priorities include, input and technical support for establishment of the AMHEWAS Situation Room, and capacity building of existing national, regional, and continental- level Early Warning Systems related to natural hazards.

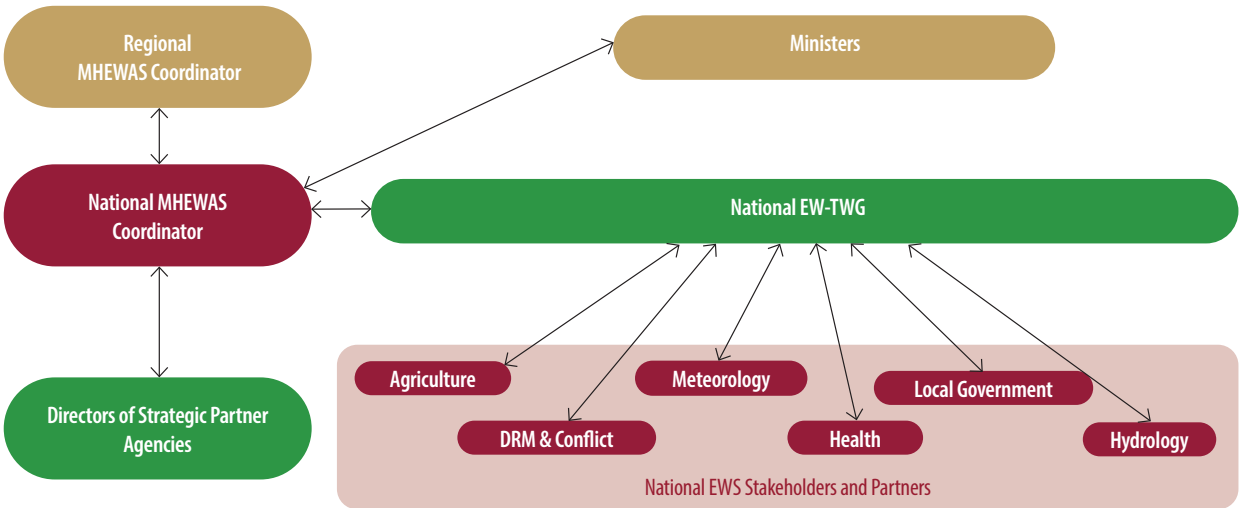
By regularly listening and sharing information, EW- TWGs can help to ensure that lessons learned, and data gathered for ongoing early warning projects can be shared, both to deliver immediate benefits and efficiencies for those individual projects,and to ensure greater harmonisation within the continental MHEWAS in the long term. For example, developing and sharing standardised SOPs for data and information exchange at the MSs, RECs or continental levels will improve the effectiveness of those systems and reduce the costs and burden of developing separate SoPs for each project.

A lack of adequate funding and technical capacity, especially at the Member States level, is recognised as one of the existing barriers to effective early warning system delivery. Working in partnership across MSs, RECs and continental level can help to address these issues by reducing the cost of warning system delivery by avoiding duplication of effort and ensuring shared access to technical specialists. The resulting savings in resource and technical specialists' time can then be used by MSs to where they can deliver best efforts.

An additional challenge identified at all levels, is that of integrating the work of multiple sectoral stakeholders responsible for individual warning system elements, such as risk knowledge, hazard monitoring, dissemination and communication of warnings, and preparedness and response. EW- TWGs provide a forum to bring these diverse stakeholders together so that they can reach mutually agreeable and beneficial solutions to address challenges to early warning challenges.

A model AMHEWAS governance structure is set out in Figure 6. The provided structure and list of national stakeholders and partners are only illustrative. It is for specific MSs to determine the appropriate structure and stakeholder list to meet their needs and tailor to their particular situation and context. The key outcome is ensuring full and multi-sectoral participation in EW-TWGs.

Figure 6 : Proposed AMHEWAS Governance Structure – National Overview (illustrative)



3.4 Appointment of MHEWAS Coordinators

3.4.1 MHEWAS Coordinator Appointments

It is proposed that the position of an MHEWAS Coordinator be established within the African Union Commission, all Regional Economic Communities, and all Member States.

Coordinators should be appointed by the lead sectoral body for coordination of Multi-Hazard Early Warning and Early Action Systems at each respective level. At MS level, this will generally be the Minister, Ministry, or Department with overall responsibility for the Disaster Risk Management. At REC level, this will generally be the DRM Unit, and at continental level AUC will make the appointment. To support MHEWAS Coordinators in their role, consideration should be given to the appointment of a deputy coordinator, and a communication and advocacy officer.

Each Coordinator should be mandated to interact with all departments and agencies at their respective levels that have an existing mandate to issue early warnings or deliver one or more of the components of an Early Warning System. As a minimum, this should include those departments or agencies responsible for issuing warnings related to natural hazards such as hydrological, meteorological, and geological departments, and their DRR counterparts responsible for risk assessment, warning dissemination and preparedness activities.

Although the initial stages of MHEWAS development are concentrated on sensitisation of decision makers and enhancement of early warning for natural hazards, MHEWAS Coordinators should make early contact with counterparts from warning system operators for health and conflict within their respective jurisdictions. This will ensure that any opportunities for data sharing, and creating and working in partnerships can be identified and actioned at an early stage in the Programme, and lessons learned in one sector can be shared across all other warning systems.

The Continental MHEWAS Coordinator will act as the focal point for the seven-year AMHEWAS Programme and will put in place and monitor plans to deliver the Programme in line with the agreed Programme Plan. MHEWAS Coordinators at MSs, RECs and continental levels will also act as expert advisors on Early Warning System design issues at their respective level and will,as and when required, provide briefings and guidance for decision makers .

The MHEWAS Coordinator position need not be a full-time commitment. Particularly, at the MS and REC level, this role may be allocated to a suitable Senior Manager with existing responsibilities for DRR or Early Warning System development.

However, there may be benefits in establishing the Continental MHEWAS Coordinator as a full-time role, allowing the holder of the position to act as overall Programme Delivery Manager in addition to their coordinator duties.

Key selection criteria for all MHEWAS Coordinators, at any level, include a good understanding of the requirements for an end-to- end Early Warning System, and preferably technical experience in delivery of at least one of the four elements of a warning system. Individuals selected as MHEWAS Coordinators should have sufficient authority and experience to enable them to effectively convene

all the concerned stakeholders and then liaise and coordinate with them in delivery of the AMHEWAS Programme.

The roles and responsibilities of MHEWAS Coordinators at MSs, RECs and continental levels are very similar, although their respective operating environments will be very different. The precise job descriptions and terms of reference for each MHEWAS Coordinator should be adapted to suit the context and existing structures of the appointing body within which they will operate.

However, the following generic guidance is intended to assist those appointing bodies and may be included as a minimum.

Essential Experience

1. Senior Management experience within a Hazard Monitoring or DRM Unit, Ministry, Department or Agency, including experience in working with, and reporting to, decision makers
2. Recognised qualifications in a specialist hazard monitoring discipline (i.e. Hydromet, health or conflict), or in DRM, civil protection, or similar
3. Experience in project or programme
4. Management and production of technical papers and reports
5. Excellent interpersonal skills and the ability to communicate and work effectively with multi-agency and multi-sector partners.

Desirable Experience

1. Management and delivery of an existing Early Warning System, or management of a major warning system component such as a meteorological, hydrological, health or conflict hazard monitoring service, or Management of a DRM unit, agency, or Emergency Operations Centre.
2. Strategic planning and budgetary experience.

3.4.2 Roles and Responsibilities of the MHEWAS Coordinator

1. Responsibility for the MHEWAS Programme management and delivery at their respective level (MS, REC, or continental)
2. Identification and mapping of Ministries, Departments, Agencies (MDAs) and Partners responsible for delivery of Early Warning System components, or for operating sectoral Early Warning Systems
3. Engaging actively with these MDAs and Partners to identify a suitable representative with experience in early warning to be a member of multi-hazard Early Warning Technical Working Group (EW-TWG)
4. Establishing an EW-TWG at the level for which they are responsible and agreeing a term of reference with decision makers aligned to delivery of the AMHEWAS Programme but contextualised to local needs, existing structures, and circumstances
5. Establishing a team to act as Secretariat to the EW-TWG
6. Reporting to senior level administrative and decision makers at their respective level on early warning and early actions
7. Acting as the focal person and main liaison point between the various MDAs involved in early warning delivery at their respective level, and as point of contact on MHEWAS for other MHEWAS Coordinators and external partners
8. Engaging with all EW stakeholders at their

respective levels to develop a Memorandum of Understanding for communication and sharing of data related to hazards, vulnerability and risk, and other information relating to disasters and other similar events requiring issue of early warning and activation of early actions

9. Supervise the implementation of decisions, projects and programmes related to Multi-Hazards Early Warning System at their respective levels
10. Sensitisation of decision makers at their respective levels on the benefits and requirements for MHEWAS. This should include the development and presentation of 'invest to save' business cases for MHEWAS that emphasise a good return on investment that may be delivered through the allocation of adequate and sustainable funding for MHEWAS.

In addition, the Continental MHEWAS Coordinator will be responsible for;

11. Acting as the lead and focal person for the AMHEWAS Situation Room
12. Acting as adviser to Council of DRR Ministers, AUC Executive Council and AUC Summit on Early Warning and Early Actions
13. Assisting AUC to prepare Draft Decision Papers on Early Warning to be tabled to the Executive Council and Minister's Meetings for endorsement of decisions

One of the key benefits of developing an effective Multi-Hazard Early Warning System is that it enhances the accuracy and effectiveness of individual sectoral warnings by effective sharing of information and data. It also reduces the costs and burdens for the individual sectoral warning systems by avoiding duplication of effort, overlapping of roles, and procurement of incompatible equipment and ICT. This will not be achieved through a single one-off activity, but through a long-term process of capacity building and harmonisation that will commence with the seven-year AMHEWAS Development Programme.

Early Warning Technical Working Groups (EW-TWGs) will be established at Member States, RECs, and continental levels to lead and provide technical input to this capacity building and harmonisation process.

To be effective, EW-TWGs must be multi-agency and multi-sectoral bodies. Membership should include operators from all sectoral warning systems, including natural hazards, health, and conflict. In addition to being multi-sector, the EW- TWGs should include representation from all departments/agencies, within their respective jurisdictions, mandated to deliver essential Early Warning System components. This introduces a more diverse range of stakeholders that need to be engaged and incorporated into the AMHEWAS Programme.

3.5 Establishment of Early Warning Technical Working Groups

Early Warning Technical Working Groups (EW-TWGs) may establish sub-groups or task-and-finish groups[13] to deal with specific technical or sectoral issues, for example, groups working on warning dissemination and communication; or to deal with sectoral issues related to specific hazards such as meteorology, hydrology, geology, health, or conflict.

13 Task-and-finish groups are established to carry out time-limited examinations of specific issues of interest or concern. This may include reviewing particular technical or sectoral proposals or decisions as well as giving inputs for the development of the Programme.

However, those sub-groups should always report back into the main EWS-TWG to ensure that issues and proposed solutions are understood by the entire group, and not dealt with in separate silos.

The relevant MHEWAS Coordinator will be responsible for the identification of stakeholders to be represented on the EW-TWG and for proposing the establishment of any sub-groups or task and finish committees. The precise terms of reference for each EW-TWG should be adapted to suit the existing context, structures, and environment in which they operate. However, the following generic roles and responsibilities should be included as a minimum.

3.5.1 Terms of Reference of the Early Warning Technical Working Groups

1. Provision of technical support for the delivery of the AMHEWAS Programme.
2. Provision of technical guidance and support for any sectoral Early Warning System or capacity building projects at their respective levels, identifying opportunities for collaboration and harmonisation.
3. Ensuring the effective dissemination and sharing of data and information relevant to Early Warning System provision between all relevant stakeholders.
4. Sharing advice, guidance, and information on potential external funding sources for MHEWAS capacity building and assisting MHEWAS Coordinators in sensitising decision makers on the benefits of effective early warning, including the potential return on investment that may be achieved.
5. Developing and maintaining operational guidelines for coordination between relevant stakeholders.
6. Developing protocols for development and activation of Early Actions.
7. Providing guidance and assistance for the establishment of MHEWAS Situation Room/ Facility at their respective levels.
8. Supervise the implementation and operationalisation of the MHEWAS Situation Room/Facility at each level once it is fully operational.
9. Ensuring the adequacy of SOPs and operational guidelines and ensure that these are tested and reviewed regularly.

In addition, the continental EW-TWG will be responsible for:

10. Assisting in the technical development of the MHEWAS Situation Room to ensure that it can support effective continental system.
11. Reviewing the long-term continental MHEWAS Model during Stage 2 of the AMHEWAS Programme and updating it with lessons learned.
12. Development of a Programme for implementation of the continental MHEWAS and provision of periodic reports and updates on progress toward that plan.

3.6 Coordination and Decision-making Meetings to Direct the AMHEWAS Programme

The AMHEWAS Programme requires extensive coordination between and among the various levels of governance structures as well as the varied stakeholders involved at the various stages of development and operation. The following is an indicative list of coordination and decision-making meetings that are likely to be required for an effective direction of the MHEWAS Programme

1. **Continental AMHEWAS Programme Development Conference (Programme Initiation)** – a Conference for multi-sectoral decision makers to formally adopt the AMHEWAS Framework and initiate the AMHEWAS Programme. The Conference will also allow Regional MHEWAS Coordinators to meet and receive guidance that will help develop regional MHEWAS arrangements. A concluding conference will be held to formally review and close the seven-year Continental Programme.
2. **Biannual AMHEWAS Summit aligned to the Africa Working Group on Disaster Risk Reduction (AWGDRR)** – A Summit to update decision makers on the AMHEWAS Programme and seek support for any proposed Programme amendments.
3. **Annual AMHEWAS Year-End Review Meetings** – The Continental MHEWAS Coordinator should meet with regional counterparts annually to discuss programme delivery and any apparent transboundary issues. At regional and MSs levels, one of the programmed EW-TWG meetings should be designated as an Annual Meeting, where progress on AMHEWAS Programme will be reviewed.
4. **Regional AMHEWAS Programme Workshop (three times per year)** – Regional workshops to be held virtually or in- person towards delivery of the AMHEWAS Programme by MSs and RECs. These will facilitate exchange of data and information between MSs within a region, and between MSs and regional counterparts. The workshops will provide an opportunity for MHEWAS Coordinators to meet and exchange experience, identify opportunities for collaboration and capacity building. These Regional MHEWAS meetings may be scheduled to coincide with seasonal changes to allow discussion of the upcoming season and any specific, emerging or expected, early warning challenges. One of the meetings will be designated as Annual Meeting for a formal programme review.

Chapter 4 | Continental MHEWAS Operational Model

4.1 Introduction

The single aim of the continental MHEWAS (i.e. AMHEWAS) operational Framework is to facilitate the saving of lives, protection of livelihoods and development gains, and the environment. It seeks to achieve this by ensuring that Early Warning Systems are in place to provide communities, responders, and governments with early warning of potential hazards, thus enabling them to reduce their exposure to hazards as far as possible by taking effective early action, thereby helping to prevent the many small emergencies from developing into full-blown disasters.

The process of issuing an effective early warning, even for a single hazard within a single Member State, presents several challenges. It requires effective coordination and data sharing between multiple Ministries, Departments and Agencies (MDAs) to ensure that separate Early Warning System components are developed and then fully integrated to ensure effective and timely warnings reach all those required to act. Member States are also committed to work toward a multi-hazard approach to early warning and risk assessment, adding complexity to system design. Delivery of a continental MHEWAS presents the same requirements and challenges, but on a much larger scale and with the additional challenge of facilitating coordination between MS, RECs, and continental levels. The AMHEWAS must also accommodate the impact of multiple hazards, recognise the potential for cascading impacts, and taking account of transboundary risks.

The development of an effective AMHEWAS Operational Model to mitigate the impacts of natural and human-induced disasters relies on the establishment of proactive, inter-agency coordination, with relevant stakeholders at local, national, regional, and continental levels and beyond. This requires the development of formalised structures to coordinate Early Warning System development across all Member States and RECs of the African Union Commission. Ultimately, the Operational Model must ensure that early warning information and advisories can be issued to all stakeholders who have a direct interest in receiving such information for timely decision-making and initiating effective Early Actions.

This chapter sets out a draft Operational Model for AMHEWAS delivery that can be used as a starting point for consideration of MHEWAS Coordinators and Early Warning Technical Working Groups. The seven-year AMHEWAS Development Programme describes how this initial draft model will be reviewed and revised with final recommendations proposed for decision at the end of Stage 2 (i.e. year 5) to take account of extended stakeholder engagement and developments in Years 1 through 5. Having approved a revised continental MHEWAS model at the end of Stage 2, piloting and practical operationalisation will be completed in Stage 3 (i.e. Years 5 through 7).

In recognition of the complexities involved, and the requirement for extensive stakeholder engagement before finalising long-term proposals, the proposed operational model for the delivery of AMHEWAS, set out below, incorporates two key principles :

1. **First,** the draft model does not propose replacement of existing sectoral, national, regional, or continental warning systems. Rather it proposes an overarching framework to encourage and support capacity building in those existing and sectoral Early Warning Systems, supported by effective exchange of data and information across sectoral and jurisdictional boundaries.
2. **Second, t**he draft model proposes enhanced coordination of warnings relating to transboundary and multi-hazard threats, establishing formalised structures for exchange of data and information across sectoral and jurisdictional boundaries in order to enhance the effectiveness of early warning and early action.

4.2 Enabling Environment for Operation of an Effective MHEWAS

A MHEWAS cannot operate in a vacuum; it needs to be developed within a broader and fully coordinated structure for disaster risk reduction and management. Although there are many issues that will need to be addressed in order to successfully operationalise AMHEWAS for the long term, this section sets out some of the key issues to be considered by EW-TWGs when developing those long-term plans and structures.

4.2.1 Steady Political and Financial Commitment

A steady political recognition of the benefits of a continental-wide standardised Multi-Hazard Early Warning System is required to ensure the success of such a system. This must be supported by enhanced harmonisation between sub-national, national, regional, and continental disaster risk management policies, planning and legislation.

AMHEWAS cannot be delivered without adequate and sustainable budgeting provision. Investment in anticipatory and predictive actions to reduce disaster risk, including in Early Warning Systems, can deliver good returns on investment. However, in many instances, disaster financing has been focused only on response and recovery, with limited funds available for anticipatory actions such as early warning.

This leads to a cycle of significant losses due to the disaster followed by significant costs to cover response and recovery. Tackling this dangerous and unproductive cycle of loss and encouraging investment in anticipatory actions such as early warning will require dependable political leadership and commitment.

4.2.2 Institutional Cohesion among all Early Warning Components

There should be strong institutional cohesion between and among all the bodies responsible for components of the EWS at national, regional, and continental levels. The following is a practical example of the need for institutional cohesion among all early warning components, when developing an Early Warning System for flooding at Member State level :

1. DRM and hydrological services will need to work with local government and communities to better understand flood risk and vulnerability. This is essential for development of impact-based warnings and in delivery of the Disaster Risk Knowledge component of an EWS.
2. Hydrological services may understand and monitor flood risk but will need to coordinate with Meteorological services and others, such

as hydroelectric dam operators, to receive advance warning of heavy rains or planned water releases that may lead to flooding. This is essential in delivery of detection, monitoring, analysis, and forecasting.

3. Once a flood warning is issued by hydrological services, they will need to liaise with multiple partners, primarily through DRM agencies and local governments, to ensure warning messages are effectively disseminated and communicated to those that need to act, especially to the vulnerable communities. This is essential in delivery of warning dissemination and communication.
4. DRM agencies and local governments will need to coordinate in the development of preparedness plans for flooding, and for the activation of early action plans when a warning is received. In doing so, they will need to involve communities, media and NGOs, and be advised by experts from hydrological services who can not only provide flood maps indicating areas most at risk but also identify areas safe from flooding that may be nominated for the establishment of emergency shelters. This is an essential component in preparedness and response capability

As illustrated in the above example, even for a single hazard warning system such as flooding, there are multiple stakeholders that need to be engaged and coordinated with in order to deliver an Early Warning System that can save lives and reduce losses by driving effective Early Actions. This simplified example is only intended to illustrate that no single sectoral agency or department can deliver an end-to-end warning system while working in isolation.

4.2.3 Clearly defined Roles and Responsibilities of all Stakeholders

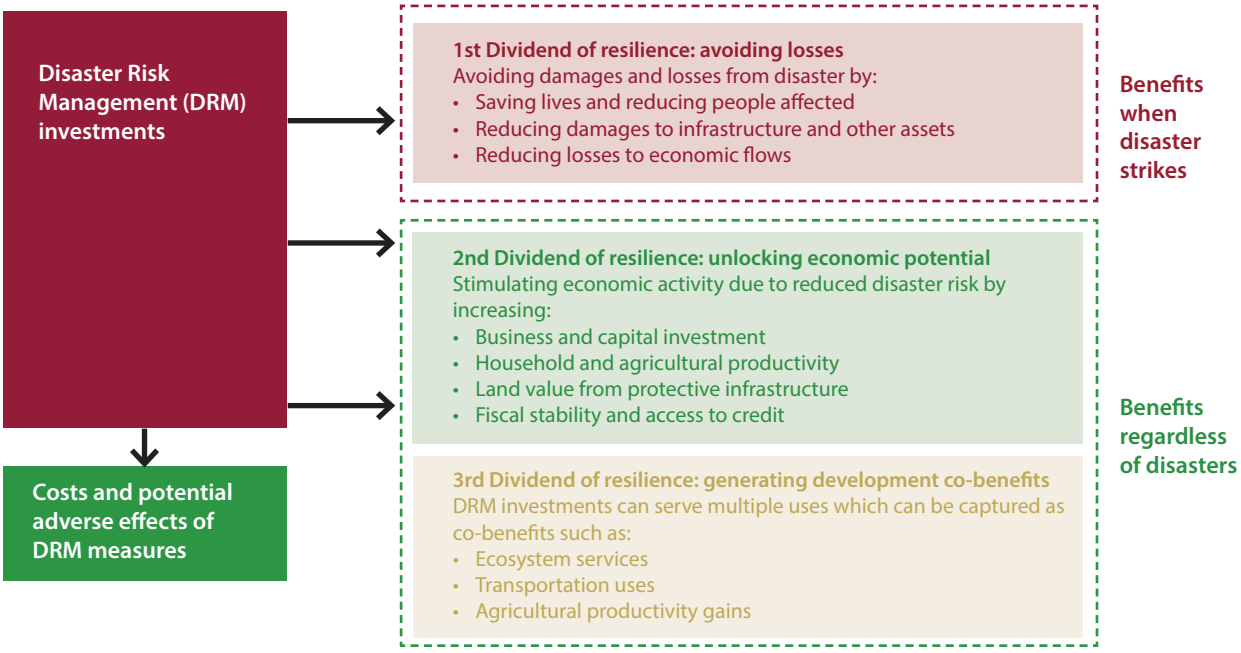
MHEWAS stakeholders, including local and impacted communities, must be identified well in advance and consensus reached on their respective roles and responsibilities within the MHEWAS structure. Coordination mechanisms for the various MHEWAS components should be clearly defined in legislation or Standard Operating Procedures (SOPs), which are agreed upon and followed by all concerned. The SOP must be well documented within continental, regional, national, and local plans, legislation, directives, and SOPs, including those of technical agencies such as national, regional, and continental DRM, health, meteorological and hydrological services.

4.2.4 Resource Allocation

MHEWAS reduce the costs and losses associated with disaster in addition to reducing human misery. However, they can only deliver these benefits if all the required warning system components are in place and adequately supported through allocation of required resources (e.g. human, financial, material, etc.). Investments into Early Warning Systems are, to a large extent, 'disaster-driven'.

This means that investments tend to increase significantly if a disaster strikes but are often quickly reduced in the following disaster-free years. Such sub-optimal investment patterns make the continuous operation, maintenance, and development of the early warning infrastructure a challenging task and may lead to disatisfactory and sub-par results.

Figure 7 : Examples of Benefits Delivered through Investment in Resilience (Source: Apergi et al., 2020)



Adequate financing of anticipatory actions to increase resilience delivers a range of benefits that ensure positive outcomes linked to the provision of and investments in Early Warning Systems. These positive outcomes, include three dividends' (Apergi et al., 2020): (a) allowing people to take precautions based on weather information received; (b) the reduction in disaster risk leading to a very small increase in investment by some in better motorboats and fishing gear (but these investments are not directly due to MHEWAS but an offer of subsidy from government); and (c) community engagement leading to improved governance and engagement of women thus building social capital and strengthening capacity of civil society to undertake disaster risk management. MHEWAS Coordinators and EW-TWGs must make a compelling business case for MHEWAS investment, supported by relevant facts and costs, and re-enforce this message with decision makers regularly. When doing so, they may refer to the wide range of benefits associated with functioning Early Warning Systems set out in the working paper to strengthen business case for MHEWAS investments. Some of these benefits are captured in Figure 7 above.

Each sectoral or MS warning system will have different investment requirements and priorities. Requirements at regional and continental level will differ further. Some examples of general areas that MHEWAS Coordinators and EW-TWGs might consider for investment in are set out below. These are indicative and are not intended to be an exhaustive list of all potential anticipatory activities and investments that may be required :

1. **Legal and Institutional Arrangements** – Review and strengthening of AMHEWAS legal and institutional arrangements through the analysis of policy instruments and institutional mechanisms.

2. **Identify Risk Information and Data Requirements** – Identify key users and providers of risk information and carry out a review of their data and information requirements, existing provision, and document gaps, if any. This should include clarification of technical standards and requirements for information and data exchange.
3. **Develop Capacity Building / Investment Plans** – Develop an integrated and multi-sector AMHEWAS Development and Investment Plan identifying all the Ministries, Departments and Agencies (MDAs) responsible for delivery of Early Warning System components, their current capacities and capabilities, and priorities for addressing any identified capability or capacity gaps.
   While each MDA may have their own sector development plan, capturing this information in an overarching AMHEWAS plan will enable prioritisation across sectoral boundaries and ensure that a functional, end-to-end, warning system is delivered.
4. **Warning Dissemination and Communication** – Evaluate warning communication and dissemination systems, through multiple communication channels, to ensure warnings reach all those required to act, including decision makers , seasonal populations, and those in remote locations. Develop appropriate protocols and SOPs to support warning communication and dissemination and the adoption of the Common Alerting Protocol (CAP). Identify and specify any dissemination equipment that may be required.
5. **Supporting Preparedness and Early Action** – Evaluate preparedness requirements to identify existing provision and gaps, if any. Establish standardised training materials for personnel responsible for delivery of MHEWAS components and undertake training and drills for those required to act, including decision makers and communities.

4.2.5 Risk mapping

Hazard, exposure, and vulnerability data and information, are used to carry out risk assessments used by several different sectoral agencies and partners, for different reasons, and at different levels. Multi-agency and multi-sector collaboration on this risk mapping exercise will not only improve the accuracy and utility of the results but will also reduce the cost and burden for governments and development partners. The sharing and integration of risk data and information between all AMHEWAS partners is essential in ensuring that appropriate impact- based warnings can be instigated, and that effective early action plans can be developed.

4.2.6 Ensuring warnings address the needs of those required to act

Warning messages should be impact-based, delivered in clear, consistent language and in a style which is well understood by authorities and local communities that are required to act. Warning messages should provide clear guidance to trigger reactions (e.g. evacuation) and consider the different risks and needs of sub-populations, including differential vulnerabilities (urban and rural, women and men, older people and youth, people with disabilities, etc.) All warnings should emanate from a single authoritative and officially recognised source to ensure they are credible and trusted by those required to act. The Common Alerting Protocol (CAP) has been designed to address many of these issues and should be adopted at all levels.

5.2.7 Accurate, timely, and effective warning and dissemination

Hazard Monitoring and Forecasting Services must have sufficient technical and human capacity to enable them to deliver accurate warnings at the geographical level for which they are responsible, i.e. sub-national, national, regional, or continental. Once hazard parameters have been breached, protocols must be in place to ensure warnings are issued without delay. The warning dissemination mechanisms must be designed to ensure that the warnings reach all those required to act, including concerned authorities, stakeholders, and vulnerable communities, in sufficient time for them to activate their early action plans. In the case of events with a short timeframe for reaction (e.g. flash floods or earthquakes), automated systems should be in place to mitigate impacts, (e.g. automatic stopping of transport via activation of red lights in tunnels, stopping elevators on the closest floor, opening of fire-truck gates, etc.)

4.2.8 Integration into response planning

Hazard, risk, and early warning information should be integrated into early action and emergency response plans and should consider the characteristics of exposure of the local communities (mainstreaming urban, rural, ethnic populations, tourists, and particularly vulnerable groups such as children, the elderly, the sick and those who are disabled).

The multi-hazard risk assessments underpinning AMHEWAS design can also be utilised to develop and design early action plans, such as evacuation strategies (e.g. identification of evacuation routes, demarcation of safe areas and location of temporary shelters, use of vertical evacuation etc.).

4.2.9 Early warnings mainstreamed in relevant public awareness and educational programmes

Training and sensitisation on AMHEWAS are essential to ensure that those required to act understand what they must do if a warning is issued. To assist in this, risk awareness, hazard recognition, and related emergency response actions should be mainstreamed within the formal and informal educational programmes; drills and simulations involving community members in at-risk communities should be conducted regularly to ensure operational readiness at all times.

4.2.10 Feedback

Effective feedback and after action review mechanisms should be developed at all levels to provide systematic evaluation of AMHEWAS performance to ensure the system is operating as planned and to identify any lessons learned to inform continuous improvement.

4.3 Operational Model for the Continental MHEWAS

4.3.1 Continental Roles and Responsibilities

The AMHEWAS Situation Room undertakes the following four key roles :

1. Provision of technical leadership, support, and direction for RECs and MSs on MHEWAS development and operation. In doing so, the AMHEWAS Situation Room will facilitate effective communication and data sharing between different sector stakeholders, and

between the AUC and international bodies such as the World Meteorological Organization.

2. Maintaining situational awareness at the continental level and facilitating early action. In doing so, the Situation Room will monitor hazard information and warnings issued at the MS and REC level, coordinate information sharing between RECs, and issue situational reports on hazard events for AUC bodies and decision makers .
3. Provision of continental warnings and facilitation of cross boundary exchanges of information between RECs to assist in evaluation of transboundary impacts or anticipated impacts arising from any hazard event.
4. Provision of ongoing natural hazard monitoring information and data to AUC bodies and decision makers during disaster response and recovery operations.

The provision of situational information and support provided by the AMHEWAS Situation Room will extend beyond early warning and early action. During any disaster response, the Situation Room will continue to coordinate and disseminate natural hazard related data and information and produce situation reports to inform decisions related to disaster response and early recovery.

The specific continental responsibilities related to individual MHEWAS components are included in Table 1.

In undertaking their role, the Situation Room will ensure that timely and authoritative warnings, data, and information is shared among all relevant decision makers and continental bodies, including all existing sectoral hazard monitoring bodies such as ACMAD, IGAD, Africa CDC, CCC, ARC and others.

4.3.2 Regional Level Roles and Responsibilities

The African Union Commission Executive Council at its 26th session, January 2015 [EX.CL/Dec.858 (XXVI)], requested the African Union Commission to facilitate the review of the Extended POA for the implementation of the Africa Regional Strategy on DRR. In its 30th session, January 2017 [EX.CL/Dec.943 (XXX)], the Council endorsed the Programme of Action (PoA) for the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 in Africa, and the Mauritius Declaration on the Implementation of the Sendai Framework in Africa. Adopting the MHEWAS Operational Model at regional level will assist RECs in delivering this obligation.

In order to deliver a permanent model for AMHEWAS beyond the seven-year Continental Programme, it is proposed that regions are tasked with provision of support for the harmonisation of Member State sectoral warning systems and the establishment of regional MHEWAS arrangements as part of their responsibility for regional mechanisms for early action and response. Some regions are already providing extensive support to MSs on early warning and early action. This includes establishment of formal DRR or hazard monitoring facilities by the REC, or collaboration with Regional Climate Centres operated by WMO. In relation to the issuing of warnings, the primary role of RECs is to ensure MHEWAS data and information is shared between MSs, especially in relation to any hazards that may present a risk of transboundary spread.

Table 1 : Continental Roles and Responsibilities for the Individual MHEWAS Components

Continental Level	
1. Disaster Risk Knowledge	1. Support RECs in their Risk Knowledge work
	2. Collate, aggregate, and disseminate continental risk information and mapping, working in collaboration with other continental facilities such as ACMAD, CEWS, Africa CDC, CCC, ARC and others
	3. Facilitate the development of standardised MHEWAS risk assessment approaches, mapping, and goals that may be adopted by RECs and MSs
	4. Facilitate international coordination and collaboration on risk mapping at the Continental level.
	5. Facilitate joint training and capacity building initiatives
2. Detection, Monitoring, Analysis and Forecasting of the Hazards and Possible Consequences	1. Coordinate monitoring, analysis, and forecasting systems for identified hazards at the continental level, working in collaboration with specialist hazard monitoring bodies such as ACMAD, CEWS, Africa CDC, CCC, ARC and others
	2. Establish Continental Warning Systems
	3. Ensure effective institutional mechanisms for hazard monitoring are in place at AUC level as well as supporting the effecttiveness of those in place at REC and MS level
3. Warning Dissemination and Communication	1. Establish organizational structures and decision-making processes for dissemination and communication of continental warnings
	2. Ensure communication systems and equipment are in place and operational, and that the Common Alerting Protocol (CAP) is adopted
	3. Ensure that impact-based warnings are communicated effectively to prompt action by decision-makers and target groups
	4. Establish feedback mechanism to assess the performance and skill on early warning information
4. Preparedness and response capabilities	1. Ensure that continental disaster preparedness measures, including response and Early Action plans, are developed and operational
	2. Ensure that continental public awareness and risk education campaigns are coordinated.
	3. Ensure that continental Early Action plans are tested and evaluated

Table 2 : Regional-level Roles and Responsibilities for the MHEWAS Components

Regional Level	
1. Disaster Risk Knowledge	1. Support MS in their risk knowledge work using a standardised methodology agreed at continental level
	2. Collate and disseminate regional risk information and mapping, especially relating to transboundary risks, working in collaboration with regional partners and bodies
	3. Facilitate international coordination and collaboration on risk mapping and development of cross border disaster scenarios at the regional level
	4. To provide ongoing hazard monitoring information and data to the Regional Disaster Coordination Centre (RDCC) during response and recovery operations
2. Detection, Monitoring, Analysis and Forecasting of the Hazards and Possible Consequences	1. Coordinate monitoring, analysis, and forecasting systems for identified hazards at the regional level, working in collaboration with regional bodies such as Climate Centres
	2. Establish Regional Warning Systems
	3. Establish hazard monitoring and forecasting arrangements at the REC level and monitor those that have been established at MS level to ensure that they are effective and operational
3. Warning Dissemination and Communication	1. Establish organizational structures and decision-making processes fordissemination and communication of warnings
	2. Ensure communication systems and equipment are in place and operational, and that the Common Alerting Protocol (CAP) is adopted
	3. Ensure that impact-based warnings are communicated effectively to prompt action by decision makers and target groups
	4. Establish feedback mechanism to assess the performance and skill on early warning information
4. Preparedness and response capabilities	1. Ensure that regional disaster preparedness measures, including response and early action plans, are developed and operational
	2. Ensure that regional public awareness and risk education campaigns are developed, coordinated, and delivered
	3. Ensure that regional early action plans are tested and evaluated
	4. Ensure MHEWAS data and analysis can be made available to inform regional responses coordinated at the Regional Disaster CoordinationCentre (RDCC)
5. Governance and Institutional Arrangements	1. Early warning secured as a long-term regional priority and those financial benefits and return on investment that may be delivered through MHEWAS understood by decision makers
	2. Ensure that legal and policy frameworks to support early warning are adequate or propose revisions
	3. Institutional capacities assessed and enhanced

Table 3 : Member State-level Roles and Responsibilities for the MHEWAS Components

Member State Level	
1. Disaster Risk Knowledge	1. Carry out hazard, vulnerability and risk assessments and engage local or vulnerable communities in the process according to standardised methodology agreed at continental level
	2. Assess exposure, vulnerabilities, and risks – keeping track of historical events
	3. Consolidate risk information and mapping
	4. Incorporate risk information into the Early Warning System to support development of impact-based warnings and early action plans
	5. Assessment and quantification of exposed people and assets
2. Detection, Monitoring, Analysis and Forecasting of the Hazards and Possible Consequences	1. Establish National and Sub-National monitoring, analysis, and forecasting systems for identifying hazards
	2. Ensure institutional mechanisms are in place to support coordinated hazard detection, monitoring, analysis, and forecasting
	3. Establish warning and alert systems
3. Warning Dissemination and Communication	1. Establish organizational structures and decision-making processes fordissemination and communication of warnings
	2. Ensure communication systems and equipment are in place and operational, and that the Common Alerting Protocol (CAP) is adopted
	3. Ensure communication systems and equipment including last mile connectivity to ensure warnings achieve last mile connectivity forvulnerable groups
	4. Produce communication and public awareness tools. These should include various communication products such as newsletters, fact sheets,radio and television programmes, radio dramas, movies, and websites
4. Preparedness and response capabilities	1. Ensure that disaster preparedness measures, including response and early action plans, are developed and operational
	2. Ensure that public awareness and education campaigns are conducted
	3. Ensure that public awareness and early action plans are tested and evaluated
	4. Ensure MHEWAS data and analysis can be made available to inform national and sub-national disaster responses
	5. Organise regular exercises undertaken to test and optimise the effectiveness of early warning dissemination processes, preparedness and response to warnings
5. Governance and Institutional Arrangements	1. Early warning secured as a long-term national and sub-national priority
	2. Comprehensive legal and policy frameworks to support early warning are established
	3. Institutional capacities for MHEWAS components are assessed andenhanced

The MHEWAS facilities established at regional level can support MSs in the provision of early warnings and can trigger a regional warning for hazards striking, or threatening to strike and impact, more than one MS within the REC. Regional MHEWAS facilities will also provide hazard monitoring information to the Regional Disaster Coordination Centre to assist in the coordination of disaster response and recovery operations.

The regional-level responsibilities related to individual MHEWAS components are included in Table 2 below. RECs will liaise with the continental level when hazards are identified that could present,a transboundary risk and impacts and ensure effective information exchange between regions.

4.3.3 Member State Level Roles and Responsibilities

Member States have the primary responsibility for identifying and monitoring hazards, issuing warnings, and initiating early action. When reviewing their MHEWAS legal and institutional arrangements, MSs should ensure that all four elements required for a warning system are developed, harmonised, and coordinated at national and sub-national level. Warnings issued by MSs need to be timely, localised, granular and impact-based, in order to facilitate effective early action. Localised sub-national warnings need to be monitored at National level to identify the risk of spread that could lead to a requirement to initiate warnings in other parts of the country.

Ultimately, national warnings covering large parts of a country may be required, and where hazards present a risk of transboundary impact with neighbouring countries, national MHEWAS facilities must coordinate with their regional counterparts to ensure effective coordination of warnings and the sharing of data and information with other impacted or potentially impacted Member States.

It is important that Member States engage local or vulnerable communities in design and delivery of the warning systems they will benefit from. The Member State's responsibilities related to individual MHEWAS components are included in Table 3 above.

4.3.4 AMHEWAS Warning Tiers

Warnings are issued at multiple levels and aimed at diverse population groups and end users. To ensure a robust coordination, a classification system has been adopted within the AMHEWAS operational model. Based on the potential geographical spread and consequences of the event for which warning is being issued, four tiers of warning within the continental system have been identified.

The continental warning tier system recognises that most early warnings will be routine local alerts issued by relevant agencies within a MSs at the sub-national level. These warnings will primarily relate to localised hazards impacting specific local communities.

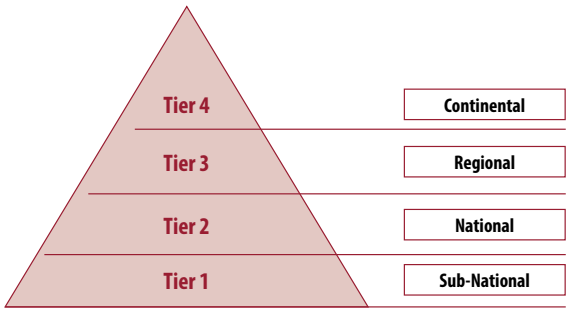
Other warnings issued at MS level may have national significance due to the likely impact of the event, or its likely geographical scale. In these instances, Member States' MHEWAS facilities will need to monitor hazards and issue warnings to multiple sub-national areas.

Disasters do not respect jurisdictional boundaries, and some hazard events may have transboundary

impacts. In these instances, warnings and warning information needs to be coordinated between MSs at regional level.

A small number of events, such as pandemic or drought, may present the risk of transboundary spread between regions, necessitating the coordination of warning information at the continental level. In recognition of these four functional levels of warning, the continental-level AMHEWAS establishes four warning tiers. At Member State level, the local tier of warning may be delivered through several technical systems or further subdivided with the addition of community-based warning systems to meet the specific context and circumstances of the country. However, for the purpose of the AMHEWAS Operational Model, this local or sub-national, tier is considered as a single entity, and it is a matter for MSs to determine the precise operational arrangements for sub-national warnings. A schematic diagram is included below.

Figure 8 : Schematic Diagram of the AMHEWAS



Tier 1 – Sub-national Early Warnings issued for routine events triggered by the national or local MHEWAS facility on the advice of hazard-monitoring services, local or community-based early warning service and local knowledge of communities. Warnings are targeted at specific local communities or localised geographical areas within a Member State. These warnings are for relatively low-impact routine events which can be managed by communities and local authorities with no major risk of escalation that would require triggering of warnings nationally.

Tier 2 – National Early Warnings triggered at the MHEWAS facility by the national hazard monitoring services for significant events impacting, or with the potential to impact, multiple administrative areas within the country, or more localised events that have the potential for very significant consequences and require national attention for hazard monitoring and forecasting. Level 2 warnings are issued for serious and widespread national emergencies. Once a National Warning is issued, the National MHEWAS Facility will ensure all hazard and warning information, along with situation reports, is shared and disseminated to impacted jurisdictions and local governments.

Tier 3 – Regional Transboundary Early Warning is issued when the REC identifies the potential for significant transboundary impacts, or anticipated impacts, from a single hazard event being monitored and MS would require international assistance. Regional Warnings may be issued to all impacted, or potentially impacted, Member States. Once a Regional Warning is issued, the Regional MHEWAS Situation Room or facility will ensure all hazard and warning information, along with situation reports, is shared, and disseminated to impacted MSs as well as the continental level.

Tier 4 – Continental Early Warning is issued through the AMHEWAS Situation Room for the most significant events requiring, or potentially requiring, continental- level coordination of warning information.

For example, warnings are issued:

1. Where a significant hazard impacts, or has the potential to impact, multiple RECs
2. Where a significant hazard results, or has the potential to result, in significant consequences for a MS or REC
3. Where a significant hazard requires the coordination of hazard monitoring support for MSs or RECs at the continental level

Once a continental-level warning is issued, the AMHEWAS Situation Room will ensure all hazard and warning information, along with situation reports relating to those hazards, is shared and disseminated to decision makers , the AUC, international bodies, and the Regional Economic Communities.

4.3.5 Mapping of AMHEWAS Delivery Partners

A range of potential stakeholders and delivery partners will need to be engaged in delivery of the AMHEWAS Framework. Some critical partners will need to be engaged and involved in AMHEWAS development and operation. At the continental level, this engagement may be achieved through bilateral and multi-lateral discussions between AUC and partner bodies.

Technical engagement on Early Warning Systems during the AMHEWAS Delivery Plan is facilitated through Early Warning Technical Working Groups (EW-TWG) as described in Chapter 3, with groups established at continental, regional and Member States levels. Each of these technical groups will be responsible for identification of the full list of relevant partners or partner organizations that should be represented. For example, at national and sub-national level, stakeholders may include local government and departments or agencies responsible for Hydromet, DRR, health, conflict, food security, and DRR coordination.

At the regional level, the same departments, or agencies responsible for hydromet, DRR, health, conflict, food security, and DRR coordination may be included, in addition to the Regional Climate Centres where appropriate.

4.4 Operationalising the Continental Model for MHEWAS

At continental level, stakeholders representing AMHEWAS, ACMAD, A-CDC, CEWS will be joined by representatives from other AUC Departments as required. International organizations may be represented and contribute at all levels, with contributions from WMO, UNDRR, WHO, UNHCR, FAO and many others.

The Technical Working Groups and decision-making structures, set out in Chapter 3, will establish the Delivery Plan for operationalisation of the continental MHEWAS. During the interim (years 1 through 5 period these groups will review, revise, and update the proposals set out below.

It is envisaged that different elements of the continental MHEWAS will – taking into account the existing structures and opportunities for progress as they arise – develop at different times within a single programme of development.

Where elements required to support the long-term functioning of a continental MHEWAS can be developed more quickly, for example, establishment of a continental, regional, and Member State MHEWAS coordination functions,

they may be put in place to assist in the further development of remaining components.

Several required components of the continental MHEWAS already exist and the work of existing international, AU, regional and Member States bodies should not be duplicated in the process of developing a continental MHEWAS; for example, the work of the African Centre of Meteorological Application for Development (ACMAD), Continental Early Warning System (CEWS) and African Centres for Disease Control and Prevention (Africa CDC) amongst others.

4.4.1 Supporting AMHEWAS Development at AUC Level

It is important that a single department or unit is authorised to coordinate delivery of the Africa Multi-Hazard Early Warning and Action System (AMHEWAS). It is proposed that the AUC should give authority to the Department of Agriculture, Rural Development, Blue Economy and Sustainable Development (DARBE).

DARBE may task the continental DRR Unit with responsibility for coordinating the seven-year AMHEWAS Programme. During the seven-year AMHEWAS Programme, the Situation Room of the DRR Unit will take responsibility for delivery of the continental responsibilities and for coordination of the continental tier of early warning for natural hazards working in close collaboration with continental hazard monitoring bodies.

Proposals for the coordination of the continental-level AMHEWAS beyond the seven-year AMHEWAS Development Programme will be developed by the continental EW-TWG in years one to five of the AMHEWAS Programme. Those proposals will be presented to the annual continental MHEWAS meeting for endorsement prior to being submitted to the AUC for a decision.

4.4.2 Coordination and Technical Groups

It is proposed that the MHEWAS Coordinators and Early Warning Technical Working Groups (EW- TWG) established to lead the development of MHEWAS during the seven-year AMHEWAS Development Programme should be maintained beyond year seven as permanent structures to assist in MHEWAS ongoing review, development, and maintenance.

In the first instance, it is recommended that the DARBE appoints a Continental MHEWAS Coordinator who shall act as the strategic focal point for MHEWAS at continental level. The Continental MHEWAS Coordinator may be a full-time staff role, with consideration to the appointment or nomination of a deputy and communications expert to assist them. It is important that the selected individual should have sufficient authority and experience to enable them to liaise and coordinate effectively with stakeholders at national, regional, continental, and international levels. They will support the Chair of the Continental Early Warning Technical Working Group (EW-TWG, mandated to offer technical guidance AUC. They will also meet with the Chairs of Regional EW-TWGs, to ensure effective communication, coordination, and collaboration between the regional and continental tiers.

It is proposed that AUC appoints the Continental EW-TWG Chair, who will be supported by the Continental MHEWAS Coordinator. EW- TWG members should be appointed from the various

continental and international departments and agencies involved in assessing risk, monitoring hazards, and issuing Early Warnings.

The Continental EW-TWG may establish subgroups to lead or work on matters relating to specific technical disciplines or working to support warnings for sectoral hazards, such as hydrology, meteorology, or health. The EW-TWG will act as advisory body to the AMHEWAS Situation Room once it is fully operational.

The primary objectives of all EW-TWGs will be to develop and maintain operational guidelines and SOPs for coordination of early warning information and delivery between relevant stakeholders. The EW-TWG will also be responsible to ensure the adequacy of the SOPs and operational guidelines and ensure that these are tested and reviewed regularly. It is suggested that the Continental EW-TWG will be established with a multi-agency and multi- sector membership. In addition to standing members of EW-TWG, the chairperson may invite any additional members to advise the group on a specific matter or contribute to the work of a sub- group.

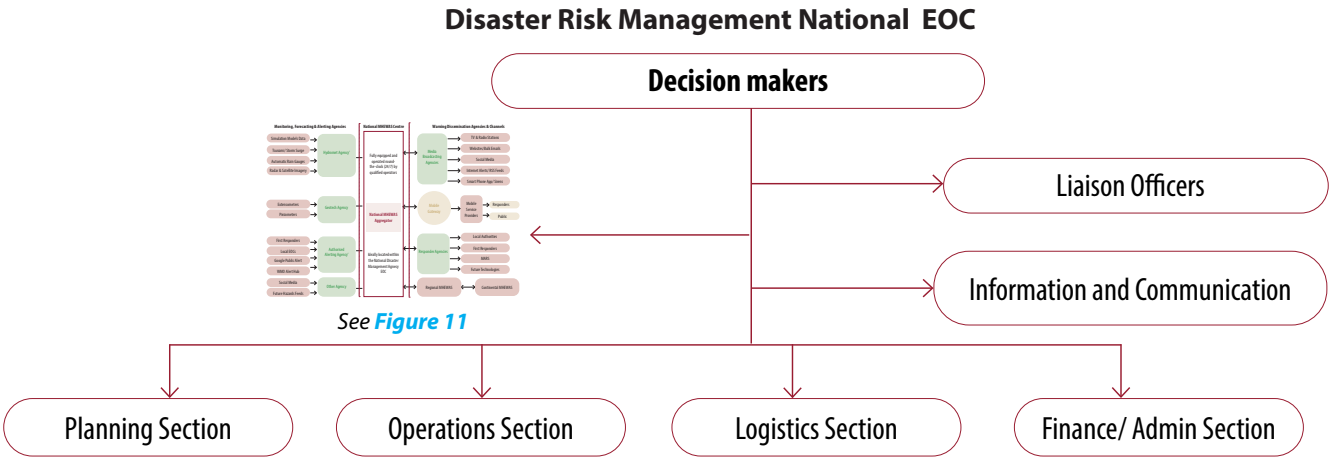
4.5 Setting up of Round-the-clock (24/7) MHEWAS Situation Rooms

MHEWAS Situation Room functions may be defined as facilities established at continental, regional and Member States levels for the purpose of coordinating and aggregating data and information relating to multi-hazard early warning and early action. MHEWAS Situation Rooms coordinate the multi-agency and multi-sector exchange of data and information required to issue Early Warnings at their own respective level. Formalised linkages between the MHEWAS Situation Rooms at continental, regional and Member States levels also creates a network to facilitate the formalised exchange of warnings and data connecting the sub-national to continental levels.

This networked approach will improve the accuracy and utility of warnings, ensuring more effective early actions can be taken. It will also help to identify and address transboundary risk issues and encourage better partnerships and data exchange, which will reduce system operating costs. Although the term 'Situation Room' has been adopted to describe the MHEWAS function, this does not require construction and staffing of entirely new facilities at MSs and RECs levels where there may already be existing units or facilities available around-the-clock (24/7) that could take responsibility for the function. At the continental level, it is recommended that the AMHEWAS Situation Room established by AUC/DARBE takes responsibility as the Continental MHEWAS Situation Room during the seven-year AMHEWAS Programme.

A permanent arrangement for the Continental MHEWAS Situation Room beyond the seven-year Programme will be considered and proposals put forward for consideration at the conclusion of Stage 2 (i.e. Year 5) of the AMHEWAS Development Programme. Both short- and long- term coordination of AMHEWAS at continental level is essential to ensure that data and information from multiple sources, in respect of multiple hazards, are effectively monitored so that information can be aggregated, and warnings and situation reports issued to relevant AUC Departments and decision makers.

Figure 9 : Illustrative Structure of MHEWAS within an EOC Facility at Member State Level



While it is a matter for RECs and MSs to determine structures for MHEWAS operation at their respective levels, it is noted that most MSs and many RECs have arrangements to establish Emergency Operations Centres (EOCs), either at a purpose-built EOC facility or by bringing together relevant stakeholders at some other location under the direction of a Disaster Management Agency (DMA) or similar body. Where this is the case, the most efficient way of introducing the MHEWAS Situation Room function may be to extend the remit of the EOC/DMA to include responsibility for the MHEWAS Situation Room function.

The added advantage of this approach is that co-location of the MHEWAS and EOC facilities will make it easier to integrate information provided through hazard monitoring systems for warning and early action into systems developed for disaster response and recovery operations. Whatever structures are adopted for MHEWAS Situation Room facilities at RECs and MSs levels, they should fall under the authority and leadership of a single Ministry, Department or Agency and be clearly defined in regional and Member State laws, decisions, and policies.

The incorporation of MHEWAS Situation Room responsibilities into existing or future EOCs managed by DRR units or agencies presents several advantages. They will support preparedness through the coordination of multi-agency and multi-sector information and data sharing, providing hazard data and mapping to inform response planning and community risk sensitisation.

Having triggered timely early warnings and initiating early action, the hazard data monitoring provided by the MHEWAS Situation Room can continue to inform response and recovery efforts through the ongoing provision of hazard information, forecasts, and nowcasts.

4.5.1 Training and Capacity Building

Although technical hazard monitoring remains the task of existing specialist bodies such as ACMAD

and CEWS at the continental level, and National Meteorological and Hydrological Services at Member State level, the MHEWAS Situation Room will be responsible for monitoring all specialist information that is provided to them and ensuring it is aggregated and disseminated in accordance with their SOPs and operational guidelines.

Staff from the MHEWAS Situation Room will therefore require training to enable them to understand the information and data they will be monitoring, understand who requires the information and in what format, and can follow their SOPs and operational guidelines to initiate early warnings and early actions.

An initial task in establishing the AMHEWAS Situation Room will be to conduct a training need analysis and develop an appropriate training programme both for the initial acquisition of knowledge and skills necessary for the effective running of the AMHEWAS Situation Room, and for the ongoing maintenance of those skills, incorporating any lessons learned once the facility is operational.

A key continental contribution to the delivery of MHEWAS is to support RECs and MS in training and capacity building. To assist in building institutional capacity, and not just personal competence, it may be useful to develop standardised continental training and assessment packages, working with competence centres and universities that may also be able to provide accreditation and validation of training delivered.

4.5.2 Establishment of Working Arrangements at/among International, Continental, and Regional Levels

To enable the Continental MHEWAS to function effectively, all concerned stakeholders need to be actively engaged and come to an agreement on how each will fulfill their role in the system.

An early task for the EW-TWG will be to identify relevant stakeholders at continental level and work with them to formulate a draft MoU, SOP or other guidance document that captures the agreed roles, responsibilities and ways of working agreed by the group.

The EW-TWG should also liaise with counterparts at REC and MSs levels to develop similar MoU, SOP and guidance documents that set out the relationship between MHEWAS at the continental, RECs and Member States levels. The MHEWAS Coordinators at each level should liaise with strategic counterparts and decision makers to ensure the working arrangements are formally adopted, while the EW-TWG establish the precise nature of the formalised arrangements at respective levels. At minimum, these should include arrangements to regulate the sharing and use of data, information, and observations, and the sharing of Early Warning System developments and good practices.

These working arrangements should ensure that data provided through information-gathering structures (national DRR platforms) are validated by all sectors before being shared with the regional social structure. They will also ensure that any new technical developments or lessons learned in one sector, such as monitoring of meteorological or hydrological events, can be shared with all other sectors and hazard monitoring agencies so that consideration may be given to adopting those lessons more widely.

Working arrangements developed by EW TWGs should also set out the structures and processes used to for dissemination and communication of early warning messages through the various platforms hosted by partner agencies, such as websites, RSS feeds, emails, social media platforms, and applications designed to run on mobile devices.

The objective of formal working arrangements is to enhance the effectiveness of all sectoral warning systems to reduce losses through more timely and effective early actions.

The overall goal is to ensure that all early warning information can be aggregated and then disseminated automatically through multiple and diverse platforms to reach the maximum number of stakeholders.

4.6 Operational Guidelines and SOPs for the Continental MHEWAS Situation Room

Critical SOPs need to be developed at national, regional, and continental levels to facilitate interoperability among different situations rooms. This should set out the a simple demarcation of responsibilities among the different teams or facilities defined by the phase of any event. Responsibility for actions taken before a hazard event impacts, including triggering of early action plans (such as the precautionary activation of the Disaster Coordination Centre for Response and Recovery), rest with the AMHEWAS Situation Room. Actions taken after a hazard has impacted will be directed by the Disaster Coordination Centre/EOC responsible for coordinating disaster response and recovery. It is not the role of the Early Warning System to direct those operations as this requires an entirely different set of information and capabilities.

While the MHEWAS Situation Room will not lead disaster response and recovery operations, once an event has impacted and response is underway, the regional facility will continue to provide hazard forecasts and other information to the Disaster Coordination Centre/EOC so that planners and decision makers have access to the best available hazard information. The relative roles and responsibilities of the two functions, including arrangements for communication and coordination, should be clearly established in the SOP. Information and guidance on the AMHEWAS Situation Room is set out in Annexure 2.

This provides a starting point for AMHEWAS development, and the role and contribution of the Situation Room will be continually developed by AUC, supported by the Continental EW-TWG, in years 1 through 5 of the Programme to take into account lessons learned once the AMHEWAS Programme commences.

In year 5 of the Programme, AUC/DARBE and the Continental EW-TWG will propose permanent arrangements for the AMHEWAS Situation Room beyond the seven-year Programme.

Further trials and piloting of those arrangements may be undertaken in years six and seven, with any final revisions being proposed at the end of the Programme to take account of lessons learned.

This section sets out considerations for the development of comprehensive guidance for operation of the AMHEWAS Situation Room

Table 4 : MHEWAS Warning Tier Activation Criteria

Level	Criteria for activation	Continental Level Action
Level 1	1. Very localized Sub-National Warning triggered by National EWS Service or community based EWS targeting specific geographical areas within a MS 2. Warnings issued for relatively low impact, routine, events which can be managed by local authorities or communities with no major risk of escalation or transboundary spread	• No action required • General monitoring by Situation Room
Level 2	1. National warning triggered by National MHEWAS facility for significant events which may escalate, impacting/ potential to impact multiple administrative areas within MS or more localized events with potential of very significant consequences which requires national hazard monitoring and forecasting	• No formal action required • General monitoring by Situation Room and provision of advice or guidance on request
Level 3	1. Regional Warning triggered when the REC MHEWAS Situation Room identifies the potential for significant transboundary impacts/ anticipated impacts even from a single hazard event affected more than one MS; this may be triggered by information received from regional hazard monitoring services, or from information received from a MS 2. Regional Warning may be issued to all impacted/ potentially impacted MSs within same REC. Where neighbouring MSs from another REC may be impacted, transboundary warnings may be issued through the Continental MHEWS Situation Room	• Partial activation of the Situation Room. • Monitor the situation with the REC • Evaluate the situation and escalate to Level 4 Warning if required • Issue Situation Reports to impacted REC Situation Rooms to monitor the situation • Inform so that they may initiate preemptive early actions as required
Level 4	1. Continental Warning issued by the AMHEWAS Situation Room for the most significant events that have resulted, or may result, in regional transboundary impacts 2. Warnings for significant hazards with potential for continental impacts, affecting multiple MSs and RECs with significant consequences	• Full activation of the Situation Room to coordinate information from multiple sources, liaison with RECs on transboundary impacts or anticipated impacts • If a disaster occurs, ensure data and information on hazards being monitored continues to be provided to the Continental Disaster Coordination Centre

Table 5 : Colour Codes for the AMHEWAS Tiers

Tier	Level	Colour
1	Local / Subnational	Green
2	National	Yellow
3	Regional	Amber
4	Continenal	Red

beyond the seven-year AMHEWAS Programme, although it may also inform operation of the AMHEWAS Situation Room during the seven-year AMHEWAS Programme. Tables 4 and 5 include the criteria for the activation of AMHEWAS warning tiers, the classification levels, as well as standardised colour codes.

4.6.1 Communication and dissemination arrangements

A critical requirement of the continental MHEWAS is to ensure the effective communication and dissemination of information required for early warning across sectoral and jurisdictional boundaries. Adoption of an integrated information system over multiple scales for improving availability and accessibility to risk and early warning information is critical to delivery of this objective. Users should only need to input information and data into the system once, and the system should be so configured as to allow other authorised users to immediately access that information.

The *Road Map for Improving the Availability, Access and Use of Disaster Risk Information for early warning and early action, including in the Context of Transboundary Risk Management* (UNDRR 2020) provides an excellent starting point for this work and should be used as a reference by EW-TWGs.

Rapid access to reliable real-time information is fundamental for the decision-making process before and during an emergency. A shared web-based Geographic Information System (GIS) platform, with an accessible database would enable different user profiles (forecasters, disaster managers, decision makers) to access information in real-time.

Communication and dissemination of warnings, including information on Early Actions, is also required. Even where shared web-based, GIS platforms have been adopted, protocols for the exchange of information and data and for coordination of early warning and early action messages, including permissions to view and amend data, should be clearly established operational guidelines and SOPs.

Ensuring that SOPs and other operational documents are jointly developed with the support of all the directly related agencies based on their mandates and capabilities will greatly enhance their utility and chances of success. When developing proposals for long-term communication and dissemination arrangements, EW-TWGs should engage stakeholders from each sectoral and jurisdictional agency responsible for MHEWAS components.

Communication and dissemination arrangements must be designed to ensure that warnings are received by all those required to act. Key questions relating to dissemination and communication of early warning information can be found in the 2017 MHEWS Checklist. These are set out below for information :

1. Are organizational and decision-making processes in place and operational?

- Functions, roles, and responsibilities of each actor in the warning dissemination process enforced through Government policy or legislation at all levels and included in the standard operating procedures
- Warning communication strategies at the continental, regional, national, sub-national,

and local levels in place that ensure coordination across warning issuers and dissemination channels
- Regular coordination, planning and review meetings between the warning issuers, the media, and other stakeholders
- Professional and volunteer networks established to receive and disseminate warnings widely
- Feedback mechanisms in place to verify that warnings have been received and to correct potential failures in dissemination and communication
- Mechanisms to update the information are in place and are resilient to the event

2. Are communication systems and equipment in place and operational?

- Are communication and dissemination systems tailored to the different needs of specific groups (urban and rural populations, women and men, older people and youth, people with disabilities, etc.)
- Understanding of last-mile connectivity to know which population groups can be reached by different services, including mobile-cellular, satellite and radio services
- Warning communication and dissemination systems reach the entire population, including seasonal populations and those in remote locations, through multiple communication channels (e.g. satellite and mobile-cellular networks, social media, website, flags, sirens, bells, public address systems, door-to-door visits, community meetings, etc.)
- Communication strategies evaluated to ensure messages reach all categories of population
- Agreements developed to utilise private sector resources where appropriate (e.g. mobile-cellular, satellite, television, radio broadcasting, amateur radio, social media,) to disseminate warnings. Equipment maintained and upgraded to utilise new technologies, thus ensuring interoperability
- Backup systems and processes in place in the event of failure resilience of communication channels and Early Warning System hardware evaluated in advance to reduce the impact of events on the infrastructure
- Coverage of communication channels and multiple-channel systems assessed to identify gaps and possible points of failure that may increase vulnerability

3. Are impact-based early warnings communicated effectively to prompt action by target groups?

- Warning messages provide clear guidance to trigger reactions (e.g. evacuation)
- In the case of events with a short time frame for reaction (e.g. earthquake early warning), automated systems should be in place to mitigate impacts (e.g. automatic stopping of transport, activation of red lights in tunnels, stopping elevators on the closest floor, opening of fire-truck gates)
- Early warnings should consider the different risks and needs of sub-populations, including vulnerabilities (urban and rural populations, gender, age i.e. older people and the youth, people with disabilities)
- Public and other stakeholders are aware of authorities issuing warnings and trust their message

4.6.2 Continental Warning Activation Levels and Criteria

The primary role of the Continental MHEWAS is to ensure that Member States and sectoral warnings are coordinated, and any transboundary early warning issues are identified and addressed effectively. To assist in this, four levels of warning are set out for sub-national, national, regional, and continental levels.

The general criteria applicable for triggering each of the four AMHEWAS warning tiers, and the actions allocated to the continental level, is set out at Table 4 earlier. EW-TWGs may, during the seven-year AMHEWAS Programme, develop further and more detailed criterion and actions applicable for triggering the warnings.

4.6.3 Overview of the Architecture for the Continental MHEWAS

Delivery of the AMHEWAS is achieved through coordination of early warnings for multiple hazards at three distinct levels: continental, regional and Member States. MHEWAS Situation Rooms established at each of those levels coordinate warnings and information at their respective level and communicate with each other to provide a continental warning and communication network.

The AMHEWAS Situation Room must have the capability to coordinate, aggregate, and disseminate, warning data and information emanating from the various continental hazard monitoring and warning services, as well as the information provided by MHEWAS Situation Rooms at REC and MS levels. MHEWAS Situation Room functions at REC and MS level undertake similar duties at their respective levels, linking multi-sectoral and multi-disciplinary agencies together to form a single and unified warning system.

The MHEWAS Situation Room functions established at MSs, RECs and continental levels provide the architecture upon which the Continental MHEWAS is based. Over the seven-year AMHEWAS Development Programme the Situation Room network will be piloted and expanded, and existing Early Warning Systems incorporated.

The proposed architecture for the continental MHEWAS provides a network approach that is not intended to replace existing bilateral communication arrangements, but rather is intended to enhance them through robust communication and coordination policies thus facilitating better data and information sharing in near real-time between and among all stakeholders. The network approach is intended as a two way, rather than top-down structure thus facilitating that data and information sharing can be achieved through multiple channels in order to make the process more responsive and reliable.

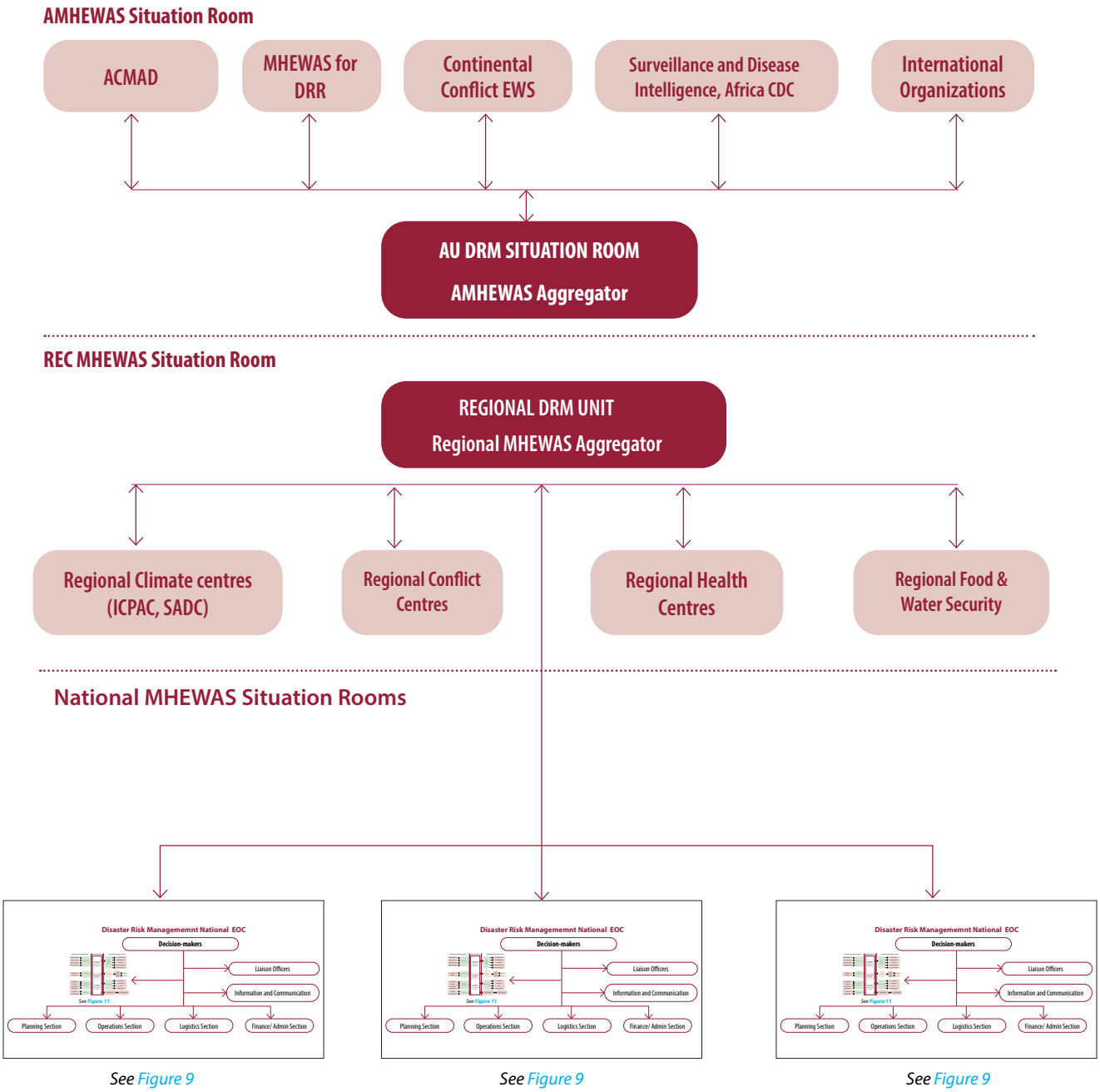
For example, climate data and information sharing is provided in both directions from national to regional to continental to international bodies and back.

Early Warning Systems need to exchange information and data in real time, so development and use of common information platforms and Disaster Management Information Systems (DMIS) at MSs, RECs and continental levels is a priority. This allows data and information input to the system at one level to be instantly available

to other authorised users elsewhere without the need to generate further reports or information returns.

This will facilitate the instantaneous sharing of data and information and ensure common situational awareness at all levels, and across all sector partners. For example, if several Member States are dealing with a major flood event, the information they input to their own DMIS or emanating from their hazard monitoring system will not only determine their own early warnings and Early Actions but will automatically inform the REC MHEWAS Situation Room about conditions so that they can consider issuing a regional warning should potential transboundary impacts

Figure 10 : Proposed Architecture for AMHEWAS Linking MSs, RECs, and Continental Levels



See Figure 9 *See Figure 9* *See Figure 9*

be identified. Similarly, the Continental MHEWAS Situation Room can monitor the situation at regional level and determine whether continental warning of transboundary impacts needs to be issued to neighbouring RECs.

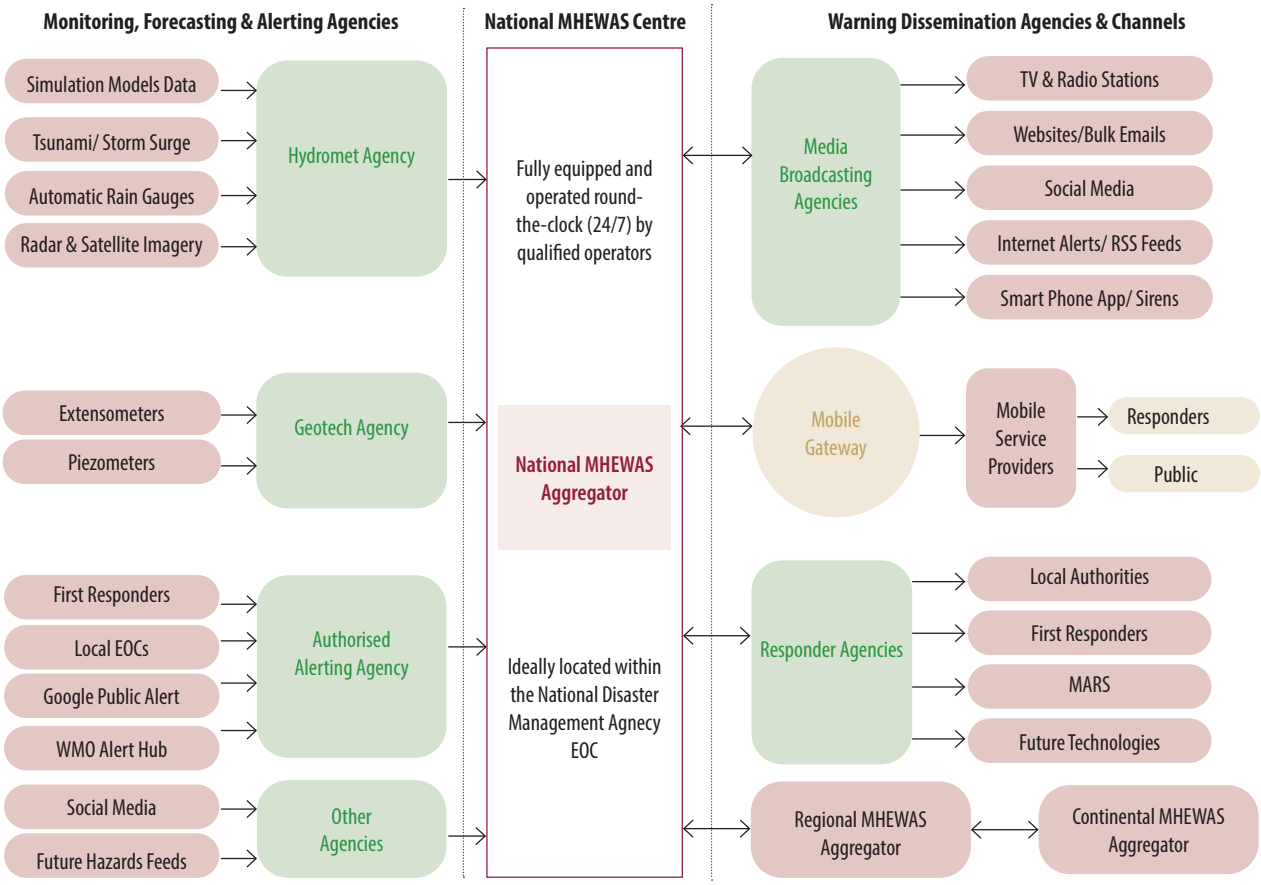
4.7 Recommendations for Operationalisation of the AMHEWAS Model for RECs and MSs

A general schematic of the networked MHEWAS facilities at MSs, RECs and continental levels, along with an illustrative list of coordination stakeholders at each level, is encapsulated in Figure 10.

The different functions identified in the figure are intended as an exemplification and should not be considered as a mandatory indication or constraint to RECs or MSs that might have already identified a different function according to their needs. The draft model proposes MHEWAS roles and responsibilities for individual RECs and MSs to consider and suggests ways in which their responsibilities under the continental MHEWAS may be delivered.

However, it is a matter for individual RECs and MSs to determine how they wish to operationalise MHEWAS at their respective levels. The proposed Member States model presented in Figure 11 recognises that there are a range of monitoring, forecasting, and alerting agencies, each working toward their sectoral mandate and providing information and warnings. The agencies listed in the proposed model relate primarily to natural hazards and are intended to only be illustrative.

Figure 11 : Illustrative Long-Term MHEWAS Structure for Member States



Some MSs may not have all those listed agencies, yet others may have additional agencies that could be included.

The single MHEWAS system and coordination architecture is intended to be flexible and adaptive over time, so that regardless of the type of hazard being monitored or agency initiating warning messages, it can be expanded to support all early warnings in the future.

In the proposed model, all warning information and data generated by monitoring, forecasting, and alerting agencies is shared with a AMHEWAS Situation Room that will aggregate the information and then disseminate warnings as required through multiple warning dissemination agencies and channels.

MHEWAS Situation Rooms also provide a focal point for communication and dissemination of warning data and information between the MSs, RECs, and continental levels, thus helping to address transboundary risks and warning issues.

It is recommended that RECs and MSs consider the general guidance and model structures proposed and then contextualise and adapt them to meet their own specific circumstances. Although there are operational advantages in adopting common structures, as long as they can meet their obligations within the continental system for provision of hazard data and information and for the sharing of warning information, RECs and MSs may put in place such structures and arrangements as they see fit.

Further guidance on how those structures will be operationalised is set out below.

4.7.1 Establishment of Regional and National MHEWAS Lead Agency

Although the specific arrangements may differ in each MS and REC, many have established sectoral Ministries, Departments and Agencies (MDAs) with primary responsibility for hazard monitoring and warning, such as national meteorology, hydrology, or health agencies. They have also established a range of MDAs responsible for DRR or civil protection and emergency planning at local, MS, or regional levels. However, a challenge observed in many MSs and RECs, is that no single MDA has overall responsibility for coordination of all warning system elements to ensure that an effective and end-to-end system is delivered.

The AMHEWAS Framework proposes that while the role of sectoral hazard monitoring or DRM MDAs is unchanged, there are operational benefits in giving a single MDA overall responsibility for coordination of the various partners responsible for delivery of separate Early Warning System elements. This coordinating MDA will also be responsible for establishment of the MHEWAS Situation Room, where warning messages can be aggregated and disseminated effectively, and to provide a formal link and single point-of-contact for exchange of warning data, information and messages between MSs, RECs, and continental levels.

Where there is no single ministry, department, agency (MDA) with existing responsibility for coordination of MHEWAS partners, MSs and RECs must consider and determine the most appropriate MDA to undertake this responsibility. Given the multi- hazard nature of the continental warning system, regional DRR Units or National

Disaster Management or Civil Protection Agencies are well placed to undertake this coordination responsibility.

Appointment of MDAs in charge of disaster risk reduction to coordinate MHEWAS will enable RECs and MSs to utilise any existing Emergency Operations or Disaster Management Centres to undertake additional responsibilities of a Situation Room. Regardless of which body is appointed to coordinate MHEWAS at RECs or MSs levels, they should be granted sufficient authority to ensure they can convene all necessary sectoral stakeholders involved in delivery of MHEWAS components.

At Member State's level, this includes stakeholders at national and sub-national levels, including local governments and all sectoral hazard monitoring services. At REC's level, sectoral stakeholders include any regional hazard monitoring organizations, such as Regional Climate Centres and representatives of relevant international bodies.

The MHEWAS' responsibility for establishing a Situation Room includes arrangements to receive and aggregate hazard monitoring and warning information from specialised agencies and then disseminating warnings via multiple channels to those required to act, including decision makers, other government departments, responders, and the public. The MHEWAS Situation Rooms in Member States will liaise and share data and information with their counterparts at regional level, and through them, to the continental level.

The arrangements for delivery of the seven-year AMHEWAS Development Programme, including the appointment of MHEWAS Coordinators and establishment of EW-TWGs, are set out in Chapter 3 of this document. It is proposed that these structures for governance and coordination of the AMHEWAS Development Programme are retained and incorporated into the permanent arrangements for delivery of MHEWAS at REC and MS level.

4.7.2 Appointment of MHEWAS Coordinators and Early Warning Technical Working Groups

This section supplements information provided in Chapter 3, providing additional considerations for design of permanent arrangements for AMHEWAS delivery.

It is recommended that each REC and MS retain a coordinator responsible for MHEWAS beyond the seven-year AMHEWAS Development Programme and make this a permanent position. Their permanent role will be to act as the strategic focal person for ongoing AMHEWAS review, development, and operation at their respective level, and to coordinate with all concerned stakeholders including national, regional, and continental bodies responsible for MHEWAS.

The Coordinator does not need to be a full-time staff role, but the selected individual should have sufficient seniority and authority to act as the liaison representative of the REC or MS. Coordinators should ideally be based at the REC headquarters or a Member State's national department and be familiar with all Member States and regional partners, including Climate Service Centres. Coordinators should also be appointed as Chair of Early Warning Technical Working Groups (EW-TWG) for their respective levels.

Similarly, it is recommended that each REC and MS maintain an Early Warning Technical Working Group (EW-TWG with responsibility to provide technical and coordination support for ongoing MHEWAS review, development, and operation at their respective level. EW-TWG members should include representatives from all relevant DRR, hazard monitoring and associated agencies, including, where appropriate, from academic institutions. The EW-TWG will act as the permanent advisory body to REC or MS MHEWAS Situation Room.

The key role for the EW-TWGs is to assist in continual evaluation and improvement of MHEWAS, and for identifying opportunities to enhance early warning and build capacity through enhanced data and information sharing and partnerships across sectoral boundaries. EW-TWGs will also review and develop operational guidelines and SOPs for coordination between relevant stakeholders and ensure they are formally adopted and implemented by the relevant agencies in MSs or RECs. The EW-TWG at the levels of MS and REC will also be responsible for routine updates and maintenance of SOPs and operational guidelines and for ensuring they are tested and reviewed regularly.

4.7.3 Establishment of SOPs between Regional Stakeholders and Member States

To enable the continental MHEWAS to function effectively, an appropriate Memorandum of Understanding (MoU between and among all concerned stakeholders at RECs, and MSs levels is required. Development of these SOPs will be an early task for the relevant REC and MS EW-TWGs during the seven-year AMHEWAS Programme.

Beyond the seven-year AMHEWAS Development Programme, there will be a requirement to review and maintain those SOPs to ensure they are fit for purpose and are delivering anticipated benefits. It is recognised that during the seven-year AMHEWAS Development Programme, requirements for additional or amended SOPs to support permanent arrangements for MHEWAS may be identified.

The EW-TWG will establish the precise nature of permanent SOPs, but, as a minimum, they should include arrangements to regulate the sharing and use of data, information, and observations, and the sharing of Early Warning System developments and good practices. This is to ensure that any new technical developments or lessons learned in one sector can be shared with all other sectors and hazard monitoring agencies to facilitate a wider adoption of lessons learned.

SOPs developed to regulate permanent arrangements for AMHEWAS should also set out the structures and processes used to for dissemination and communication of early warning messages through the various platforms hosted by partner agencies, such as their Information and Communication Technology (ICT) systems, websites, RSS feeds, emails, social media platforms, and applications designed to run on mobile devices.

Ultimately, the goal is to ensure that all early warning information can be aggregated and then disseminated automatically through multiple and diverse platforms to reach the maximum number of stakeholders. Where they are not already included within a single facility, an SOP will be required to avoid confusion and duplication between the functions of MHEWAS Situation

Rooms and any Disaster Coordination Centre or EOC responsible for coordinating disaster response and recovery. This SOP should set out the simple demarcation of responsibilities between the two facilities defined by the phase of any event and clearly establish communication and coordination arrangements between them. In general, responsibility for actions taken before a hazard event impacts, including triggering of early action plans rest with the MHEWAS Situation Room – such as the precautionary mobilisation of resources or activation of the Disaster Coordination Centre or EOC on a precautionary basis – should response and recovery coordination become necessary. Actions taken after a hazard has impacted will be directed by the Disaster Coordination Centre or EOC.

Once disaster response and recovery operations are underway, the MHEWAS Situation Room will continue to provide hazard forecasts and other information to the Disaster Coordination Centre or EOC so that planners and decision makers have access to the best available hazard information. Where the MHEWAS Situation room is established within a Disaster Coordination Centre or EOC, this liaison and integration will obviously be easier than if the two facilities were established as separate and independent entities.

4.7.4 MHEWAS Sensitisation, Simulation, Drills, and Exercises

Permanent arrangements for MHEWAS should set out responsibilities for sensitisation, simulations, drills, and exercises. The objective is to ensure that all those required to act in response to an early warning, including government agencies and communities, are sensitized to the risks they face and trained to understand and follow instructions issued in early warning messages.

This forms part of Component 4, in the development of preparedness and response capabilities.

Key actors in design and delivery of simulation drills and exercises include national and local disaster management agencies; scientific and technical agencies (such as meteorological and hydrological organizations, health authorities, ocean-observing organizations, and geophysical agencies; military and civil authorities; humanitarian and relief organizations (e.g. National Red Cross and Red Crescent Societies); schools; universities; informal education sector; media such as television, radio and social media; businesses/ public facilities (e.g. tourism, healthcare facilities, and marine vessels); non-governmental organizations, community-based and grassroots organizations; international and United Nations agencies.

EW-TWGs may support those activities and should regularly review their effectiveness. Responsibility for training programmes and community sensitisation generally rest with NDMAs, local government, and communities. EW-TWGs should liaise with those agencies to ensure that their drills and exercises include MHEWAS.

Chapter 5 | A Way Forward for the Delivery of the AMHEWAS Framework

5.1 Background

The AMHEWAS Programme serves as the first step towards the operationalisation of the Framework. The continental MHEWAS will be developed as a Programme over a seven-year period and is broken down into three distinct stages, with actions taken at continental, regional, and Member States levels. Briefly, the three stages are:

- **Stage 1 :** The first two (2) years makeup the *start-up phase,* which commences with the establishment of the coordination structure in the form of the MHEWAS Coordinators and Early Warning Technical Working Groups (EW-TWGs) at MSs, RECs and continental levels. The priority in the first two years being to raise awareness among and sensitise decision makers and to start work on supporting capacity building for existing sectoral Early Warning Systems.
- **Stage 2 :** The next three (3) years are the *development stage* which includes continued development and capacity building for sectoral warning systems, and review and revision of proposals for long-term AMHEWAS coordination structures considering lessons learned during the first stage. At the end of this stage and before commencing work for the next, revised proposals for long-term delivery of AMHEWAS will be submitted to the decision makers for endorsement.
- **Stage 3 :** The third and final stage is a further two (2) years of *piloting and delivery of the AMHEWAS*. This stage is expected to involve adoption of necessary supporting legal and institutional arrangements, the development of SOPs and operational plans, and piloting of the continental warning system - commencing with at least one REC and two MSs with AUC providing coordination.

At the conclusion of the seven-year Programme, an evaluation of the progress will be undertaken, and proposals on permanent arrangements for maintenance of AMHEWAS beyond the initial period of the Development Programme submitted to the decision makers .

5.2 Delivering the Continental MHEWAS Programme

An overview of the AMHEWAS Programme is set out in Chapter 3 and illustrated in Figure 4. The diagram captures 22 key activities that are designed to contribute toward the delivery of five outputs and specific objectives, addressed through the seven-year AMHEWAS Programme.

The five outputs are:

1. Establishment of the continental MHEWAS Programme
2. Establishment of common protocols and platforms for sharing data and risk information
3. Enhancement of round-the-clock (24/7) hazard monitoring and warning services
4. Delivery of functional end-to-end warning dissemination and communication systems, including the vital 'last mile' connectivity
5. Development of protocols and materials for preparedness, including planning and training

Following the formal initiation of the seven-year Programme, the MHEWAS Coordinators and EW-TWGs (at continental, regional, and Member States levels), setup as a first action towards the realisation of the AMHEWAS, will need to develop a detailed programme and project plans for their respective areas of responsibility.

An indicative delivery schedule for the Programme, laying out what can be done over a span of seven years is presented in Annexure 3. It provides an index of activities, associated list of indicators, along with the responsible parties as well as budget estimates for the different activities. The delivery of the Programme includes activities like, the organization of the continental summit by the AUC in the first year; preparation of multi-hazard early action plans, by the AUC with support from TWGs, in years three and four; sensitisation of decision makers through development of materials and briefings across the seven years, undertaken by the AUC as well as the MHEWAS coordinators; etc. Illustrative budget estimates, based on a set of assumptions and cost, have also been provided for all activities.

Thus, the Framework, in delivery of these outputs and objectives, will guide the Member States, as well as the other actors at different levels, to move towards achieving the target of having early warning available to everyone by 2030. This will be a significant step towards the achievement of that longer term objective of the AUC and to the achieve of the Sendai Framework Targets.

5.3 Key Considerations for AMHEWAS Framework Implementation

It is acknowledged that the development of a continental MHEWAS is a long-term process that will require extensive stakeholder engagement and sufficient flexibility to allow the Programme to adapt to further developments in early warning technology and lessons learned from the engagement process.

5.3.1 Tasks Aiding Rapid Delivery

Keeping in mind AU's commitment to deliver MHEWAS by 2030, the Programme sets out the proposed timelines for the various activities based on current understanding. However, as a general principle, any opportunity to improve existing Early Warning Systems or to deliver the continental MHEWAS Programme more quickly should be taken. The EW-TWGs and decision makers may choose to enact elements of the Programme as soon as circumstances allow. Tasks that can be brought forward for more rapid delivery should be reported to decision makers and the Programme plan amended accordingly. These will ensure its accelerated delivery.

5.3.2 Lessons Informing the Subsequent Phases

Arranging the AMHEWAS Programme in three stages, each with a formal reporting and decision-making process, provides opportunities for decision makers to review progress and revise proposals at each stage before authorising the next. This provides an important opportunity for lessons learnt to inform the subsequent phases of the Programme.

For example, the development and the operationalisation of the AMHEWAS Situation Room during Stage 1 will not only assist in coordination of natural hazard early warnings but will also aid the development of continental MHEWAS and provide practical lessons to be incorporated into later stages of the Programme. However, the key challenge, in the early years of

the Programme, is expected to be around delivery of capacity building and training necessary to support the subsequent stages of the programme. The translation of best practices and learnings to actual plans and activities with specific indicators will not only be used for sensitisation but is also expected to inform the actual development of project plans and activities.

As the Programme goes on, the structures of coordination, decision-making, and implementation will undoubtedly acquire expertise and skills that will prove to be an asset for the ensuing implementation. Thus, the experience gained from the delivery of this Programme will contribute towards enhanced development of the subsequent stages of the Programme.

5.3.3 Evolution of Technology

The AMHEWAS Programme will need to incorporate and reflect not only on lessons learnt, but also follow technological developments in the field of multi-hazard assessments, early warning, and early action systems.

This could include an expansion of indicators around technological hazards – like industrial pollution, nuclear radiation, toxic wastes, dam failures, transportation accidents, factory explosions, fires, and chemical spills – and innovations and development on the technological front.

The specific segments of the Programme will need to be aware of and responsive to accommodate the new developments in warning system technology as well as experience gained during the delivery of the Programme.

5.3.4 Different Starting Points

It is recognised that all MSs and RECs will be commencing the MHEWAS development process from a different starting point, and that some may be able to make much quicker progress than others. Depending upon where the countries are, in the different stages of having a multi-hazard early warning system which is capable to initiating early action, the implementation of the programme will be varied. The path taken and results achieved, by the stakeholders as well as the countries, will depend upon not only on available capacities but also the opportunities that can be leveraged, either individually or as a consortium.

Thus, an immediate priority for MHEWAS Coordinators and EW-TWG will be to contextualise the programme to meet specific local needs. Wherever possible, the terms of reference of existing coordination structures, working groups, and committees may be adapted to enable them to support delivery of MHEWAS without the need to establish new and additional groups and structures, thus assimilating them into the AMHEWAS effort.

It is also recognised that in the majority of MSs and RECs, there will be significant training and capacity building needs, along with a need to sensitise decision makers on the contributions made by the AMHEWAS.

This sensitisation and capacity building will be important throughout the seven-year Programme, but it needs to be a special priority in the first years. Hence the need to explore of opportunities to share the burden of this work by working in partnership within RECs and with the assistance of international organizations.

5.3.5 Regular Exchange of Learning and Experience

While the Programme acts as the first step in framing the overall approach and provides the initial impetus to move forward towards the availability of MHEWAS to everyone, it is important to have a process in place that not only ensures its implementation but also provides a platform for a regular exchange of leanings and experiences. The platform will then inform stakeholders across different levels while also providing a forum for communication and learning from one another.

The AUC, with its mandate to bring together different stakeholders in various forums, is eminently suited for playing the role of the convener. There are many opportunities laid out in the Programme that can become the vehicle for such interventions.

The first such opportunity within the Programme being the Continental AMHEWAS Programme Development Conference, hosted by AUC, which is expected to provide the decision makers with an opportunity to put together a way forward and give formal approval for initiation of the Programme, appointment of MHEWAS Coordinators, and the establishment of EW-TWGs.

The proposed annual AMHEWAS review meetings of MHEWAS Coordinators will monitor progress on delivery of the agreed Programme. Aligned with the Africa Working Group on Disaster Risk Reduction (AWGDRR), a biannual AMHEWAS Summit is also proposed. The Summit, organised by the AUC, will provide an opportunity to update key decision makers on the AMHEWAS Programme and seek support for any proposed Programme amendments.

5.3.6 MHEWAS Coordinators and TWGs

In providing for the appointment of the MHEWAS Coordinators and Early Warning Technical Working Groups (EW-TWGs), as one of the first steps, the Framework itself provides the first step of guidance in the operationalisation of the seven-year programme. Thus, the Coordinators and the EW-TWGs (at continental, regional, and Member States levels) become the body where the way forwards are assessed, plans reviewed and revised, detailed programmes and project plans for their respective areas of responsibility developed, and a series of actionable documents provided to the decision makers .

The first task of the MHEWAS Coordinators and EW-TWGs will be to review and design a way forward, and to produce the first draft delivery programmes at their respective levels, adding further layers of detail and addressing local priorities. Finalised and agreed delivery plans at MS and REC level should be shared with the continental level so that a consolidated continental-level delivery plan can be arranged. The AMHEWAS Programme sets out indicative actions (at the continental, regional, and Member States level) intended to provide the AUC and the relevant EW-TWGs with a starting point in their work for producing more detailed AMHEWAS Programme Plans.

The MHEWAS Coordinators and TWGs are necessary and important cogs in the wheel of the AMHEWAS Programme. As these two critical coordination structures help to direct and monitor AMHEWAS delivery during the seven-year AMHEWAS Development Programme, they have the capacity and ability to quickly assess the emerging needs as well as upcoming trends, alter the way forward and develop the plans

accordingly, thus assimilating the learnings and experiences in the upcoming actions, as the Programme moves froward from one step to the other.

5.4 Conclusion

A significant challenge to achieving the **Agenda 2063 : The Africa We Want** is the continuing occurrence of disasters, which erode development progress and hold or push people back into poverty.

Establishing an effective MHEWAS in the continent is not only critical to mitigating such disaster risks and saving lives, but increasing the access to MHEWAS and disaster risk information by 2030 is also a key objective of the Sendai Framework and the PoA for Africa.

The AMHEWAS Framework thus aims to outline systems, processes, and the various actors engaged in monitoring natural hazards, conflicts, and biological and other shocks. While guiding the institutional mechanisms for better data sharing and collaboration across national borders, the AMHEWAS will be complemented by corresponding initiatives including, the establishment of Situation Rooms at the continental and regional levels.

The Framework will be used as guidance from AUC to regional organizations, and national governments, to further strengthen early warning and early action systems. This Framework Document along with the Policy Brief will serve as effective tools for advocacy on disaster risk reduction in Africa and contribute to the African Union's political commitment to strengthening multi-hazard early warning and early action systems.

Establishing a continent-wide MHEWAS will facilitate efficient early warnings and early actions; contribute to protecting lives, livelihoods and development gains; and provide opportunities for resilient risk-informed development, thus contributing to attaining the Agenda 2063. It marks the beginning of the journey towards AU's vision to have a fully-fledged AMHEWAS by 2030.

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List of Annexures

Annexure I – Binding and Non-binding Instruments Creating the Conditions for a Functioning Continental MHEWAS

The AMHEWAS Institutional Framework has been anchored on legislative, policy or framework structures and institutional arrangements presented in the Preamble of the document. The listed decisions and resolutions established the African Centre of Meteorological Applications for Development (ACMAD) monitoring meteorological events, the Continental Early Warning System Monitoring Conflict, and Africa Centre for Disease Control and Prevention (Africa CDC) monitoring health-related threats, such as infectious disease. A similar structure of specialist bodies and agencies operate their early warning system functions at REC and MS levels..

The establishment of an effective early warning systems has been a goal of the African Union Commission since the adoption of the Programme of Action for the Implementation of the Africa Regional Strategy for Disaster Risk Reduction ARSDRR (2006-2015). The Sendai Framework for Disaster Risk Reduction 2015-2030 provides the opportunity to focus disaster risk management (DRM) on implementation of the new global framework for disaster risk reduction (DRR)

In Africa, based on a revised Programme for Action (PoA) that strengthens efforts to increase resilience which will drive poverty reduction, sustainable development in line with Sustainable Development Goals (SDGs), Agenda 2063 and other development frameworks and processes.

The African Union Commission Executive Council endorsed the Programme of Action (PoA) for the Implementation of Sendai Framework for Disaster Risk Reduction 2015-2030.

Experiences in other parts of the world demonstrate that an effective early warning mechanism can enable preparedness and resilience of different sectors and systems to withstand extreme weather phenomena. There are two principles that can be applied to the continent-wide multi-hazard early warning and early action system: the principles of (a) subsidiarity, and (b) proportionality. The first one stating that continental-level decisions should be taken if the local ones are less effective and the latter prescribing that the actions at the continental level should not transgress the objectives of the AUC.

The Assembly of the Union, having regard in particular Article 8 to the Constitutive Act of the African Union Commission, has adopted Rules of Procedure that, in Rule 4, lay down powers and functions that shall be performed by the Assembly.

The Assembly can apply the following powers and functions in the establishment of the AMHEWAS:

- Determine the common policies of the Union, establish its priorities, and adopt its annual programme;

- Monitor the implementation of policies and decisions of the Union as well as ensure compliance by all Member States through appropriate mechanisms;

- Give directives to the Executive Council, the PSC or the Commission on the management of conflicts, wars, acts of terrorism, emergency situations and the restoration of peace;

- Determine the sanctions to be imposed on any Member State for non-payment of assessed contributions, violation of the principles enshrined in the Constitutive Act and these rules, non-compliance with the decisions of the Union and unconstitutional changes of government;

- Adopt the budget of the Union, oversee and direct the financial matters of the Union in accordance with the Financial Rules and Regulations of the Union;

- Establish any other organ of the Union;

- Establish such specialised agencies, *ad hoc* committees and commissions, and temporary working groups, as it may deem necessary

RULE 34 - Categorization of Decisions – stipulates that Decisions of the Assembly shall be issued in the following forms:

Regulations: these are applicable in all Member States which shall take all necessary measures to implement them;

Directives: these are addressed to any or all Member States, to undertakings or to individuals. They bind Member States to the objectives to be achieved while leaving national authorities with power to determine the form and the means to be used for their implementation;

Recommendations and Declarations, Resolutions: these are not binding and are intended to guide and harmonise the viewpoints of Member States.

The non-implementation of Regulations and Directives shall attract appropriate sanctions in accordance with Article 23 and 30 of the Constitutive Act.

RULE 35 - Implementation of Regulations and Directives – stipulates that Regulations and Directives adopted by the African Assembly are binding on Member States, Organs of the Union and RECs and that they are enforceable thirty (30) days after the date of the publication in the Official Journal of the African Union Commission or as specified in the decision.

RULE 36 - The Assembly shall determine, on the basis of recommendations of the Executive Council and the PRC, as well as information provided by the Commission, sanctions to be imposed under Article 23 (1) of the Constitutive Act.

RULE 37 - Sanctions for Non-compliance with Decisions and Policies – defines that " the Assembly shall approve, upon the recommendation of the Executive Council, the imposition of sanctions under Article 23 (2) of the Constitutive Act on a Member State that fails, without good and reasonable cause, to comply with the decisions and policies of the Union.

Providing a clear legal, policy, and institutional basis for delivery of MHEWAS at continental, regional and Member States levels is essential to underpin long-term political and financial commitment to the systems, and to ensure that they are delivered in such a way as to be mutually supportive in order to maximise the accuracy and timeliness of warnings generated.

Having in mind the legal and policy documents presented in the preamble of the framework, the table below provides an overview of regulations, directives, or recommendations inform of

proposals, on the previously outlined four elements of the early warning system, that should ensure that legal and policy frameworks to support early warning are established and envisage mechanisms and structures for coordination and integration of organs and technical specialised offices of the African Union Commission, Regional Economic Communities, and Member States in order to deliver a continental multi-hazard early warning and early action system.

Some of the instruments would require formal binding regulations and directives but some others non- binding recommendations and guidelines.

The criteria that have been applied to determine the status of an instrument – hard law or soft law – are based on the Rule 34 of the Rules of Procedures.The selection of instruments that should cover categories of each of the four elements of the MHEWAS depend on the fact whether:

- They are supposed to be applicable and enforceable in all MS simultaneously without mediation into national law

- The adaptation of the national legislation should be performed by leaving the RECs and MS the option to choose the form to achieve a particular objective acknowledging that MS have different legal traditions, processes, and terminology, or

- A non-binding act without legal force can guide the process of establishment or modification of certain standardised processes and legislation of importance for the functioning of the mutli-hazard early warning and early action system.

Indicative AMHEWAS Programme Roles and Responsibilities

MHEWAS COMPONENT	Action	African Union Commission (AUC)	Regional Economic Community (REC)	Member State (MS)[1]
Disaster risk knowledge	Multi-hazard risk assessment (hazard, vulnerability, exposure, coping capacity) and mapping for disaster management	AUC multi-hazard risk assessment and mapping recommendations for disaster management comprising disaster risk management terminology	REC specific multi- hazard risk assessment and mapping recommendations for disaster management	Disaster management legislation stipulating the country specific multi-hazard risk assessment and mapping methodology
	Disaster loss data collection	AUC recording and sharing disaster damage and loss data recommendations	REC specific recording and sharing disaster damage and loss data recommendations	Disaster management legislation stipulating the country specific recording and sharing disaster damage and loss data
	Hazard specific risk knowledge	AUC hazard specific directives (flood, fire, drought, disease, storm etc.)	REC hazard specific directives (flood, fire, drought, disease, storm etc.)	Transposition of the hazard specific directives into domestic legislation
	Spatial planning	AUC directive on establishing the infrastructure for spatial information	REC specific decision on establishing the infrastructure for spatial information	Transposition of the directive on establishing an infrastructure for spatial information into domestic legislation
	Critical infrastructure	AUC directive on identification and designation of critical infrastructures and the assessment of the need to improve their protection	REC directive on identification and designation of critical infrastructures and the assessment of the need to improve their protection	Transposition of the directive on identification and designation of critical infrastructures and the assessment of the need to improve their protection into domestic legislation
	Training centre of excellence	AUC directive on the establishment of the AMHEWAS training centre of excellence using academic curricula and programmes for training of personnel of all relevant stakeholders of the MHEWAS supporting MS academic institutions and research centres	REC directive on the contribution and support of the AMHEWAS training centre of excellence	MS legislation stating the contribution and support of the AMHEWAS training centre of excellence
	Open source MHEWAS data platform	AUC directive on the establishment of the continental MHEWAS situation room run open data MHEWAS platform based on signed MoUs by relevant stakeholders for the sake of free access to early warning information on natural hazards and exchange of data and products necessary for the provision of MHEWAS services in support of the protection of life and property and the well-being of all AUC nations	REC directive to the contribution of the continental MHEWAS situation room run open data MHEWAS platform	MS DRM law provisions of the EOC contribution and support to the continental MHEWAS situation room run open data MHEWAS platform
	Financing mechanism	AUC directive on the MHEWAS financing mechanism to support the created infrastructure	REC directive on the MHEWAS financing mechanism to support the created infrastructure	MS DRM government decision on the financing mechanism to support the created infrastructure

1 In establishing their MHEWAS legal and institutional arrangements, MSs must ensure that all four elements required for a warning system are developed, harmonised, and coordinated at national and sub-national level

MHEWAS COMPONENT	Action	African Union Commission (AUC)	Regional Economic Community (REC)	Member State (MS)
Detection, monitoring, analysis and forecasting of the hazards and possible consequences	Detection, monitoring and forecasting data exchange	AUC directive on the establishment of the continental MHEWAS situation room able to gather timely MHEWAS information to support decisions to be made by the AUC and AU organs. The decision describes the continental coordination function including roles, responsibilities of relevant institutions and agencies and procedures linking alerts and warnings to actions flowing from the continental to the regional and the national level in case of dangerous events approaching and unfolding	REC directive on the establishment of MHEWAS situation room able to gather and exchange timely MHEWAS information to issue alerts to support decisions to be made by the RECs and MSs	MS DRM law provisions that define that the National DRM Agency or EOC receives and integrates all relevant MHEWAS information required to issue warnings and provide a single source of information to support decisions to be made by the government, citizens and disaster management authorities at different levels of government. MS sectoral legislation establishing Hazard Monitoring Services, such as Meteorology, Hydrology, or Health should be consistent with the overarching DRM law to avoid duplication or confusion around roles and responsibilities within the end-to-end warning system
		AUC recommendation on the management structure and qualification of staff of the: continental MHEWAS situation room, REC MHEWAS situation room, national EOC, NHMS, DRM institutions etc.	REC recommendations on the management structure and qualification of staff of the: REC MHEWAS situation room, national EOC, NHMS, DRM institutions etc.	Disaster management authorities at different levels of government, MS sectoral legislation establishing Hazard Monitoring Services, such as Meteorology, Hydrology, or Health should be consistent with the overarching DRM law to avoid duplication or confusion around roles and responsibilities within the end-to-end warning system
		AUC recommendation on the optimal hazard monitoring observation and monitoring network design and technical equipment	REC specific recommendations on the optimal hazard monitoring observation and monitoring network design and technical equipment	Incorporation of the recommendations on the optimal hazard monitoring observation and monitoring network design and technical equipment into government concepts and decisions
		AUC recommendations on development of operational hydrological modelling for flood and flash flood forecasting systems and impact-based forecasts	REC specific recommendations on development of operational hydrological modelling for flood and flash flood forecasting systems and impact- based forecasts	Incorporation of the recommendations on development of operational hydrological modelling for flood and flash flood forecasting systems and impact-based forecasts into government concepts and decisions
		AUC recommendations on systematic and real-time data and information sharing among different institutions and transboundary exchange by using web-based GIS platforms	REC specific recommendations on systematic and real-time data and information sharing among different institutions and transboundary exchange by using web-based GIS platforms	Incorporation of the recommendations on systematic and real-time data and information sharing among different institutions and transboundary exchange by using web-based GIS platforms into NMHS and DRM laws and multilateral agreements
Warning dissemination and communication	Warning dissemination and communication	AUC regulation that warning information should be delivered from a single platform - the AMHEWAS Situation Room runs open data (MHEWAS) platform that uses the warning dissemination structures like, the four-colour system and symbols consistent across all stakeholders responsible for warning dissemination and communication	REC decision that weather and climate- related warning information should be delivered from a single platform - the MHEWAS Situation Room runs open data (MHEWAS) platform that uses the warning dissemination structures like, the four- colour system and symbols consistent across all stakeholders responsible for warning dissemination and communication	MS DRM law containing the provision that weather- and climate-related warning information should be delivered from a single platform - the MHEWAS Situation Room runs open data (MHEWAS) platform that uses the warning dissemination structures like, the four-colour system and symbols consistent across all stakeholders responsible for warning dissemination and communication

MHEWAS COMPONENT	Action	African Union Commission (AUC)	Regional Economic Community (REC)	Member State (MS)
		AUC recommendation on the public warning dissemination by television, telephone, websites, warning towers, radio, mobile short messages, and large electronic displays (tailored to the different needs of specific groups - urban and rural populations, the different genders, people with disabilities etc.) able to reach the entire population, including seasonal population and those in remote locations, through multiple communication channels (e.g. social media, sirens, bells, mobile-cellular networks)	REC-specific recommendation on the public warning dissemination by television, telephone, websites, warning towers, radio, mobile short messages, and large electronic displays (tailored to the different needs of specific groups - urban and rural populations, the different genders, people with disabilities etc.) able to reach the entire population, including seasonal population and those in remote locations, through multiple communication channels (e.g. social media, sirens, bells, mobile-cellular networks)	Domestic law defining that the public warning dissemination will be performed by television, telephone, websites, warning towers, radio, mobile short messages, and large electronic displays (tailored to the different needs of specific groups - urban and rural populations, the different genders, people with disabilities etc.) able to reach the entire population, including seasonal population and those in remote locations, through multiple communication channels (e.g. social media, sirens, bells, mobile-cellular networks etc.) Laws should promote use of common dissemination and communication protocols and channels for all hazards wherever practical
Preparedness and response capabilities	Preparedness-contingency plans	AUC preparedness- contingency plans development recommendationPublic awareness campaigns	RECspecific preparedness-contingencyplans development recommendation	MS Disaster management legislation stipulating the methodology on preparedness-contingency plans development based on the AUC recommendation
	Public awareness campaigns	AUC recommendations on the continuous continental MHEWAS campaign with the aim to educate disaster risk management services, people, media, vulnerable groups, school children etc.	REC specific recommendations on the continuous continental MHEWAS campaign with the aim to educate disaster risk management services, people, media, vulnerable groups, school children etc.	MS specific recommendations on the continuous continental MHEWEAS campaign with the aim to educate disaster risk management services, people, media, vulnerable groups, school children

Table A.1.1 : Roles and Responsibilities at the continental, regional, and MS levels for the individual MHEWAS components

Annexure 2 – AMHEWAS and Development of a Continental Situation Room

Introduction

This Annexure sets out the arrangements for coordination of natural hazard early warning systems to be achieved in Stage 1 of the AMHEWAS Programme, specifically the establishment of a Situation Room at continental level. That situation room is being developed under a wider Disaster Risk Reduction project being delivered by the African Union Commission with the support of UNDRR and financed by the Government of Italy. The situation room will have a wide remit to coordinate data in support of all aspects of disaster risk reduction, from initial risk assessment to disaster response and recovery.

While early warning and early action is only a part of that large-and-wide-ranging project, the two projects are closely aligned and have very similar requirements for the coordination of risk information gathering and sharing. Both seek to achieve the same outcomes: reduction in disaster deaths and losses across the continent.

While Chapter 4 sets out a potential model and operational structure for a fully functional MHEWAS at continental, regional, and national level to be further developed and refined over the seven-year AMHEWAS Development Programme; Chapter 5 provides a way forward for delivery of that Programme. This Annexure describes how delivery of the AMHEWAS Situation Room will greatly assist in operationalisation of a continental MHEWAS.

While there are existing arrangements for coordination of continental EWS for health emergencies such as pandemic, and conflicts, there is no clear continental coordination for natural hazard components, which have been identified as a priority for Africa. For this reason, an early task within the first stage of the seven-year AMHEWAS it is to establish key Technical Working Groups and decision-making forums at MSs, RECs and continental levels, and to concentrate on supporting enhancement and capacity building for natural hazard warning systems.

For the duration of the seven-year AMHEWAS Development Programme, it is proposed that the African Multi-Hazard Early Warning and Early Action System (AMHEWAS), established under the UNDRR/Government of Italy sponsored project, undertake the role of continental Situation Room. AMHEWAS already has a mandate for coordination, data, and information exchange on natural hazards, coordinated through a AMHEWAS Situation Room. Delivery of this function will provide a similar continental-level capacity for coordination of natural hazard warnings to those already in place for health and conflict.

During the seven-year AMHEWAS Development Programme, further work will be undertaken to consider the permanent structure and arrangements for MHEWAS at continental level, including whether separate warning coordination functions will be maintained for natural hazards, conflict and heath at continental level, or new

arrangements to create a fully multi-hazard continental warning system developed.

The continental structure for MHEWAS set out in Chapter 4 provides clear and robust communication and information links between member states, regional, and continental MHEWAS Situation Rooms. While the AMHEWAS extends beyond delivery of MHEWAS Programme and includes disaster response and recovery actions, many of the same structures and information sharing protocols will be required. The AMHEWAS therefore provides an opportunity to operationalise elements of the continental MHEWAS more quickly than would otherwise be possible.

In summary, the Annexure sets out proposals for developing and operationalising the AMHEWAS Situation Room. The proposals set out in the Annexure are intended as a starting point for discussion by the EW-TWGs suggested in Chapter 3.

Background to the AMHEWAS

The Department of Agriculture, Rural Development, Blue Economy, and Sustainable Environment, with the support of the Italian Government, UNDRR, and CIMA Research Foundation, is setting up the African Multi- Hazard Early Warning System (AMHEWAS) Situation Room that will serve as information hub, primarily for AUC organs and specialised agencies, facilitating coordination mechanism for improving preparedness, data access and risk information exchange.

The ultimate purpose of the system is to establish a coordination mechanism that will facilitate the access to and the exchange of risk data and information to Member States and decision makers at the continental, regional, and national level. While it does not seek to address all elements of early warning or disaster response and recovery in its initial phase, it will provide important information that will inform both activities, keeping decision makers and international communities informed on ongoing and upcoming hazards. Working in the direction of creating a coordinated information at continental level puts together the key actors composing the EWS around a concrete problem forcing them to identify SOPs for the sharing of data in an EWS context.

The initiative aims at building the capacity of the African Union Commission (AUC), African Centre of Meteorological Application for Development (ACMAD), Regional Economic Communities (RECs) and African Member States to effectively collect, exchange and analyse risk information relevant to impact-based Early Warning Systems (EWS) for early action and transboundary risk management.

The implementation of a continental Early Warning System (EWS) brings together the sub-regional and national actors to form a coordinated system able to prevent, prepare and respond to disasters that may be caused by different natural hazards affecting the African continent. The AMHEWAS Programme specifically looks at Target G of the Sendai Framework.

The AMHEWAS's purpose is to trigger appropriate and timely early disaster risk management actions in and among the Member States, thus working to implement enhanced vertical and horizontal coordination and exchange of risk data and information between continental, regional, and national levels. AMHEWAS builds on the outcomes of the African, Caribbean and Pacific Group of States (ACP) *Building Disaster Resilience to Natural Hazards in Sub-Saharan African Regions, Countries,*

and Communities Programme from the European Union, which ended in February 2020. The EU Directorate General for Humanitarian Aid and Civil Protection (DG-ECHO) is equally supporting the implementation of this model. Member States' Regional Climate Centres were identified as collaborators who are expected to contribute to the process leading to the establishment and operationalisation of the said systems. UNDRR has been tasked to provide, coordination, policy advice and technical guidance and communication support to ensure the effective implementation of the road map.

Furthermore, the AMHEWAS is based on the Africa Road Map for improving the availability, access, and use of disaster risk information for early warning and early action, including inthe context of transboundary risk and on the common methodology that has been appliedfor the generation of multi-hazard probabilistic risk profiles, disaster loss accounting, Disaster Risk Reduction (DRR) and cost-benefit analysis to support inclusive DRR Programmes. The combined analyses of this information feeds into the development of inclusive, holistic, and actionable strategies for DRR, Climate Change Adaptation (CCA) and Sustainable Development Goals (SDG), which include the development of impact-based EWSs for early action and transboundary risk management.

In addition to 17 African countries, also AUC, ACMAD, and RECs (namely: East African Community (EAC), Economic Community of Central African States (ECCAS), Economic Community of West African States (ECOWAS), Intergovernmental Authority on Development (IGAD) have endorsed this initiative. International organization such as the World Meteorological Organization (WMO), the International Organization for Migration (IOM), the Office for the Coordination of Humanitarian Affairs (OCHA), the Food and Agriculture Organization (FAO), the International Federation of Red Cross and Red Crescent Societies (IFRC), and other United Nations (UN) entities and donors, including the European Union DG for European Civil Protection and Humanitarian Aid Operations (DG ECHO), equally welcomed the initiative at the inter-agency meeting in Nairobi, in March 2020.

The Italian Government, through UNDRR and with the technical and scientific support of CIMA Research Foundation, are currently supporting AUC, IGAD and ACMAD in the realisation of a fully-equipped round- the-clock (24/7) situation room based in the African Union Commission premises, one situation room at IGAD and the forecasting centre in ACMAD; these structures will constitute the first backbone of the AMHEWAS that will be expanded and replicated to other centres. The following main outcomes are expected:

- The AMHEWAS Situation Room will facilitate. the exchange, monitoring and analysis of risk events. It will also promote and implement Standard Operating Procedures (SOPs) for impact- based early warning and early action, through the identification of roles and responsibilities, as well as modalities to exchange and analyse risk data. For the purpose of the AMHEWAS framework and seven-year Programme, the AMHEWAS Situation Room will fulfill the mandate of the MHEWAS Situation Room in addition to its wider mandate during disaster response and recovery. MyDEWETRA platform, an open-source monitoring system developed by the Italian Civil Protection Department and endorsed by the World Meteorological

Organization will facilitate data exchange among partners at different levels, informing decision makers and international communities on ongoing and potential future hazards.

- Capacity building activities for disaster risk reduction (DRR) practitioners, to strengthen existing monitoring and forecasting capabilities regarding weather-related hazards and their impacts, to trigger early and more effective preparedness and response actions, contributing to substantial increase and availability of and access to Multi-Hazard Early Warning and Action Systems and disaster risk information and assessments to the people by 2030 (Target G of the Sendai Framework for DRR).

Mandate and Objectives of the AMHEWAS

The African Multi-Hazard Early Warning and Early Action System (AMHEWAS will be responsible for monitoring and analysing risk events focusing on natural hazards, allowing risk-data exchange among different institutions at the continental level, while collecting and channeling risk-information to decision makers for timely actions. Through a multi-stakeholder cooperation among AUC, ACMAD, RECs, MSs and international actors, the aim of the AMHEWAS is to inform and alert decision makers of possible and/or ongoing disastrous hazards and related impacts and enhance preparedness and coordination for early actions.

Outputs and Working Modalities of the AMHEWAS

An end-to-end Early Warning System depends on the effective coordination of several elements. Those elements are delivered by different institutions at continental, regional and member state level. A subsidiarity principle will be applied between levels, meaning that Member States have primary responsibility for development and maintenance of warning system components, with support and coordination provided by Regional Economic Communities. Similarly, Regional Economic Communities and Member States are supported by the African Union Commission level, for example in coordination of programmes, provision of training, and sharing of good practices.

It is acknowledged that initial focus should be on enhancing warnings for natural hazard events and that the starting point is to recognise what it is already in place and concentrate building capacity and capabilities of those existing systems through enhanced capacity building, coordination, and data sharing.

In the case of natural hazards, several sectoral entities must deliver separate components of the same end- to-end warning system. For example, at national level National Weather Services (NWS), National Hydrological Services (NHS), National Geological/ geophysical Units (NGU) must coordinate with the National Disaster Management Agencies (NDMA) and local counterparts.

At regional level DRR and other specialist Units must coordinate with Regional Climate Centres and Member States, and at continental level the African Centre of Meteorological Applications for Development (ACMAD) provides critical overview of meteorological hazards, working with other specialist units and bodies and liaising with international partners such as the WMO. All these actors need to be considered in the design of

Centre	Function
ACMAD/WMO Regional Climate Centre	ACMAD acts as an African Centre of reference in meteorology and its application to development, and as a resource Centre to stimulate applied scientific research especially in tropical meteorology and in rain-producing systems and to enrich existing training and Development Programs. ACMAD provides a meteorological/climatological Early Warning monitoring system based on the state-of the art for analysis and prediction, to combat and mitigate the effects of drought, tropical cyclones, and other climate-related natural disasters
IGAD/WMO Regional Climate Centre	Since 2014 ICPAC is a World Meteorological Organization (WMO) Regional Climate Centre (RCC) of excellence in the provision of climate services to national and regional users of Eastern Africa. ICPAC provides Climate Services to 11 East African Countries aiming at creating resilience in a region deeply affected by climate change and extreme weather
SADC Climate Services Centre/WMO Regional Climate Centre	The SADC Climate Services Centre provides operational, regional services for monitoring and predicting extremes in climate condition. The Centre develops and disseminates meteorological, environmental, and hydro-meteorological products. The Centre's products contribute to improved disaster risk management in the region and help to ensure Member States are better prepared for weather and climate disasters, conservation and protection of natural resources
Tropical Cyclone Advisories / WMO Regional Specialized Meteorological Centre, La Reunion	The RSMC La Réunion is responsible for the monitoring of all the tropical systems occurring over its area of responsibility (from the equator to 40°S and between African coastlines to 90°E) Its primary mission is to provide appropriate guidance information (analysis, forecasts) to the 15 Member States of the region (National Meteorological and Hydrological services of Botswana, Comoros, France, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zimbabwe). Beyond this fundamental operational function, the RSMC plays a role for Training and Research.
WMO Regional Specialized Meteorological Centre Dakar (Agence Nationale de l'Aviation Civile et de la Météorologie, Senegal)	RSMC Dakar is responsible for analyses of the available products and information and the development and issuance of daily Severe Weather Forecast Guidance product for use by NMHSs of participating countries to issue alerts, advisories, and weather warnings for high impact weather (Benin, Burkina Faso, the Gambia, Ghana, Guinea, Cote d'Ivoire, Mali, Senegal and Togo)
WMO Regional Specialized Meteorological Centre Pretoria (South African Weather Service)	SAWS is a recognised WMO regional specialised meteorological centre (RSMC) and therefore provides weather products to meteorological services within the Southern African Development Community (SADC) Region
Regional Climate Centre for North Africa	RCC-NA is a regional climate centre for the North Africa region whose members are Morocco, Algeria, Tunisia, Libya and Egypt. This centre assists Members to deliver better climate services and products and strengthen their capacity to meet national climate information needs. RCC-NA has been decided to be in the form of an RCC-Network, each country lead in the performance of the respective RCC functions for the entire North African Region

Table A.2.1 : WMO designated Regional Climate Centres and Specialised Centres in Africa

the coordination function of the Africa Multi-Hazard Early Warning and Early Action System (AMHEWAS). The following table includes the WMO-designated technical centres (and their functions) that should be considered as a starting point and as constituent parts of the AMHEWAS.

A natural hazard early warning system required four components to be delivered and harmonised: risk knowledge; monitoring and warning service; warning dissemination and communication; preparedness and response capability

Specialist scientific and technical bodies at MSs, RECs, and continental levels monitor specific and sectoral hazards, but the remaining three warning system elements are not necessarily hazard specific and there are opportunities to jointly develop them through greater harmonisation and partnership working across sectors and hazard warning types.

Whilst it may be possible in the long-term to incorporate all types of hazards within a single MHEWAS, there are immediate opportunities to coordinate all natural hazard warnings and ensure that transboundary impacts and cascading effects

For example, working to better understand vulnerability and risk forms a critical part of the Disaster Risk Knowledge component of any warning system, so information gathered towards strengthening capabilities, protocols and systems for warning dissemination and communication, will add value to all warning systems and is not limited to a single hazard.

The opportunities for enhanced sharing of data and collaboration within a Multi-Hazard Early Warning System cannot only reduce the costs and burdens for individual sectoral warning systems, but it can also help to enhance capacity and capabilities for all thus providing a greater end-user confidence in the quality and reliability of the warnings produced.

Therefore, a second pillar, identified together with the RCCs, is the appointment of Coordinators at continental, regional and member State levels. The Coordinators will chair their respective EW-TWGs and ensure effective communication between each of the levels. For the AMHEWAS, it is proposed to rely on the existing network of DRR Focal Points at national and regional level, which is time is expected to evolve into the EW-TWG. The DRR Focal Points are an already consolidated network that meets under the Africa Working Group on Disaster Risk Reduction (AWG DRR). At the national and regional level these focal points can provide systematic information exchange on components of a warning and DRR system, such as exposure and vulnerability data.

Given the many bodies and institutions that already produce indispensable information to predict and monitor natural hazard and their related impacts across the African continent, it is important to avoid duplication. Hence, the AMHEWAS Programme proposes a focus on providing support to build capacity and strengthen existing elements, while improving information and coordination sharing under the umbrella of a fully coordinated continental MHEWAS. The establishment of round-the-clock (24/7) continental Situation Room is expected to support this process. One continental Situation Room will avoid duplication and assist in this process by monitoring data and information from multiple sources, in respect of multiple hazards, with the ability to quickly assimilate that information and issue warnings and situation reports to relevant AUC Departments and decision makers.

The AMHEWAS Situation Room in Addis Ababa would support delivery of continental MHEWAS products, including the coordination of information and data sharing, issuing of early warnings, and initiating Early Action at the continental level. A proposed work flow is included below in Figure A.2.1.

In its first implementation, the AMHEWAS Situation Room is an intelligence room at the AUC premises that informs AUC organs and departments for early action purpose, able to provide timely information and coordination guidance on disasters triggered by natural hazards on the African continent.

The situation room shall prepare, issue, and disseminate reports pertaining existing disasters events or foreseen hazards that may result in disasters. These early warning operations should be performed following pre-defined and planned time line, agreed among all relevant stakeholders.

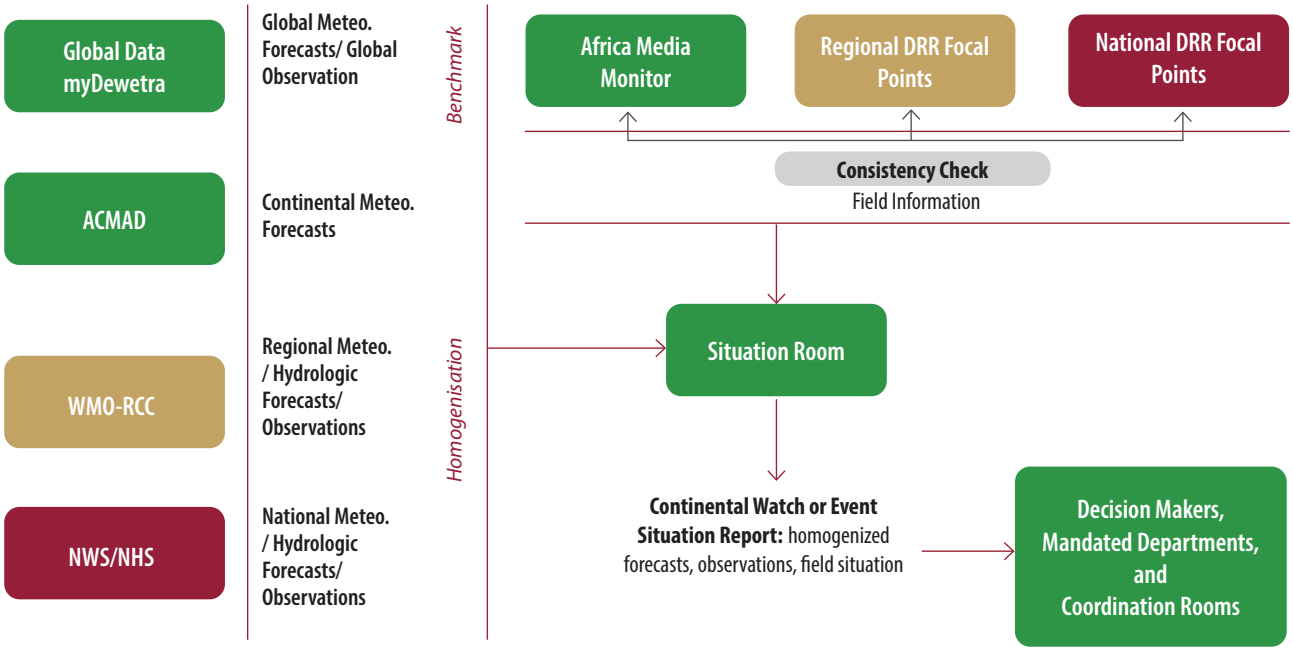

Figure A.2.1 : Proposed Work flow for the AMHEWAS Situation Room

In performing its early warning operations, the situation room will be issuing two kinds of products: the Continental Watch (CW) Report, and the Event Situation Report

The Continental Watch report (hereinafter CW) is a scan of the whole continent on any potential hazards that might be expected to result in a disaster. The scan is conducted through different technical ICT programmes available at both global and continental scale. In particular the situation room will (as shown in Figure A.2.1) gather forecast and observations from different sources, here mainly described with reference to weather related hazards as they are the ones where forecast capabilities produce the most relevant impact:

1. From global EWS systems and models (e.g.Global Flood Awareness System or GloFAS) and from global observation networks freely available (e.g. satellite data) that will be used as a benchmark to other forecasts in the region.
2. Continental forecasts produced by ACMADthat will provide the main basis for the CW reports. Additional observations collected and managed by ACMAD will be factored in.
3. Regional forecasts and outlooks produced by the different Regional Climate Centres. This is especially valuable when hydrological information should be included (e.g. in the case of floods). Now ACMAD does not have the mandate or tools to cover operational hydrology while some RCCs are getting ready to provide hydrological forecasts. Observations from the regional network will also be considered.
4. National Public Weather Services will also provide National level forecast and severe weather information that will be integrated in the CW Report. The CW report will present this information consistently to ensure coherent interpretation as widely as possible throughout Africa.

The information collected from the above-mentioned sources will be integrated in a consistent way in the CW report following SOPs that are concerted among the different partners through the work of the EW-TWG as proposed in the framework (Chapter 3). The CW Report is then delivered to decision makers and relevant

stakeholders so that they could take timely and informed decisions. CW Reports may be provided for anticipated hazard events so that warnings can be generated (e.g. an approaching tropical cyclone). The CW reports envisaged by the AMHEWAS may be further developed by EW-TWG during the seven- year AMHEWAS Programme to enable them to fulfill the role of continental early warnings as set out in Chapter 4.

To make the best use of the Continental MHEWAS Situation Room for the purpose of MHEWAS delivery, EW-TWGs at MSs, RECs and continental levels should work to harmonise with the AMHEWAS project and work with the responsible sectoral bodies to harmonise and incorporate existing sectoral early warning monitoring systems into the overall MHEWAS.

The second product envisioned for the Situation Room is an Event Situation Report, which will be issued after early warnings have been given and a disaster event has occurred. The Event Situation Report does not form part of any MHEWAS warning system for the Member State or region already impacted, but the information it contains may trigger an early warning (or CW report) for a neighbouring MS or region yet to be impacted where there is a risk of transboundary spread.

Event Situation Reports should be prepared immediately after the disaster event takes place (or in advance according to specific circumstances), whilst subsequent reports should be produced as the situation advances. In respect to the CW report, the Event Situation Report is enriched with relevant information of what is happening on the ground, including a systematic description of the evolving impacts possibly in quantitative terms. The hazard forecasts and observations will be produced and updated throughout the event period. To effectively include information about impacts two main sources are envisaged:

1. The Africa Media Monitor already in use for conflicts monitoring, with keywords specialized for the Natural Hazards

2. The network of the DRR focal points at Regional and National level as well as Regional sources in case they do serve already as an information hub for losses and impacts on the ground.

These reports shall be produced in consultations with the National and Regional DRR focal points, with representatives of the Disaster Risk Management Agencies or others with responsibilities to provide all the necessary information pertaining the event.

The information required from the DRR Focal Points includes a general description of the event (hazard, impacted areas) and consequential event-related impacts (disaster loss data).

Once a hazard has impacted, and in the absence of a Continental Disaster EOC, the relevant continental department is responsible for coordination of disaster response and recovery operations at continental level. During disaster response and recovery operations, the AMHEWAS Situation Room will continue to provide forecast and other hazard related data to the relevant continental department or coordination centre.

During disaster response and recovery operations, the AMHEWAS Situation Room may also support regional counterparts through the provision of forecast and other hazard related data on request.

The African Union Commission Situation room will be responsible for collection of information, analysis of the information and dissemination of

reports to all stakeholders or the general public when required to do so.

The above-mentioned reports are not a generic collation of information produced by uncoordinated centres, but they bring together all identified actors to produce forecast information about predicted events and their expected impacts according to a well-established and commonly-agreed scale of impact intensities based on objective and recognised thresholds.

This process is being concerted by all involved actors at all levels and represents a first challenge for the MHEWAS implementation. Although this will not happen from the outset, the common SOPs prepared by all involved actors will translate in specific messages.

Such early warning messages will be issued when clearly defined thresholds on expected impacts have been breached as set out in the MHEWAS framework. Such messages will be communicated directly to those required to act, giving them the information that they need to act upon (see next section). However, the road to engage with such automatisms needs to be built with a longer and shared process as proposed in the MHEWAS framework

Roles and Responsibilities of the AMHEWAS

Establishing an EWS able to trigger appropriate and timely actions in the field requires the effective coordination of multiple sectoral partners and communities themselves. These components cannot be developed in silos but should be developed through the consistent and coordinated framework set out in the continental MHEWAS model.

The AMHEWAS requires robust arrangements to strengthen cooperation among the different actors responsible for components of the EWS. Particularly, at continental level, the continental coordination function is vital to bring together data and information from many different sources, and to ensure that it is effectively communicated to all those that need it. The network of DRR and early warning specialists established through the AMHEWAS Programme will help to facilitate coordination at the continental, regional and member state levels.

As set out in Chapter 4, the structures for collaboration and coordination should build on a consistent legal and institutional framework that identifies the roles and responsibilities of each partner, and at each jurisdictional level, both to empower those partners and make them accountable for their actions.

The operational and institutional framework will create a continental cooperative space to facilitate EWS management, communication flows and monitoring of events. It will support the promotion of risk situation awareness at continental scale enabling AUC and the situation room to provide support to Member States. The proposed framework presents a possible simplified institutional and operational arrangement among different actors at continental, regional, and national level based on the existing decision at the AUC level[1] (African Union Commission Executive Council at its 24th session).

1 Africa MHEWAS corresponds to one of the targets established by the African Union Commission Executive Council at its 24th session, to "Substantially increase the availability of and access to operational multi-hazard Sub-National, National, and Regional Early Warning Systems, assessment, and information by 2030".

Stemming from the principle of subsidiarity, intrinsic in emergency management strategies, the framework delineates when and how regional and continental response would be requested and conducted (see Section 5.6.2 in Chapter 4 – Continental Warning Activation Levels and Criteria).

The drafting of the operational framework presents an improved cross-sectoral coordination which takes into consideration lessons learned from past events, focus being placed onto transboundary events and the ongoing COVID-19 pandemic.

As a result of the proposed framework a series of responsibilities are identified for the continental level. The Continental AMHEWAS Situation Room facility undertakes four key roles.

1. Provision of technical leadership, support and direction for Early Warning System development and operation to assist REC's and Member States. In doing so, the Continental AMHEWAS Situation Room will facilitate effective communication and data sharing between different sectoral stakeholders, and between the AUC and international bodies such as the World Meteorological Organization.
2. Maintaining situational awareness at the continental level, monitoring hazard information and warnings issued at the MS and REC level, coordinating information sharing between RECs, and issuing situational reports on hazard events for AUC bodies and decision makers.
3. Provision of continental warnings and facilitation of cross boundary exchanges of information between RECs to assist in evaluation of transboundary impacts or anticipated impacts arising from any hazard event.
4. Provision of ongoing hazard monitoring information and data to the Continental Disaster Coordination Centre during disaster response and recovery operations. The provision of situational information and support provided by the AMHEWAS Situation Room will extend beyond early warning and early action. During any disaster response, the continued coordination of hazard related data and information and situation reports by the DRR Situation Room / MHEWAS facility will provide decision makers at the continental disaster coordination facility with the forecast and other hazard analysis necessary to inform decisions related to disaster response and early recovery.

In undertaking their role, the DRR Situation Room (MHEWAS facilities) will ensure that timely and authoritative warnings, data, and information is shared among all relevant decision makers and continental bodies including existing sectoral hazard monitoring bodies.

Specific continental responsibilities related to individual MHEWAS components include the following (see Table A.2.2) that are better specified in relation to the implementation of the AMHEWAS Situation room.

Continental Level		Main Actors
1. Disaster Risk Knowledge	Support RECs in their Risk Knowledge work	AWG and the DRR Regional and National Focal Points
	Collate, aggregate, and disseminate Continental Risk information and mapping, working in collaboration with other Continental facilities such as ACMAD, CEWS, CDC, CCC, ARC and others	
	Facilitate the development of standardised MHEWS risk assessment approaches, mapping, and goals that may be adopted by RECs and MS	
	Facilitate international coordination and collaboration on risk mapping at the Continental level	
2. Detection, Monitoring, Analysis and Forecasting of the Hazards and Possible Consequences	Coordinate monitoring, analysis, and forecasting systems for identified hazards at the continental level, working in collaboration with specialist hazard monitoring bodies such as ACMAD, RCCs and others	WMO Designated RCCs and NWS/NHS (forecasts and Hazard monitoring) DRR Regional and National Focal Points (Impacts and loss data)
	Establish continental warning systems as a combination of the global, continental, regional and national forecast and monitoring resources	
	Ensure effective institutional mechanisms for hazard monitoring are in place at AU level as well as monitoring the effectiveness of those in place at REC and MS level	
3. Warning Dissemination and Communication	Establish organizational structures and decision-making processes for dissemination and communication of continental warnings (AMHEWS Situation Room).	WMO Designated RCCs and NWS/NHS DRR Regional and National Focal Points
	Ensure communication systems and equipment are in place and operational, and that the Common Alerting Protocol (CAP) is adopted	
	Ensure that impact-based warnings are communicated effectively to prompt action by Decision Makers and target groups	
4. Preparedness and Response Capabilities	Ensure that continental disaster preparedness measures, including response and Early Action Plans, are developed and operational through the AWG and the DRR Focal Points Network	AWG and the DRR Regional and National Focal Points
	Ensure that continental public awareness and risk education campaigns are coordinated	
	Ensure that continental Early Action Plans are tested and evaluated	
	Ensure MHEWS data and analysis can be made available to inform Continental responses managed through the Continental Coordination Centre	
5. Governance and Institutional Arrangements	Ensure that Early Warning is secured as a long-term Continental priority	AWG
	Ensure that legal and policy frameworks to support Early Warning are established	
	Ensure that institutional capacities at continental level have been assessed and enhanced	

Table A.2.2 : Continental roles and responsibilities for the individual MHEWAS components

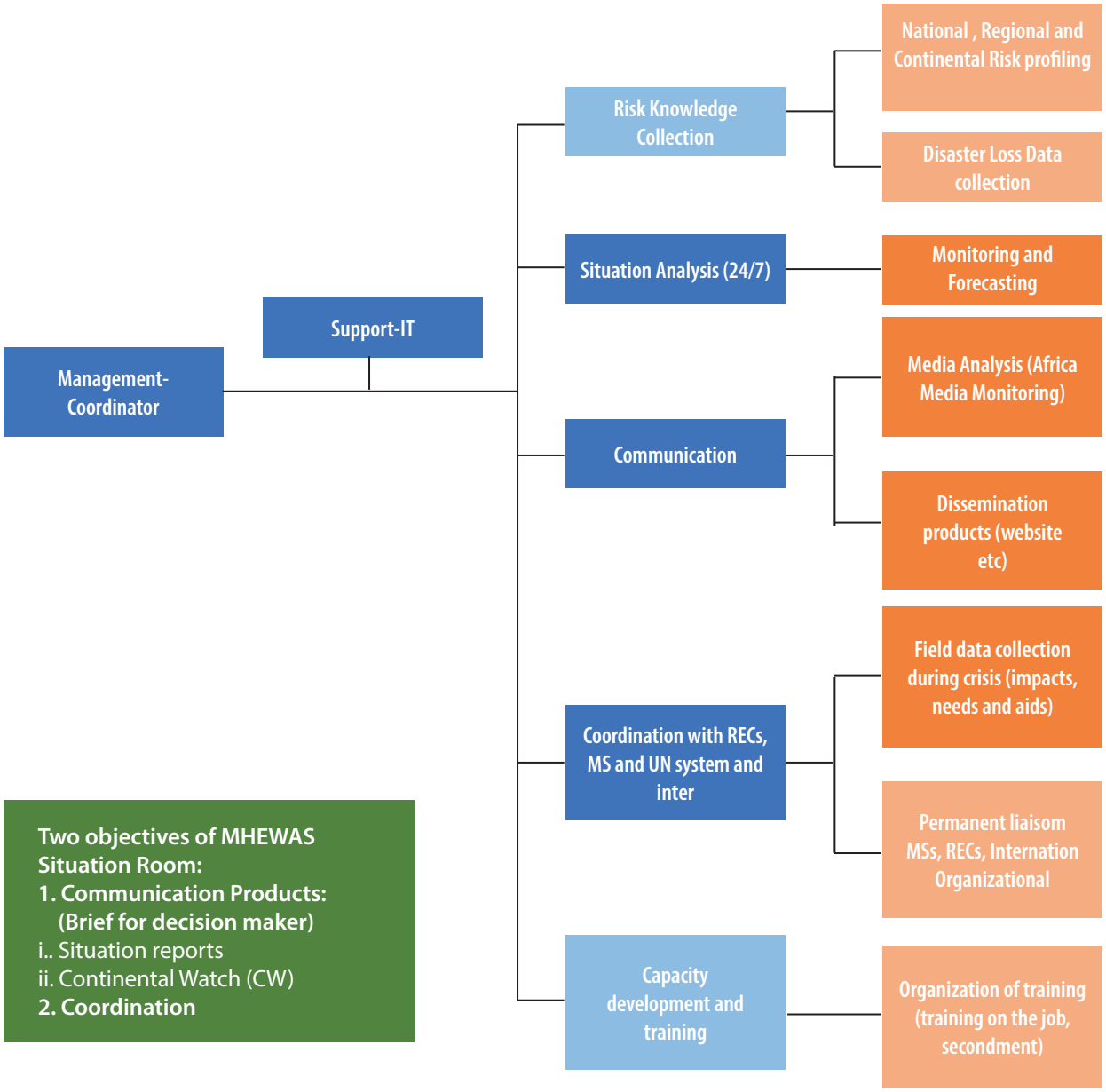

Figure A.2.2 : AMHEWAS Continental Situation Room: Offices and Functions

Continental Situation Room: Functions

The AMHEWAS Situation Room is composed of several duty officers who work directly with the different stakeholders identified in the previous chapters. Figure A.2.2 above shows the functions envisaged for the AMHEWAS continental situation room. In the figure, two typologies of functions that are identified. First, a first block (represented in dark colours) are the functions and activities operated on a daily basis and within a round-the-clock (24/7) context. And second, the boxes in lighter colours, which include the functions that are operated in an off-line context to support and strengthen the daily operations such as:

- The **situation analysis function** includes continuous collection of forecasts and observations from different sources, their homogenisation and elaboration to compose the CW Report and the Event Situation Report in case an event is already unfolding.
- The **communication function** that includes data collection from the Africa Media Monitor for the Event Situation Report compilation as well as the dissemination of reports.

- The **coordination function** that is crucial for field data collection from the regional and national levels. This function also has an off-line aspect that aims to strengthen and expand the network of DRR Focal Points and institutions that enable the data collection during events. In the long term, such a function should be expanded as much as possible to systematise aid requests and offers in a centralised database to ensure smooth planning and timely actions.

The remaining offline operations are:

- The **risk data collection and knowledge function** supporting exchange of data on risk and related methodologies
- The **capacity development and training function**

In a first implementation stage, these functions will mainly be exercised at the political level, providing:

- Management of requests and offers from/to Member States
- Coordination and synergic support actions with RECs and International Agencies and other international actors
- Facilitation of the AUC support to affected countries through mobilisation of aid and assistance from Health department, Political Affairs, AUC Chair, etc

Dedicated efforts are envisioned for the development of a proper methodology for countries to directly submit DRR updates to AUC to ensure a complete and reliable Event Situation report. The Situation Analysis and Communication Functions are mainly supporting the identified routine outputs of the Situation Room:

- The **Continental Watch (CW)** – This report is issued twice a week: Tuesdays and Fridays, and it provides an overview of continental Disaster risk information and knowledge-based products on the systematic collection of primary and secondary data. It also determines a severity level of the event expected based on the impacts this event might have on the ground.
- The severity level determines the actions to be triggered by the different actors receiving the report.
- The **Situation Report (SR)** - This report is issued when an extreme event occurs or when thresholds of identified hazards are breached; it gives an overview of an unfolding disaster situation, highlighting pertinent disaster risk information to policymakers, and knowledge-based products on the systematic collection of primary and secondary data. As for the CW report it also determines a severity level of the event evolution based on the impacts this event might have in its future evolution. The severity level determines the actions to be triggered by the different actors receiving the report.

Disaster risk knowledge

- Are key hazards and related threats identified?
- Are exposure, vulnerabilities, capacities, and risks assessed?
- Are roles and responsibilities of stakeholders identified?
- Is risk information consolidated?

Figure A.2.3 : One out of the four essential elements of a MHEWS (Source: WMO, 2017: MHEWS Checklist)

Figure A.2.4 : Three (out of the four) essential elements of an end-to-end people-centred MHEWS (Source: WMO, 2017: MHEWS Checklist)

Essentially, both the CW and Event Situation Report identify key hazards and related threats and related impact and risk information to be disseminated to departments/portfolios within the AUC. The consolidated risk information is systematically gathered from both primary and secondary sources.

Within the Coordination and Collaboration, the two communication products highlighted above are shared with AUC organs and departments for their information and action. The identified AUC organs and departments which the CW and Event Situation Report will be disseminated to are:

1. Office of the Chairperson
2. Agriculture, Rural Development, Blue Economy, and Sustainable Environment (ARBE)
3. Health, Humanitarian Affairs and Social Development (HHS)
4. Political Affairs, Peace and Security (PAPS)
5. Information and Communications Directorate
6. Management of Information System (MIS)
7. Africa Risk Capacity (ARC)
8. Permanent Representative Council – Sub-committee on Environment
9. Peace and Security Council PSC

Depending on the information received in the CW and Event Situation Report, the MHEWAS can provide coordination guidance and support to decision makers of the above highlighted departments or portfolios of the AUC. Essentially, the kind of coordination guidance and support given is reflected or guided by the three essential elements of a MHEWAS highlighted in Figure A.2.4.

There is a long experience in early warning and early action system at the national level across the world and in Africa. However early warning and early action systems and supranational level are less common (EU, UN system, AHA centre, etc.); and are highly connected with the mandate of the supranational organization. In the context of the coordination function, the table below (Table A.2.3) is an initial exercise to clarify the decisions that can be taken by different departments and units of AUC and the information required.

Agency/Department	Action/Decision/Policy	Information needs and potential provider
Department of Agriculture, Rural Development, Blue Economy and Sustainable Environment (DARBE)	• Host and coordination of operation of AMHEWAS Situation Room to facilitate AU assistance to affected Members States • Facilitate International organizations' assistance to affected Members States • Provide risk knowledge for MHEWAS • Provide weather and climate services for MHEWA through ACMAD • Disseminate MHEWS information when events are of continental relevance • Facilitate development of preparedness and contingency plans • Facilitate simulation exercise and capacity building of RECs and Member States on MHEWAS • Facilitate multi-stakeholders' engagement on establishment of sustainable disaster risk financing instrument (mechanism) • Press statements (by the Commissioner)	Regional/Continental situational update by GFCS/ACMAD Regional MHEWAS forecast from RECs National MHEWAS forecast Impact and field information from the Regional and national DRR focal points Department of Infrastructure and Energy
Department of Health, Humanitarian Affairs and Social Development (HHS)	• Prepositioning humanitarian supplies and equipment • Coordinate humanitarian/disaster response • Collaborate with DARBE in development of preparedness and contingency plans • Participate in organization of simulation exercises • Utilise natural hazards warning for health preparedness	Request for humanitarian assistance by Member States Situation Room CW Reports and SitRep
Department of Political Affairs, Peace and Security (PAPS)	• Facilitate deployment of military assets for search and rescue operations • Collaborate with DARBE in development of preparedness and contingency plans • Participate in simulation exercises • Utilise natural hazard Early Warning for conflict warning and preparedness	Request for humanitarian assistance by Member States Situation Room CW Reports and SitRep.
Information and Communications Directorate	• Organize media briefings • Facilitate dissemination of MHEWS messages	Situation Room CW Reports and SitRep
Management of Information System (MIS)	• Manage MHEWAS server • IT support	N/A
African Risk Capacity (ARC)	• Participate in development of preparedness and contingency planning • Deploy Africa Risk View (ARC) where applicable • Trigger pay-outs in line with the MoUs signed with individuals Member States • Share modelling and data knowledge on risk with the MHEWAS system	Situation Room CW Reports and SitRep

Agency/Department	Action/Decision/Policy	Information needs and potential provider
AUC Chairperson	• Authorize budgets and disaster operations • Chair emergency coordination meeting • Brief AU Peace and Security Council and PRC • Request sitting of AU Peace and Security Council where applicable • Brief the media • Chair Stakeholders meetings/briefings on prevailing situations	Situation Room CW Reports and SitRep
PRC Sub-committee on Environment	• Strategic policy oversight for operation of MHEWAS/Disaster Operation Centres • Engage PRC on budgets and programs for MHEWAS/Disaster Operations Centre • Update PRC and AU Peace and Security Council on prevailing hazards/emergency • Undertake Early Warning missions* or solidarity missions to affected member states	Situation Room SitRep
Peace and Security Council	• Conflict prevention and Early Warning also on the basis of possible upcoming events that might exacerbate unstable conditions • Crisis management • Post-conflict reconstruction	Situation Room CW Reports and SitRep

Table A.2.3 : Actions and Decisions taken by the Different AUC Departments and Organs

Various departments at continental level are already tasked with duties that can either benefit or be beneficial to the AMHEWAS and should be connected to the Situation Room so that information can be gathered as input for the report and it can be shared back for use in the different domains of competence of the various departments in AUC. Here below a brief description of the key departments identified.

The **Department of Agriculture, Rural Development, Blue Economy, and Sustainable Environment (ARBE)** plays a central role in the system as it has the mandate to facilitate and coordinate the implementation of the African Regional Strategy on Disaster Risk Reduction (DRR) and its Programme of Action (PoA) in line with the Sendai Framework. This mandate clearly includes achievements in the target G of the Sendai Framework. DARBE is also mandated to enhance capacities of Member States and RECs to access near real time environmental monitoring is important for natural resources, and climate information for policy and decision-making, and development planning. Importantly, near real- time environmental information is particularly relevant to support trans-boundary risk management and prioritisation of supranational interventions. As such, DARBE also has the potential to coordinate policy on EWS and preparedness as part of climate adaptation actions in close connection with multi-purpose climate, weather, and water services. The AMHEWAS Situation Room being developed by DARBE will play a critical role in delivery of MHEWAS. The operation and function of the AMHEWAS Situation Room is set out in more detail at Annexure 2.

The **Department of Political Affairs, Peace and Security (PAPS)** is responsible for promoting, facilitating, coordinating and encouraging democratic principles and the rule of law, respect for human rights, participation of civil society in the development process of the continent and the achievement of durable solutions for addressing humanitarian crises.

The responsibilities for humanitarian assistance are particularly relevant, as well as its role in engaging UN entities. The department also supports the Peace and Security Council (PSC) in the exercise of its responsibilities under the PSC Protocol. It leads the main activities of the AUC Commission related to peace, security, conflict resolution and the promotion of stability. PAPS is also responsible for conflict prevention and early warning, as well as crisis management and post-conflict reconstruction. As such, PAPS has a robust capacity for intervention in the field during disastrous events, including for Search and Rescue (SAR) activities.

The **Department of Health, Humanitarian Affairs and Social Development (HHS)** works to promote the AU's health, labour, employment, migration, social development, drug control, crime prevention, sport, and cultural agenda. HHS's role in case of disasters is notably important because health implications during disasters are crucial to assess and mitigate. With this in mind, HHS's cooperation with the Africa Centres for Disease Control and Prevention (Africa CDC) is highly strategic. HHS, through its function Humanitarian Affairs, Refugees, and Internally Displaced Persons (HARDP), can also provide insight into the link between disasters and migration, as well as IDPs intensification during or in the immediate aftermath of a disaster.

HHS is also responsible for promoting social protection during emergencies in order to increase the resilience of the population through disaster risk financing mechanisms. Such risk transfer mechanisms are essential for an efficient DRM cycle implementation and can be naturally linked to EWS (e.g. through parametric insurance).

The **Department of Education, Science, Technology, and Innovation (ESTI)** coordinates the AUC Programmes on human resource development, education, science, technology and promoting the youth development agenda. This department provides different key contributions to the coordination function: through the provision of technical capacity in the fields of GIS and data analysis, or by creating the link with the capacity development network in cooperation with universities and research centres to support, in the long term, the coordination function itself.

Currently coordination among the five departments above exists on a practical level, based on voluntary cooperation. There is a need to revise and formalise the coordination among the departments. Coordination among the five departments is critical in the planning phase.

The platform can facilitate understanding what happens if the facilities managed by the departments are affected by a disaster, and accordingly design contingency plans. A possibility being currently discussed in AUC is the establishment of an inter-departmental task force. The added value of a strengthened AUC coordination function includes:

- Provide a strong and reliable financial mechanism to support Member States in case of disasters (e.g. revision of the Drought Response Fund into a Disaster Response Fund)
- Provide coordination of training and education in support of DRR with focus on prevention, mitigation, preparedness, and response
- Provide response resources to countries in case of a disaster
- Create a favourable environment for the

creation of a civil protection and DRR culture
- Create an enabling environment (Legal and Technological) for an efficient data and information sharing among Member States

Continental Coordination Centre

The Continental Coordination Centre has the ultimate function to support countries during emergencies facilitating cooperation among different actors from the AUC organs and specialised agencies, Regional Economic Communities as well as Member States that can offer assistance to the affected Member States. The Continental Coordination Centre will be located in the AUC and the Commissioner of DARBE will have the lead. Other line department of AUC will compose the Continental Coordination Centre together with representatives of international organizations and Member States.

The Continental Coordination Centre will have the following objectives:

- Facilitate coordination of assistance provided by AUC organs and specialised Agency to Affected Members State
- Based on assessed needs coming from the Continental Situation Room, mobilise aid and assistance for affected countries from international organization and foreign countries
- Seek assistance offers from AUC Member States and facilitate coordination between the different MS offering assistance to the affected country/countries

Specific SOP for the functioning of the Coordination Centre will need to be developed.

Hazards to be considered

EWS requires accurate knowledge and understanding of existing and potential disaster risks. To do this accurately, systematic collection of data and disaster risk assessments needs to be carried out. This allows Impact-Based Early Warnings to be issued and ensures that recipients of the EWS better understand the risk scenarios they face so that they can make plans for effective Early Action.
Detection, monitoring, analysis and forecasting of the hazards is a critical element of an EWS.
In order to appropriately respond to potential natural hazards, it is essential to have continuous monitoring of the associated risks of hazards and provide easily understandable warnings to decision makers (individuals, organizations, or the Government) in a timely manner.

The main hazards affecting the African continent are related to extreme weather events. These include heavy rainfall, strong winds, floods, rainfall-triggered landslides, tropical cyclones, drought. The continent is affected by other hazards such as earthquakes, volcanoes, tsunamis, extreme heat, etc. Therefore, the AMHEWAS will focus in the first period on the following hazards: I. Floods; II. Earthquakes; III. Droughts; IV. Tsunamis; V. Cyclones; VI. Volcanoes

The Continental Watch report will offer a general overview of all the potential natural threats, assessing with a predefined colour coding (green, yellow, orange, and red) the possible severity of hazards. Event Situation Reports will focus only on-going disasters that have already occurred, and whose aftermaths are still affecting population and predicted to continue doing so. The colour coding here refers to a level of severity of the

event that has been already identified as an event of continental interest according to the defined continental AMHEWAS Warning Tiers (see Chapter 4).

The Standard Operating Procedures for the CW and the Event Situation Report preparation here Annexed define the information flow as well the template for the bulletins based on the colour coding.

Warning levels of activation and dissemination

The Framework in Chapter 4 identifies the warning tiers in order to determine levels of activation of the system from the national to the continental level. The four tiers envisaged are:

1. Tier 1 – Events of sub-national interest
2. Tier 2 – Events of national interest or when it is expected that the sub-national authorities would not have enough resources to cope with the emergencies
3. Tier 3 – Events of regional interest with a strong transboundary component or when it is expected that the national authorities would not have enough resources to cope with the emergencies
4. Tier 4 – events of continental interest with a strong transboundary component spanning across more than one REC or when it is expected that the national authorities of MS would not have enough resources to cope with the emergencies

A continental warning can be issued:

- Where a significant hazard impacts, or has the potential to impact, multiple RECs
- Where a significant hazard results, or has the potential to result, in significant consequences for a MS or REC
- Where a significant hazard requires the coordination of hazard monitoring support for MSs or RECs at the continental level

Once a continental-level warning is issued, the Continental MHEWAS Situation Room will ensure all hazard and warning information, along with situation reports relating to those hazards, is shared, and disseminated to AUC decision makers, international bodies, RECs and MSs interested by the event.

The Situation Room products are structured around certain criteria and procedures to be followed by duty officers and relevant stakeholders in developing and disseminating both the Continental Watch and the Event Situation reports. Issuance of those products are meant to help AUC, RECs and MSs to prepare for the forecast risks and take all the necessary actions, shifting from managing disasters to managing risks.

The standard operating procedures for the production of the situation report on events of continental interest will include different levels of warning according to a specific colour code for the different hazards considered.

The initial SOPs that need to be discussed and endorsed by the EW-TWG, will suggest 4 levels of severity to be referred against to in the Event Situation Reports. Those severity levels span from: Limited, Moderate, Severe and Extreme. Each severity level is defined based on the impact caused by each hazard when becoming a disaster.

The Continental Watch reports will focus on potential hazards which are on the verge of breaching a trigger point as defined for each hazard type as requiring a warning to be issued.

The situation report is critical for informing decision makers on taking early actions; thus, it will follow a template that includes recommendations for AUC, RECs, and Member States.

The Situation Room products' main sources of information are based on forecast from the major Early Warning Systems across the globe focusing on a regional scale. Before issuing a Situation Room product, early warnings issued by regional forecasters will be consulted for comparison and harmonisation. Therefore, only the most trusted, reliable, and timely sources of information are going to be used for developing valuable early warning and alerts.

Alerts are issued based on primary and secondary data-driven analysis of identified natural hazards. More importantly, the table proposes contingency/ preparedness actions/decisions response in alignment to the functions of the MHEWAS functions to different departments of AUC.

On its introduction, the Situation Room products will be restricted to the hazards resulted from natural hazard events: heavy rainfall, floods, earthquakes, drought, tsunamis, cyclones, and volcanic eruptions.

The Regional Climate Centres (RCC) that contribute to the development of the Continental Watch reports have a consistent focus on weather forecast; drought information can be accessed through multiple EWSs including MyDEWETRA, and other initiatives including the East Africa Drought watch. For Event Situation Reports (which cover all the major disasters) the disasters magnitude to be included in the situation reports remains in the knowledge and wisdom of the Situation Room Duty Officers.

Data and Information Exchange

Given the nature of the activities and the outputs foreseen for the Situation Room, the establishment of a coordination mechanism for improving information exchange among continental, regional, and national authorities, and the development of a harmonised system for warnings at the continental level for informing decision makers and international communities on ongoing and imminent hazards is key.

At present, in the occasion of hazardous events and the need of compiling an informative Event Situation Report, there is a lack of established and formalised procedures for data exchange among situation room duty officers, RCCs, and DRR Focal Points. Particularly, when a considering the collection of data from the field, the system for now relies mainly on the individual professional network of the Situation Room Duty Officers. This is not sufficient to produce quality and timely reports.

First therefore is to develop standardised SOPs for data and information exchange between sectoral EWS at the MS, REC or continental levels guaranteeing a continuous information flow before and during the unfolding of hazardous events. This is a first goal that must be reached exploiting the work of the proposed EW-TWGs.

In the first stage of implementation, the EW-TWGs will concentrate on providing input and technical support for capacity building of existing national, regional, and continental-level

Early Warning Systems related to natural hazards. EW-TWGscan help to ensure that all Early Warning System projects can benefit from lessons learned and data gathered elsewhere, both to deliver immediate benefits and efficiencies for those

individual projects, and to ensure that new warning systems developed may be harmonised within the continental MHEWAS in the long term.

For example, developing standardised SOPs for data and information exchange between sectoral EWS at the Member States, RECs or continental levels will improve the effectiveness of those systems, make it easier to harmonise the different systems later, and reduce the costs and burden of developing separate SOPs for each project.

To foster the data exchange, it is proposed that the AMHEWAS Situation Room will be mandated to interact with all departments and agencies that have an existing mandate to issue early warnings or deliver elements of an Early Warning System.

This includes those departments or agencies responsible for issuing warnings related to natural hazards such as hydrological, meteorological, and geological departments, and their DRR counterparts responsible for risk assessment, warning dissemination and preparedness activities. Although the initial stages of AMHEWAS Development are concentrated on enhancement of early warning for natural hazards, an early contact should be made with counterparts from health, conflict operators within their respective jurisdictions. This will ensure that any opportunities for data sharing, and partnership working can be identified and actioned at an early stage in the Programme, and lessons learned in one sector can be shared with warning system operators in another.

Following the initiation of the Programme, the key priorities for the Regional MHEWAS Programme will be to support strengthening and capacity building at MS level in existing Early Warning Systems, with priorities in Stage 1 (years 1-3 being those warning systems associated with natural hazards. During Stage 1, EW-TWG at regional level will also consider ways of enhancing data and information exchange between MSs, between regional and the continental level, and on operationalising the regional warning system. These tasks include establishment of methodologies for the effective exchange of early warning information and data and identifying and addressing warning system arrangements to tackle transboundary risks.

Formal SOPs should be signed with the different components providing information to the Situation Room and specifically with:

1. African Centre of Meteorological Applications for Development (ACMAD) for the provision of continental bulletins, forecasts, and observations on the hazard of competence of ACMAD.

2. Regional Climate Centres and Specialised Regional Climate Centres for the provision of regional bulletins, forecasts, and observations on the hazard of competence of such RCCs.

3. With the network of regional and national DRR Focal Points for the provision of situational information during events at national and regional scale.

SOPs will also establish the information that will be given back in return by the Situation Room as well as the information sharing modalities. Such SOPs should also foster the collaboration for identifying opportunities for capacity building and continual

improvement of existing sectoral warning systems, concentration initially on those established for natural hazards.

Examples include enhancement of collaboration and information exchange on Early Warning System components between MSs, RECs, and continental levels, and sharing of best practices and lessons learned between the operators of different sectoral warning systems.

Within the described context ICT can facilitate the practical implementation of the data sharing once the proper data sharing policy is in place, reducing the burden for data sharing among institutions.

The use of a unique Information Management System or of multiple interoperable information management systems can be key for the implementation of the data sharing. The Situation Room will be equipped with an open source data sharing platform that can be the starting point in this direction. While it is not needed that all actors at different level adopt the same platform the interoperability concept should be implemented from the start and should be supported by the different technologies used.

As a first step, the crucial necessity to collect information from the field directly from regional and national DRR Focal Points as well as from other important key sources (OCHA, DG ECHO, WFP, International Red Cross, etc.) has led to the preparation of a **Note Verbale**, shared by AUC among Disaster Management Offices, to seek maximum cooperation to avail the most updated information of hazardous events every time there might be the need. The Note Verbale notifies countries that the AUC situation room officers expect maximum and timely cooperation every time a disaster information/confirmation is requested in their respective RECs or countries.

Content of the *Note Verbale*

The African Union Commission (AUC) presents its compliments to the Embassies of African Union Member States and the Ministry of Foreign Affairs of the Federal Democratic Republic of Ethiopia, and has the honour to inform the latter that, as part of operationalisation of the continental Africa Multi-Hazard Early Warning and Early Action System (AMHEWAS) for natural hazards, the AUC is setting up a Situation Room at its Headquarters in Addis Ababa. The AMHEWAS Situation Room is a round-the-clock (24/7) working space where Disaster Risk Reduction experts are to contribute to data collection and analysis for informed decisions and actions that may be required to increase Member States' resilience.

Among others, the Situation Room is to prepare regular Situation Reports to be shared with AUC organs and to facilitate dialogues with member states on anticipatory actions, preparedness, and response. To function effectively, the Situation Room will require provision of timely and regular updates by Member States.

In this regard, the AUC seeks assistance of the Embassies of Member States and Ministry of Foreign Affairs of the Federal Democratic Republic of Ethiopia to request relevant Ministries responsible for Disaster Risk Management in their respective capitals to provide situational updates on disaster risk situations in their respective countries to the AUC on monthly basis. However, when a hazard occurs or has a probability to occur, or during an emergency, the situation update should be sent to AUC at least every 24 hours. All products to be processed by the Situation Room will be made available and accessible to all AUC member States.

The situation updates should be sent to mhewsituationroom@africa-union.org and copy to Mr. Gatkuoth Kai, Technical Coordinator for Disaster Risk Reduction at Kaig@africa-union.org , Mr. Diane Aboubakar at DianeA@africa- union.org, and Mr. Alain Koualao at KoualaoA@africa-union.org.

The Officer at the Situation Room will regularly contact Countries.

Disaster Risk Management Authorities and focal points for information to be included in the Situation Report. Countries are requested to forward names and contacts of at least two (2) Senior Officials who should be contacted during emergencies, and they shall be required to provide all necessary and required information. The Officials will be regarded as country focal points for AUC.

The AUC avails itself of this opportunity to renew to Embassies of African Union Member States and the Ministry of Foreign Affairs of Ethiopia, the assurances of its highest consideration.

Addis Ababa, DD-MM-YYYY

To : All Embassies of AUC Member States, Addis Ababa, Ethiopia
Ministry of Foreign Affairs of the Federal Democratic Republic of Ethiopia

Cc : All National and Regional DRR Experts and Focal Points

Annexure 3 – Indicative Delivery Plan for the AMHEWAS Programme

The following indicative Delivery Plan is intended to inform the Framework. It should be noted that where budget estimates have been included, they are only estimations based on a set of assumptions and cost estimates and therefore are provided only for purposes of illustration. MHEWAS Coordinators and EW-TWGs will be required to refine these broad estimates and present fully-costed proposals to decision makers at their respective levels.

Objective: AMHEWAS Programme approved with political and financial commitment for delivery											
	Activities to be undertaken	Indicators	Budget Estimate (US$)	Responsible Party	Timelines						
					Stage 1		Stage 2			Stage 3	
					Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	**Year 7**
Output 1: Establishment of the Continental MHEWAS Programme											
Activity 1 Initiation of Continental AMHEWAS Programme	Organise continental MHEWAS summit	MHEWAS summit delivered, AMHEWAS Programme initiated	$300,000	AUC	√						
Activity 2 Sensitisation of decision makers	Develop sensitisation materials setting out the benefits of AMHEWAS and demonstrating the positive return on investment	Materials produced in year 1 and revised and updated annually to take account of developments	$1,000,000	AUC	√	√	√	√	√	√	√
	Briefing decision makers at their respective levels on MHEWAS benefits	No. of key decision makers at continental, regional, and national levels received briefings on MHEWAS	$2,000,000	MHEWAS Coordinators	√	√	√	√	√	√	√
Activity 3 Engage dedicated MHEWAS teams	Appointment of continental AMHEWAS team, Appointment of dedicated REC MHEWAS teams	Continental AMHEWAS team appointed REC MHEWAS teams appointed	$3,500,000 (500,000 per year 6 experts, including 1 coordinator)	AUC	√						
	Appointment of dedicated REC MHEWAS teams	REC MHEWAS teams appointed	$14,000,000 (to support RECs without existing MHEWAS)	RECs	√						
	Back-stopping Member States' MHEWAS capacities and capabilities	Additional technical experts appointed by MS to operationalise MHEWAS systems	Lumpsum ($50,000,000)	MS							

Objective: AMHEWAS Programme approved with political and financial commitment for delivery											
	Activities to be undertaken	Indicators	Budget Estimate (US$)	Responsible Party	Timelines						
					Stage 1		Stage 2			Stage 3	
					Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Activity 4 Establishment of EW-TWGs	Identify EW-TWGs Members and formally convene groups	EW-TWGs established at continental, RECs, and MSs levels	Assumed members salary costs will be met by host organizations	AUC, RECs, and MSs	√						
	3 x EW-TWG meetings per year	EW-TWGs meet at least 3 times per year, virtually or in person	$150,000 for meeting and travel costs	AUC, RECs, and MSs	√	√	√	√	√	√	√
Activity 5 Organization of continental biannual AMHEWAS conferences	Organization of continental biannual AMHEWAS conferences	Conferences held in years 3, 5 and 7	$300,000 (100,000 per Conference)	AUC			√		√		√
Output 2: Establishment of common protocols and platforms for sharing data and risk information											
Activity 6 Enhance protocols on hazard, vulnerability & risk assessment	Review of existing protocols on hazard, vulnerability and risk assessment, identification of best practice	Report identifying best practices in hazard, vulnerability, and risk assessment	$100,000	AUC supported by EW-TWGs		√					
	Development of continental, regional, and Member States guidance and protocols on hazard, vulnerability, and risk assessment	Continental, regional, and Member States guidance and protocols developed and adopted	$1,000,000	AUC supported by EW-TWGs		√	√				
Activity 7 Establish MOU for data sharing and risk information	Develop draft MoU for data sharing and risk information, consult with stakeholders at continental, regional, and Member States levels	Draft data sharing policy developed	$50,000	AUC supported by EW-TWGs		√	√				
	Seek agreement on draft MoU at the Biennial AMHEWAS Conference	Data and information sharing agreement ratified	Conference costs to be set out separately				√				
	Procurement and roll out of the common DMIS, including training for users on its operation and maintenance	DMIS operational at continental, RECs, and MSs levels	$600,000	AUC, RECs and MSs				√	√	√	√

Objective: AMHEWAS Programme approved with political and financial commitment for delivery											
	Activities to be undertaken	Indicators	Budget Estimate (US$)	Responsible Party	Timelines						
					Stage 1		Stage 2			Stage 3	
					Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Activity 8 Develop common repository of data and risk information	Develop specifications for a common shared Disaster Management Information System (DMIS) consisting of a web-based GIS platform, with an accessible database to enable different user profiles (forecasters, disaster managers, decision makers) to access information in real-time	Specification for system developed and agreed by key stakeholders	$50,000	AUC in consultation with RECs and MSs, supported by EW-TWGs			√				
	Procurement and roll out of the common DMIS, including training for users on its operation and maintenance	DMIS operational at continental, RECs, and MSs levels	$600,000	AUC, RECs and MSs				√	√	√	√
Activity 9 Support Training and Capacity Building	Undertake MHEWAS training need analysis at at continental, RECs, and MSs levels, propose solutions to address any gaps identified	Report and proposals for training and capacity building at continental, RECs, and MSs levels gap analysis	$400,000	AUC			√	√	√		
	Delivery of Training and Capacity Building Plans at continental, RECs, and MSs levels (including secondment of Member States at continental and regional situation rooms)	Training and capacity building delivered in line with agreed schedule	$15,000,000						√	√	√

Objective: AMHEWAS Programme approved with political and financial commitment for delivery											
	Activities to be undertaken	Indicators	Budget Estimate (US$)	Responsible Party	Timelines						
					Stage 1		Stage 2			Stage 3	
					Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Output 3: Enhancement of round the clock (24/7) hazard monitoring and warning services											
Activity 10 Create Protocols for Exchange of Warnings	Develop protocols for the exchange of warnings at, and between, continental, RECs, and MSs levels	Protocols developed and agreed by AUC, RECs and MSs	$200,000	AUC, RECs, and MSs supported by EW-TWGs		√					
	Training on protocols delivered and systems tested before going live	Protocols for the exchange of warnings go 'live'	$500,000	AUC, RECs, and MSs supported by EW-TWGs.			√				
Activity 11 Establishing the AMHEWAS Situation Room	Finalise facilities and staffing plan, develop supporting protocols and SOPs	Final staffing and facilities plan	Work already underway by AUC-DARBE	AUC	√						
	Train staff, test facilities and systems, and operationalise structure	AMHEWAS Situation Room goes 'live'	$300,000	AUC		√					
Activity 13 Training of Monitoring and Forecasting Practitioners	Undertake training gap analysis for sectoral monitoring and forecasting practitioners	Gap analysis report with recommendations for action at continental, RECs, and MSs levels	100,000	AUC supported by EW-TWGs and international bodies, such as WMO			√				
	Training delivery to address identified gaps	Training delivered at continental, RECs, and MSs levels	To be defined by gap analysis, estimate $600,000	AUC, RECs, and MSs				√	√	√	√
Output 4: Delivery of functional end-to-end warning dissemination and communication systems, including the vital 'last mile' connectivity											
Activity 14 Evaluation and Testing of Warning Dissemination	Evaluation and testing of warning dissemination at continental, REC, and MS levels	Report setting out findings of evaluation and making costed recommendations for improvement as required	100,000	AUC, RECs, and MSs					√		
	Delivery of recommended changes to warning dissemination and communication	Recommendations from evaluation addressed	To be define, around $500,000	AUC, RECs, and MSs						√	√
Activity 15 Establish Warning Dissemination Guidelines and SOPs	EW-TWGs at continental, RECs, and MSs levels develop draft guidelines and SOPs	Draft warning dissemination of guidelines and SOPs developed and agreed by EW-TWG	$200,000	EW-TWG at Continental, REC, and MS levels.		√					

Objective: AMHEWAS Programme approved with political and financial commitment for delivery											
	Activities to be undertaken	Indicators	Budget Estimate (U$S)	Responsible Party	Timelines						
					Stage 1		Stage 2			Stage 3	
					Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
	Guidelines and SOPs adopted by relevant organizations, including sensitisation and training of operators	Guidelines and SOPs operationalised	$100,000	Responsible MDAs at Continental, REC, and MS levels.			√				
Activity 16 Adoption of common alerting protocols (CAP)	SOPs and guidance documents on warning dissemination and communication revised to adopt CAP	Guidelines and SOPs revised	100,000	AUC supported by EW-TWG at continental, RECss, and MSs levels	√						
	Revised documents agreed by relevant MDAs	Revised documents adopted by all relevant MDAs	No cost	Responsible MDAs at continental, RECss, and MSs levels		√					
Activity 17 Deployment of new telecom technologies	Identification of telecom technologies that may assist in effective warning dissemination and communication	Report setting out how suitable telecom technologies that may assist in effective warning dissemination and communication, along with costed programme for their deployment	$150,000	AUC supported by EW-TWGs				√			
	Roll out of recommendations from telecom review	Recommendations in the report are addressed	To be determined (estimate $500,000)	AUC, RECs, MSs					√	√	√
Activity 18 Piloting and adoption of AMHEWAS	Identification of 1 REC and 2 MSs within ome REC to take part in pilot	REC and MSs for pilot identified and agree to take part		AUC					√		
	Organization, delivery, and evaluation of pilot	Pilot delivered and evaluated; report submitted to the concluding biannual AMHEWAS conferences	$200,000	AUC and selected REC and MSs						√	√
Output 5: Development of protocols and materials for preparedness, including planning, training, and exercising											
Activity 19 Prepare multi-hazard early action plans	Develop common protocols, templates, and training to support preparation of multi-hazard early action plans	Common protocols, templates and training materials produced	$100,000	AUC supported by EW-TWGs			√				
	Training and capacity building delivered for representatives from MDAs to enable them to produce plans using the common protocols and templates	Training delivered for delegates at continental, RECs, and MSs levels, enabling them to deliver improved and standardised plans	$500,000	AUC supported by EW-TWGs				√			

Objective: AMHEWAS Programme approved with political and financial commitment for delivery											
	Activities to be undertaken	Indicators	Budget Estimate (US$)	Responsible Party	Timelines						
					Stage 1		Stage 2			Stage 3	
					Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Activity 20 Develop risk sensitisation training materials	Develop a set of risk sensitisation materials for common hazards aimed at decision makers, responders, and communities	Materials developed and agreed by stakeholders	$100,000	AUC supported by EW-TWGs		√					
	Develop an annual programme of risk sensitisation for continental, RECs and MSs levels, including reaching the last mile	Annual programme for risk sensitisation established and delivered at continental, RECs, and MSs levels	$10,000,000	AUC, RECs and MSs			√	√	√	√	√
Activity 21 Develop training for responders on AMHEWAS	Develop a set of training materials on early action for responders	Materials developed and agreed by stakeholders	$100,000	AUC supported by EW-TWGs		√					
	Deliver "Train the Trainer" Programme at continental, RECs and MSs levels	Trainers on early action are trained at continental, RECs, and MSs level	$200,000	AUC, RECs and MSs			√	√	√	√	√
	Deliver localised training at continental, RECs, and MSs levels	Training cascaded at continental, RECs, and MSs levels	$200,000	AUC, RECs and MSs			√	√	√	√	√
Total estimated programme costs			**$70,950,000**								

Table A.3.1 : Indicative Delivery Plan for the AMHEWAS Programme

Annexure 4 – Stakeholders Approached and Interviewed

Organizations approached for information and interview:

1. Arab Maghreb Union (UMA)
2. Southern African Development Community (SADC)
3. Nigeria (CEN-STATEDECOWAS)
4. Egypt (COMESA)
5. Economic Community of West African Studies (ECOWAS)
6. Republic of Djibouti (IGAD)
7. Mauritius (SADC)
8. Uganda (EAC)

Organization	Name	Role
Common Market for Eastern and Southern Africa (COMESA)	Mr. Tapera Henry Chinemhute	Conflict Analyst
	Mr. Salvator Matata	Liaison Officer of COMESA
	Ms. Elizabeth Mutanga	Head of Governance & Peace
	Mr. Mclay Kanyangarara	Climate Change Advisor
Intergovernmental Authority on Development (IGAD)	Dr. Ahmed Amdihun	DRR Specialist
Economic Community of Central African States (ECCAS)	Mr. Semingar Ngaryamngaye	DRR Specialist
	Dr. Pascal Moudi	Climatologist – Climate Forecaster
	Mr. Elie Mbaitoubam	Meteorologist
Morocco (UMA)	Mr. Achraf Hadine	Head of the National Risk Forecasting Centre at the Directorate of Risk Management
	Mr. Hicham Mharzi-Alaoui	Head of the National Risk Observatory at the National Center for Climatic and Forest Risk Management
	Ms. Salma El Amrani	Executive at the Directorate
Gabon (ECCAS)	Ms. Sidonie Motombi	Member of the Permanent Secretariat – Expert in DRR
	Mr. Charles Mangouba	Member of the Permanent Secretariat – Expert in DRR
	Ms. Rosine Loumby Mpiga	Deputy DG Civil Protection, NDMA
	Mr. Vassily Conan Obame	Geotechnical Focal Point
	Ms. Marguerite Sandra Akendengu	Health Expert
Sierra Leone (ECOWAS)	Mr. John Vandi Rogers	Head of the National DRM Agency
African Centre of Meteorological Application for Development (ACMAD)	Dr. Andre Kamaga	Director
	Mr. Godefroy Nshimirimana	Meteorologist

Annexure 5 – Schedule of Interviews with National Focal Points of Eight Member States (one per REC)

This Annexure includes a schedule of interviews between CIMA Research Foundation and the National Focal Points (NFPs) of eight AUC Member States (one per REC) as part of data collection, study. These were follow-up validation interviews, conducted after the preexisting EWS evaluation tool had been populated by the nominees (i.e. the NFPs).

	Serial Number	MS	Date	Day of week	Local Time	CET Time	Focal Point
INTERVIEWTIME SCHEDULE - MS	1	Morocco (UMA)	15 March 2021	Monday	10:00	10:00	Mr. Mohammed Jarefa
	2	Nigeria (CEN-SAD)	15 March 2021	Monday	14:00	14:00	Ms. Aisha Ibrahim Musa
	3	Egypt (COMESA)	16 March 2021	Tuesday	10:00	09:00	Mr. Abdel Samea Mohamed
	4	Uganda (EAC)	16 March 2021	Tuesday	14:00	12:00	Ms. Pamela Komujuni Kalule
	5	Republic of Djibouti (IGAD)	17 March 2021	Wednesday	10:00	08:00	Mr. Ahmed Mohamed Madar
	6	Mauritius (SADC)	17 March 2021	Wednesday	14:00	11:00	Mr. Heman Bissessur
	7	Sierra Leone (ECOWAS)	18 March 2021	Thursday	10.00	11:00	Mr. John Vandi Rogers
	8	Gabon (ECCAS)	18 March 2021	Thursday	14:00	14:00	Ms. Hortense Togo Moussounda

Annexure 6 – Schedule of Interviews with National Focal Points at the Eight Regional Economic Committees

This Annexure includes a schedule of interviews between CIMA Research Foundation and the National Focal Points (NFPs) of the eight Regional Economic Committees.

Table A.6.1: Schedule of interviews with NFPs at eight RECs

		RECs	Location / Headquarters	Date	Day of week	Local Time	CET Time	Focal Point
INTERVIEW TIME SCHEDULE - RECs	1	Arab Maghreb Union (UMA)	(Rabat) Morocco	8 March 2021	Monday	10:00	10:00	Mr. Abdi Sidi Mohamed
	2	Common Market for Eastern and Southern Africa (COMESA)	(Lusaka) Zambia	8 March 2021	Monday	14:00	13:00	Mr. Tapera Henry Chinemhute
	3	East African Community (EAC)	(Arusha) Tanzania	9 March 2021	Tuesday	10:00	08:00	Mr. Leonidas Ladislaus Kyaruzi
	4	Community of Sahel-Saharan States (CEN-SAD	(Tripoli) Libya	9 March 2021	Tuesday	14:00	13:00	Ms. Shahira Wahbi
	5	Southern African Development Community (SADC)	(Gaborone) Botswana	10 March 2021	Wednesday	10:00	09:00	Ms. Sithembiso Gina
	6	Intergovernmental Authority on Development (IGAD)	(Djibouti) Republic of Djibouti	10 March 2021	Wednesday	14:00	12:00	Mr. Keflemaria m Sebhatu
	7	Economic Community of Central African States (ECCAS)	(Libreville) Gabon	11 March 2021	Thursday	10.00	10:00	Mr. Semingar Ngarymn Gaye
	8	Economic Community of West African States (ECOWAS)	(Abuja) Nigeria	11 March 2021	Thursday	14:00	14:00	Mr. Mohammed Ibrahim

Annexure 7 – Simplified Self-assessment Tool for Member States and RECs

Primary data collected via a simplified self-assessment tool, in the form of a survey questionnaire that was administered to the Member States

Purpose of questionnaire

This questionnaire will guide Stakeholders at the National and REC level to undertake a self-assessment of their current Early Warning System capabilities and capacities. This self-assessment, along with any supporting documents provided, will be used to assist in a detailed analysis of the status of Early Warning and preparedness at the Continental level, and at the level of Regional Economic Communities (RECs) and Member States. This is essential to ensure that Africa's Institutional and Operational Framework To Implement Multi-hazard Early Warning System is fully contextualised to Africa's immediate needs and priorities.

Structure of the questionnaire[15]

The questionnaire is structured around the essential components of an Early Warning System described in the World Meteorological Organization (WMO) document; Multi-Hazard Early Warning Systems: A Checklist. The Checklist describes the four components required for and efficient, people-centered Early Warning System, namely: disaster risk knowledge, monitoring and forecasting; warning dissemination and communication; and preparedness and response.

In addition to these four components, MHEWAS require an institutional and financial framework to ensure systems are coordinated and sustainable. Key questions on this fifth overarching requirement are taken from the 2006 Checklist produced at the 'Third International Conference on Early Warning'.

The questionnaire is a self-assessment, by the respondents from RECs and Member States, on their current arrangements for Early Warning. At the end of the questionnaire, there is a facility to upload any supporting evidence, such as copies of legislation, plans or Standard Operating Procedures.

Survey Form

Identification of the Respondent	Identification of the Respondent
Country:	Name:
Rec:	Job / Role Title:
Date:	Email:

15 More information on the check-lists and background reference materials can be found at:
a) https://library.wmo.int/doc_num. php?explnum_id=4463 , and
b) https://www.unisdr.org/2006/ppew/info- resources/ewc3/checklist/English.pdf

Response Scores

In response to each question, please allocate a self-assessment score ranging from 1-4 based on the following evaluation statements. For further information about requirements, for topics 1-4, please refer to the WMO document; Multi-hazard Early Warning Systems: A Checklist. This can be found at: https://library.wmo.int/doc_num.php?explnum_id=4463

For topic 5, Governance and Institutional Framework, please refer to Developing Early Warning Systems: A Checklist 2006 produced at the Third International Conference on Early Warning (EWC III). This can be found at: https://www.unisdr.org/2006/ppew/info-resources/ewc3/checklist/English.pdf

Score	Description
1	Requirement not currently met. The current arrangements do not comply with international standards and good practices. Ongoing initiatives to strengthen either do not exist or will not be sufficient to make it compliant.
2	Requirement Partly Met. The current arrangements do not comply with international standards and good practices. Ongoing initiatives and planned investment should be sufficient to make it compliant.
3	Requirement is met. The current arrangements comply with standards. Recommendations and reference good practices.
4	Requirement is exceeded. The current state arrangements exceed international standards, recommendations and reference good practices and may provide a model for others to copy.

Additional Comments

Each section also provides space to add any comment of explanation you think may be valuable to the assessment team. At the end of the questionnaire there is a facility to upload any supporting evidence, such as copies of legislation, plans or Standard Operating Procedures.

Topic. 1 Disaster Risk Knowledge

1.1 Are key hazards and related threats identified?

- Characteristics of key hazards (e.g. geographical extent, magnitude, intensity, disease transmissibility, frequency, probability), including possible cascading hazardous events, are analysed, historical data evaluated and potential future risks assessed
- Hazard Maps (dynamic and multi-hazard, when possible) are developed that identify the geographical areas/people that could be affected by hazards

Score 1-4

1.2 Are exposure, vulnerabilities, capacities, and risks assessed?

- Assessment and quantification of exposed people, services (e.g., hospitals) and critical infrastructure
- (e.g., electricity and water works, quality of building stock) conducted and mapped for all relevant hazards, as well as of any compounding risks, at Local level in both rural and urban areas and coastlines
- Impacts to critical infrastructure and secondary risks associated with these impacts are evaluated, and risk management solutions considered to increase resilience
- Vulnerability factors such as gender, disability, access to infrastructure, economic diversity, societal inequalities, and environmental sensitivities considered
- Vulnerabilities of key economic sectors at National to Local levels assessed
- Historical and indigenous knowledge integrated into risk assessments
- Activities that increase or compound risks (e.g., urbanization and land use) identified and evaluated
- Risk assessment results integrated into Local Risk Management Plans and Warning Messages in a clear and easy-to-understand language with attention to how different people assess information
- Legislation and cultural norms assessed to identify gaps that may increase vulnerability

Score 1-4
Please add any comment or additional Information:

1.3 Are roles and responsibilities of stakeholders identified?

- Key National Government Agencies involved in Risk Assessments (*including hazard, vulnerability, and capacity assessments*) are identified and roles defined
- Legislation or Government Policy mandating the preparation of hazard, vulnerability, and capacity assessments for all areas are in place
- Responsibility for coordinating hazard identification and risk information (*exposure, social and physical vulnerability and capacity*) assigned to one National Organization with a view to consolidating approaches and monitoring linkages and cascading impacts
- Process developed for scientific and technical experts to assess and review the accuracy of risk data and information. Process developed to actively engage rural and urban communities in Local hazard and risk assessments taking into consideration the needs of all people (*women, children, older people, people with disabilities, etc.)*

Score 1-4
Please add any comment or additional Information:

1.4 Is risk information consolidated?

- Central standardised repository (*including but not limited to a Geographic Information System*) established to store all event/disaster and risk information
- National Standards (*where possible, following international standards*) established for the systematic collection, sharing and assessment of risk information and data related to hazards, exposures, vulnerabilities, and capacities
- Standardized vulnerability data and information disaggregated by sex, age, and disability
- Process established to maintain, regularly review, and update risk data, including information on any new or emerging vulnerabilities and hazards, with roles and responsibilities of Stakeholders identified along with appropriate funding

Score 1-4
Please add any comment or additional Information:

1.5 Is risk information properly incorporated into the Early Warning System?

- Information on the geographical extent of hazards used to define safe areas and evacuation zones
- Risk information on vulnerable groups (hazard, exposure, differential vulnerability) used to identify and define evacuation routes and location of temporary shelters
- Risk information on different types of assets reviewed to outline procedures to minimize damage or loss of such assets once a warning is issued
- Process established for continuous update on new or emerging risks (*e.g. due to urban expansion or establishment of new settlements*) and potential changes to some hazards (*due to changes in land use*) to update safe areas, evacuation zones and shelters

Score 1-4
Please add any comment or additional Information:

Topic. 2 Detection, monitoring, analysis, and forecasting of the hazards and possible consequences.

2.1 Are there monitoring systems in place?

- Monitoring network established that monitors hazards that impact the country
- Measurement parameters and specifications documented for each relevant hazard
- Technical equipment, suited to Local conditions and circumstances, in place and personnel trained in its use and maintenance
- Monitoring data received, processed and available in an interoperable format in real time or near real time monitoring data and metadata routinely curated with quality controls, archived and accessible for verification, research purposes and other applications
- Monitoring hardware and software maintenance conducted routinely and costs and resources considered from the beginning to ensure optimal operation of the system over time
- The system can combine and benefit from new and older technology allowing for exchange of data among countries with different technical capabilities

Score 1-4
Please add any comment or additional Information:

2.2 Are there forecasting and warning services in place?

- Data analysis and processing, modelling, prediction, and warning products generated based on accepted scientific and technical methodologies and disseminated within International standards and protocols
- New data analysis and processing, modelling, prediction, and warning products can be integrated easily in the system as science and technology evolve
- Warning Centres are operational at all times (24 hours/day, seven days/week) and staffed by trained personnel following appropriate National and International standards

- Warning Messages are clear, consistent and include risk and impact information and are designed with consideration for linking threat Levels to emergency preparedness and response actions
- Software and data analysis for the received data updated periodically and to high security standards. The state of the monitoring and data analysis systems continuously monitored for any data gaps, connection issues or processing issues
- Warnings generated and disseminated in an efficient and timely manner for each type of hazard Warning System(s) subjected to regular system- wide tests and exercises

Score 1-4
Please add any comment or additional Information:

2.3 Are there Institutional Mechanisms in place?

- Plans and documents for monitoring networks available and agreed upon with experts and relevant Authorities
- Standardized process, and roles and responsibilities of all Organizations generating and issuing warnings established and mandated by legislation or other Authoritative instrument (e.g., memorandum of understanding (MOU), Standard Operating Procedures)
- Agreements and inter agency protocols established within country for exchange of monitoring systems data and baseline data needed for certain data products (e.g., bathymetric, and topographic data for tsunami modelling)
- Agreements and inter agency protocols established to ensure consistency of warning language and communication responsibilities where different hazards are handled by different agencies.
- A Multi-Hazard coordination strategy established to obtain mutual efficiencies and effectiveness among different Warning Systems
- Warning System partners, including Local Authorities and the media, are aware of and respect which Organizations are responsible for generation and issuance of warnings
- Cross-border exchange of warnings and observation data realized through bilateral/ multilateral agreements, especially for concerns such as tropical cyclones, floods, diseases, shared basins, data exchange, and technical capacity-building

Score 1-4
Please add any comment or additional Information:

Topic. 3 Warning dissemination and communication

3.1 Are Organizational and decision-making processes in place and operational?

- Functions, roles, and responsibilities of each actor in the warning dissemination process enforced through government policy or legislation at all Levels and included in the standard operating procedures
- Warning communication strategies at the National, Sub-National, and Local levels in place that ensure coordination across warning issuers and dissemination channels
- Regular coordination, planning and Review Meetings between the warning issuers, the media, and other Stakeholders
- Professional and volunteer networks established to receive and disseminate warnings widely.
- Feedback Mechanisms in place to verify that warnings have been received and to correct potential failures in dissemination and communication
- Mechanisms to update the information are in place and are resilient to the event

Score 1-4
Please add any comment or additional Information:

3.2 Are communication systems and equipment in place and operational?

- Trust between Stakeholders established
- Communication and Dissemination Systems tailored to the different needs of specific groups (*urban and rural populations, women and men, older people and youth, people with disabilities, etc.)*
- Understanding of last mile connectivity to know which population groups can be reached by different services, including mobile-cellular, satellite and radio services
- Warning Communication and Dissemination Systems reach the entire population, including seasonal populations and those in remote locations, through multiple communication channels (*e.g., satellite and mobile-cellular networks, social media, flags, sirens, bells, public address systems, door-to-door visits, community meetings)*
- Communication strategies evaluated to ensure messages are reaching the population
- Agreements developed to utilise private sector resources where appropriate (*e.g., mobile- cellular, satellite, television, radio broadcasting, amateur radio, social media)* to disseminate warnings
- Equipment maintained and upgraded to utilise new technologies (when appropriate) to ensure interoperability
- Backup systems and processes in place in the event of failure
- Resilience of communication channels and Early Warning System hardware evaluated in advance to reduce the impact of events on the infrastructure
- Coverage of communication channels and multiple-channel systems assessed to identify gaps and possible points of failure that may increase vulnerability

Score 1-4
Please add any comment or additional Information:

3.3 Are Impact-Based Early Warnings communicated effectively to prompt action by target groups?

- Warning Messages provide clear guidance to trigger reactions (*e.g., evacuation*)
- In the case of events with a short timeframe for reaction (*e.g., earthquake Early Warning*), automated systems should be in place to mitigate impacts (*e.g., automatic stop of transport, activation of red lights in tunnels, stopping elevators on the closest floor, opening of fire- truck gates, etc.)*
- Early Warnings should consider the different risks and needs of sub-populations, including differential vulnerabilities (*urban and rural, women and men, older people and youth, people with disabilities, etc.*)
- Public and other Stakeholders are aware of which Authorities issue the warnings and trust their message

Score 1-4
Please add any comment or additional Information:

Topic. 4 Detection, monitoring, analysis, and forecasting of the hazards and possible consequences.

4.1 Are disaster preparedness measures, including response plans, developed and operational?

- Disaster preparedness, including plans or Standard Operating Procedures, developed in a participatory manner, disseminated to the community, practiced, and underpinned by legislation where appropriate. Disaster preparedness measures, including plans and standard operating procedures, account for the needs of people with different degrees of vulnerability
- Multi-Hazard Risk Assessments utilised to develop and design evacuation strategies (*evacuation routes, demarcation of safe areas and location of temporary shelters, use of vertical evacuation if needed)*

- Community's ability to communicate in response to Early Warnings assessed
- Contingency planning developed in a scenario-based manner following forecasts or likely scenarios across different timescales and informed by climate projections and scientific research
- Early Action and response options across time and geographical scales are linked to the provision of funding to support them
- Strategies implemented to maintain preparedness for longer return-periods and cascading Hazard Events
- Protocols incorporated in the plans or Standard Operating Procedures to reach emergency and health services that need to be ready to respond to events promptly
- Protocols established to activate and mobilize last-mile operators (e.g., Local police, fire-fighters, volunteers, health services) who disseminate warnings to the public and decide public measures, including issuing orders for evacuation or sheltering in place
- Regular exercises undertaken to test and optimize the effectiveness of Early Warning dissemination processes, preparedness, and response to warnings

Score 1-4
Please add any comment or additional Information:

4.2 Are public awareness and education campaigns conducted?

- Ongoing public awareness and education programs on hazards that could impact the population, vulnerabilities, exposure and how to reduce disaster impacts built into school curricula from primary through university
- Public education provided to recognize Hydro meteorological and Geophysical Hazard Signals and disease signs and symptoms in order to contribute to community surveillance and to allow and promote robust no-regret response measures
- People educated on how warnings will be disseminated, which sources are reliable and how to respond
- Utilisation of the most effective media (*e.g., established broadcasting media, social networks, alternative media*) to improve public awareness
- Public awareness and education campaigns tailored to the specific needs of vulnerable groups *(e.g., women, children, older people, and people with disabilities*)

Score 1-4
Please add any comment or additional Information:

4.3 Are public awareness and response tested and evaluated?

- Previous emergency and disaster events and responses analysed, and lessons learned incorporated into preparedness and response plans and into capacity-building strategies
- Public awareness strategies and programs evaluated regularly and updated as required

Score 1-4
Please add any comment or additional Information:

Topic. 5 Governance and Institutional Arrangements

5.1 Early Warning secured as a Long Term National and Local Priority

- Economic benefits of Early Warning highlighted to senior Government and Political Leaders using practical methods such as a cost-benefit analysis of previous disasters
- Examples and Case Studies of successful Early Warning Systems disseminated to senior government and political leaders
- Early Warning role models or "champions" engaged to advocate Early Warning and promote its benefits
- The priority Natural Hazard Risk requiring an Early Warning system identified, and operational arrangements within a Multi-Hazard Framework established
- Early Warning integrated into National economic planning

Score 1-4
Please add any comment or additional Information:

5.2 Legal and Policy Frameworks to support Early Warning Established

- National Legislation or Policies developed to provide an institutional and legal basis for implementing Early Warning Systems
- Clear roles and responsibilities defined for all Organizations (*government and nongovernment*) involved in early warning
- Overall responsibility and authority for coordination of early warning assigned to one national agency
- One political leader or senior government official empowered by law as national decision maker

- Policies developed to decentralise Disaster Management and encourage community participation
- Local decision-making and implementation of Early Warning Systems placed within broader administrative and resource capabilities at the national or regional level
- Regional and cross-border agreements established to ensure Early Warning Systems are integrated where possible
- Relationships and partnerships between all organizations involved in early warning institutionalised and coordination mechanisms mandated
- Early Warning integrated into Disaster Reduction and Development Policies. Monitoring and enforcement regime

Score 1-4
Please add any comment or additional Information:

5.3 Institutional Capacities Assessed and Enhanced

- Capacities of all Organizations and Institutions involved assessed and capacity building plans and training programmes developed and resourced
- Non-Governmental sector engaged and encouraged to contribute to capacity building

Score 1-4
Please add any comment or additional Information:

5.4 Financial Resources Secured

- Government funding mechanism for Early Warning and disaster preparedness developed and institutionalised
- Access to funding at the International or Regional level explored. Public/private partnerships utilised to assist with Early Warning system developments

Score 1-4
Please add any comment or additional Information:

Additional Information

Please upload copies of relevant supporting Plans and Legislation relating to Early Warning Systems or provide a link to where these may be downloaded. We are particularly interested in the following documents where they exist :

1. National legislation relating to disaster risk management or civil protection
2. National legislation relating to establishment of National Meteorological Service
3. National legislation relating to establishment of National Hydrological Service or Water Resources Ministry
4. Any legislation or policy documents specifically relating to the provision of Early Warning Systems
5. Any plans or standard operating procedures setting out how the four components of an Early Warning System, and the various Ministries, Departments or Agencies responsible for each, will be coordinated

Thank you very much for your time and collaboration. The information that has been provided will help to shape the Africa Institutional and Operational Framework to implement a Multi-Hazard Early Warning System. We will keep you updated on progress and next steps.

Annexure 8 – List of Workshops

The below-mentioned workshops were conducted (in Stages 1 through 4 of the methodology) by CIMA as multi-stakeholder engagements to introduce, build-upon, and further refine the Framework document.

Table A.8.1: Schedule of workshops conducted in the process of developing the Institutional and Operational Framework for MHEWAS

Serial Number	Workshop	Date	Place	Objective
1	Inception Workshop	23 February 2021	Virtual	Introduction to the project, stakeholder engagement for data collection on EWS
2	Consultation Workshop (EN)	01 June 2021	Virtual	Seek feedback from stakeholders on draft proposals for the Operational Framework for Multi-Hazard Early Warning and Early Action System (MHEWAS)
3	Consultation Workshop (FR)	07 June 2021	Virtual	Seek feedback from stakeholders on draft proposals for the Operational Framework for Multi-Hazard Early Warning and Early Action System (MHEWAS)
4	Validation Workshop	26 July 2021	Virtual	Seek input and feedback from stakeholders on the First Draft Operational Framework for Multi-Hazard Early Warning and Early Action System (MHEWAS)
5	Final Endorsement Meeting	20–22 September 2021	Nairobi, Kenya	Presentation and finalisation of the Institutional Framework, endorsement of the process

Annexure 9 – Agenda for the Inception Workshop

Inception Workshop (Stage 1 of Methodology – Assessment of Existing Early Warning Systems)

When : Tuesday, 23 February 2021
14:00 – 16:00 hours EAT

Where : Virtual (Zoom) Workshop – interactive session held online; , no registration required

Objective : To introduce the project and assessment survey questionnaire to the stakeholders for data collection on status of their respective Early Warning Systems.

Agenda

Time (EAT)	Agenda Item
14:00	Introductions and Protocol
14:10	Overview for the Workshop and Project
14:15	Overview of EWS Challenges and Opportunities for Improvement
14:20	Introduction to the CIMA Evaluation Tool
14:35	Introduction to the CIMA Self-Assessment Tool
14:50	Next Steps and Project Requirements
15:00	Plenary Discussions and Questions
15:30	Concluding Remarks

Annexure 10 – Agenda for the Consultation Workshops

Consultation Workshop (conducted in English and French)

(Stage 3 of Methodology – Development of Final Draft Institutional and Operational Framework)

When : Tuesday, 01 June 2021 (English)
Monday, 07 June 2021 (French)
10:00 – 11:30 hours EAT

Where : Virtual Workshop

Objective : To seek input and feedback from stakeholders on draft proposals for an Operational Framework for Multi-Hazard Early Warning and Early Action System (MHEWAS)

Agenda

Time (EAT)	Agenda Item	Lead Responsibility
10:00 – 10:05	Introductions and Welcoming Remarks	AUC / UN
10:05 – 10:20	Summary of the assessment of current MHEWS	CIMA
10:20 – 10:30	Overview of the proposed Framework structure	CIMA
10:30 – 10:50	Framework objectives and principles	Group Discussion
10:50 – 11:10	Overview of roles and responsibilities of AUC, REC & MS	Group Discussion
11:05 – 11:25	Operationalizing the Framework	Group Discussion
11:25 – 11:30	Closing Remarks	AUC / UN

Annexure 11 – Agenda for the Validation Workshop

Validation Workshop

(Stage 4 of Methodology – Validation of the Framework)

When : Monday, 26 July 2021
13:00 EAT

Where : Virtual Workshop

Objective : To seek input and feedback from stakeholders on the First Draft Operational Framework for Multi-Hazard Early Warning and Early Action System (MHEWAS)

Agenda

Time (EAT)	Agenda Item	Lead Responsibility
13:00 – 13:10	Introductions and Welcoming Remarks	AUC / UN
13:10 – 13:20	Overview of the proposed Framework contents & structure	CIMA
13:20 – 13:40	Overview of Proposed Institutional Role and Responsibilities	CIMA
13:40 – 14:00	Stakeholder discussion Roles and Responsibilities	Group Discussion
14:00 – 14:20	Overview of the Operational Framework	CIMA
14:20 - 14:40	Stakeholder discussion the Operational Framework	Group Discussion
14:40 – 14:50	Roadmap for Operationalizing the Framework and Next Steps	CIMA
14:50 - 15:00	Closing Remarks	AUC / UN

Annexure 12 – Agenda for the Final Endorsement Meeting

Final Endorsement Meeting

(Stage 4 of Methodology – Validation of the Framework)

When : 20 – 22 October 2021

Where : In-person three-day meeting in Nairobi, Kenya

Objective : The final endorsement under the auspices of a three-day MHEWAS conference brings together Disaster Risk Reduction and Early Warning Experts from AU Member States, RECs and relevant stakeholders to provide critical inputs into the Draft AMHEWAS institutional framework, Draft Standard Operating Procedures and Draft Data Sharing Policy. CIMA Team will present the revised final draft Framework, which will be discussed in plenary and working sessions where delegates provide oral and written comments on the Framework. All comments and requests for modification will then be included in a revised final version of the Framework to be submitted to the AUC for a final validation.

The Conference is a milestone in the operationalisation of the AMHEWAS Situation Room, which is set to be inaugurated in 2021.

Agenda

Day 1 : Wednesday, 20 October 2021

Time (EAT)	Agenda Item
08:30 – 09:00	Registration
0900 – 09:30	Welcoming remarks Lead: UNDRR & AUC
09:30 – 10:00	Objectives of the conference Introduction of participants/delegates Expectations
10:00 – 10:15	Setting the Scene: MHEWAS in Africa
10:15 – 11:00	MHEWAS Institutional Framework Presenter: CIMA
11:00 – 11:30	Health Break
11:30 - 13:00	Breakout Sessions Moderator: CIMA The groups are: IGAD/EAC, SADC, ECOWAS, ECCAS, and UMA International partners, CSO, academia (AfSTAG), youth (AYAB), and women networks
13:00 -14:00	Lunch Break
14:00 -16:30	Breakout sessions continue The groups are: IGAD/EAC, SADC, ECOWAS, ECCAS, and UMA International partners, CSO, academia (AfSTAG), youth (AYAB), and women networks
16:30 – 17:00	Logistics facilitations, health break and closure

Day 2 : Thursday, 21 October 2021

Time (EAT)	Agenda Item
09:00 – 10:30	Breakout Sessions continue
10:30 – 10:45	Health break
10:45 – 13:00	Group Presentations Technical Validation of the MHEWAS Framework
13:00 – 14:00	Lunch Break
14:00 – 14:30	COVID-19 Recovery Framework for Africa Presenter : Dr. Nyandiko
14:30 – 17:30	Group work: Standard Operating Procedures for the AMHEWAS Situation Room Moderator : AUC The groups are: IGAD/EAC, SADC, ECOWAS, ECCAS, and UMA International partners, CSO, academia (AfSTAG), youth (AYAB), and women networks
17:30 – 17:45	Day 2 wrap up

Day 3: Friday, 22 October 2021

Time (EAT)	Agenda Item
09:00 – 10:30	Group Presentations on the Review of the SOPs Moderator : AUC
10:30 – 10:45	Health break
10:45 – 11:30	Data Sharing Policy for the MHEWAS Framework Presenter : AUC
11:30 – 12:00	International data sharing policy Experience: WMO
12:00 – 12:30	Data Sharing Policy experience: African Experience AUC – CEWS AUC - Africa CDC (Epidemics Intelligence)
12:30 -13:00	Group Work: Data sharing policy for MHEWAS Moderator : AUC The groups are: IGAD/EAC SADC ECOWAS ECCAS, and UMA International partners, CSO, academia (AfSTAG), youth (AYAB) and women networks
13:00 -14:00	Lunch
14:00 – 14:30	Group Presentations on the Draft Data Sharing Policy Moderator : AUC
14:30 – 15:00	Operationalisation of AMHEWAS Situation Room: Way forward Moderator: AUC
15:00	Closure