



ICPAC

**IGAD Institutional and
Operational Framework for
Multi-Hazard Early Warning
and Early Action**

IGAD Institutional and Operational Framework for Multi-Hazard Early Warning and Early Action

funded by the Government of Sweden

Contents

A Guide to Common Key Terminology used in MHEWS Development.....	5
Chapter 1.....	11
Introduction and Overview	
1.1 Introduction.....	12
1.2 International Guidance Relating to MHEWS.....	13
1.3. Africa’s Continental Guidance on MHEWS	16
Chapter 2.....	17
Requirements for an Efficient IGAD MHEWS	
2.1 General Provisions for MHEWS Legal and Institutional Arrangements.....	18
2.2 Guiding Principles for the IGAD Regional MHEWS	19
Chapter 3.....	22
IGAD MHEWS Roles and Responsibilities	
3.1 Overview of Current Roles and Responsibilities.....	23
3.1.1 Overview of Current Roles and Responsibilities.....	23
3.1.2 Role of Existing Regional Hazard Monitoring Departments and Agencies	24
3.1.3 Role of Existing National Hazard Monitoring Departments and Agencies	25
3.2 Proposed Roles Under the IGAD Framework.....	26
3.3 Responsibilities for Delivery of the IGAD MHEWS Development Program	28
Chapter 4.....	29
IGAD MHEWS Regional Operational Framework	
4 IGAD MHEWS Regional Operational Framework.....	30
4.1 Enabling Environment for Operation of an effective IGAD MHEWS.....	30
4.1.1 Strong Political and Financial Commitment.	31
4.1.2 Institutional Cohesion among all Early Warning Components.	31
4.1.3 Clearly defined Roles and Responsibilities of all Stakeholders.	32
4.1.4 Resource Allocation.	32
4.1.5 Risk Mapping.	34
4.1.6 Ensuring warnings address the needs of those required to act.....	34
4.1.7 Accurate, timely, and effective warning and dissemination.	34
4.1.8 Integration of MHEWS into response planning.....	34
4.1.9 Early warnings mainstreamed in relevant public awareness and educational programmes.....	35
4.1.10 Feedback.....	35
4.2 Overview of the IGAD MHEWS Model	35
4.3 MHEWS Warning Tiers at IGAD, National and Sub-National Levels.....	36
4.4 IGAD / IDOC Regional Roles and Responsibilities	39
4.4.1 IDOC Links with Continental and National Level.....	40
Chapter 5.....	42
Model National MHEWS Operational Framework	
5.1 National Level Roles and Responsibilities for MHEWS.....	43
5.2 Recommendations for Operationalization of the Regional MHEWS Model at National Level.....	45
5.2.1 Establishing a National MHEWS Lead Agency	47
5.2.2 Setting Up 24/7 MHEWS Situation Rooms.....	48
5.2.3 Training and Capacity Building for the National MHEWS Situation Room.....	49
5.2.4 Establishing Working Arrangements at and Between National Level and IDOC.....	49
5.2.5 Communication and dissemination arrangements.....	50

Chapter 6	53
IGAD Program for Development of MHEWS	
6.1 Overview of the IGAD Program for Development of MHEWS.....	54
6.2 Delivering the IGAD Program.....	55
6.3 Governance Arrangements for the IGAD MHEWS Program.....	57
6.3.1 Appointment of MHEWS Coordinators.....	58
6.3.2 Roles and Responsibilities of the MHEWS Coordinator.....	60
6.3.3 Establishment of Early Warning Technical Working Groups (EW-TWG).....	61
6.3.4 Terms of Reference of the Early Warning Technical Working Groups (EW-TWG).....	61
6.4 Coordination and decision-making meetings to direct the IGAD MHEWS Programme ..	63
 Chapter 7	 64
Draft Implementation Plan for the IGAD MHEWS Program	
7.1 Implementation Plan for IGAD MHEWS Programme.....	65
List of Annexes	66
 List of Annexes.....	 67
Annex 1 - Indicative IGAD MHEWS Programme Delivery Plan.....	68
Annex 2 - Binding and non-binding instruments creating the conditions for a functioning continental MHEW and Early Action system.....	77

Figures and Tables

<i>Figure 1: Schematic of a Multi-Hazard Early Warning System.</i> <i>Source: Multi-Hazard EWS Checklist 2017</i>	15
<i>Figure 2: Four Essential Components of an MHEWS</i> <i>Source and required governance arrangements: Multi-Hazard EWS Checklist 2017.</i>	15
<i>Figure 3: Overview of the CEWARN System</i>	25
<i>Figure 4: Examples of benefits delivered through investment in resilience</i> <i>(Apergi, Wilkinson & Calderone 2020)</i>	33
<i>Figure 5: High Level summary of Regional MHEWS Functional Responsibilities</i>	35
<i>Figure 6: Schematic Diagram of the 3 Tiers of the IGAD MHEWS</i>	37
<i>Table 1: IGAD MHEWS Warning Activation Criterion</i>	38
<i>Table 2: IGAD Level Responsibilities for MHEWS</i>	40
<i>Figure 7: IGAD Regional MHEWS Structure</i>	41
<i>Table 3: National Responsibilities for MHEWS</i>	44
<i>Figure 8: Illustrative Long Term MHEWS Structure at MS level.</i>	46
<i>Figure 9: Example Structure of MHEWS</i> <i>Within a typical EOC Facility at Member State Level</i>	48
<i>Figure 10: Overview of MHEWS Program</i>	56
<i>Figure 11: MHEWS Governance Structure - Continental Overview</i>	57
<i>Figure 12: MHEWS Example Governance Structure - National Overview</i>	58

A Guide to Common Key Terminology used in MHEWS Development.

Academic Sector: Public and private high education establishments and non-profit research institutions.

Business Plan: A roadmap for an organization outlining goals and how those goals will be achieved – it can be used to justify increased financing.

Business Model: Describes how an organization creates, delivers and captures value.

Concept of Operations: A document describing the characteristics of a proposed system from the viewpoint of an individual who will use that system.

Common Alerting Protocol (CAP): A simple but general format for exchanging all-hazard emergency alerts and public warnings over all kinds of ICT networks, allowing a consistent warning message to be disseminated simultaneously over many different warning systems, thus increasing warning effectiveness while simplifying the warning task. It also enables authorities to deliver early warnings and alerts to all people and communities at risk, and up to global scale using different technologies .

Disaster Risk Management: Generally abbreviated as DRM, includes several interrelated activities: (i) risk identification, which informs the design of other risk management actions; (ii) reducing risk, by avoiding the creation of new risk and reducing existing risks; prepare for the residual risk, either (iii) physically (preparedness), or (iv) financially (financial protection); and (v) resilient recovery and reconstruction, by building-back-better after a disaster.

Early Warning System: A system designed to initiate and support Early Actions to avoid an emergency or disaster or mitigate its impacts. An Early Warning System must include, as a minimum, the following four component elements; (i) Risk Knowledge: mapping and assessment of data on hazards, exposure, and vulnerabilities; (ii) Monitoring and Warning: determining the hazards to be monitored and putting systems in place for their monitoring, then issuing a warning once agreed parameters have been breached; (iii) Dissemination and Communication: Ensuring that any warning to communities and Stakeholders is delivered effectively so that they can take Early Actions; and (iv) Response

Capability: An effective response by individuals, communities, government and other institutions.

Emergency Preparedness and Response: Generally abbreviated as EP&R, 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 timescales of hours to years. Forecasts are often referred to as nowcasts (from 0 to 6 hours), very-short-range weather forecasts (up to 12 hours), short-range weather forecasts (from 12 to 72 hours), medium-range weather forecasts (from 3 to 10 days), extended-

range weather forecasts (from 10 to 30 days), and long-range forecasts (from 30 days to 2 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).

Global Weather Enterprise: A term coined to describe the totality of activities by individuals and organizations to enable weather information to be created and provided to society. It encompasses the public, private and academic sectors.

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.

Impact-based Forecasts 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.

NMHSs: 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).

MHIEWS: Multi-Hazard Impact-Based Early Warning Systems – impact-based Early Warning Systems capable of providing warnings for multiple hazards.

Objective Forecast: A forecast one made without the personal judgement of the forecaster.

Operating Model: Describes the underlying arrangements of people, processes, systems and information needed to execute the business model.

Private Sector: Part of the economy run by individuals or groups.

Public Sector: Part of the economy run by the state.

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.

Synoptic Meteorological Network: A network of stations at which surface and upper-air observations (at locations that give meteorological data representation of the area in which they are situated, that could range many hundreds of kilometres) are made at standard times (i.e., main synoptic times: 00:00, 06:00, 12:00, and 18:00 UTC (Universal Time Coordinated); and intermediate synoptic hours: 03:00, 09:00, 15:00, and 21:00 UTC) for the purpose of presenting a comprehensive and nearly instantaneous picture of the state of the atmosphere.

Weather, Climate, and Water: A tag used frequently instead of meteorology and hydrology.

Meteorology is inclusive of weather and climate, and these terms are interchangeable. Water refers to hydrology and occasionally to oceanography. The term meteorological embraces both meteorological and climatological phenomena.

World Meteorological Organization: An intergovernmental organization with 191 Member states and territories with the purpose of facilitating worldwide cooperation in the establishment of stations for making meteorological, hydrological, and other geophysical observations; promoting the establishment and maintenance of systems for the rapid exchange of meteorological and related information.

¹ Technologies to be used: mobile and landline telephones, Internet (e-mail, Google, Facebook, Twitter, WhatsApp, smartphone apps, online advertising, Internet of Things (IoT) devices, in-home smart speakers, etc.), sirens (in-building or outdoor), broadcast radio and television, cable television, emergency radio, amateur radio, satellite direct broadcast, and digital signage networks (highway signs, billboards, automobile and rail traffic control), among others. Source: ITU

Executive Summary

Disasters are a yearly challenge for Member States of the Intergovernmental Authority on Development, and like all other African regions, the scale and impact of disasters is increasing, especially those associated with climate and weather-related phenomena. Provision of early warning that facilitates effective early action is one of the most important tools available to reduce the impact of these disasters – saving lives and livelihoods, protecting development gains and the environment. This IGAD Institutional and Operational Framework for Multi-Hazard Early Warning and Early Action sets out the IGAD response to these challenges, establishing robust arrangements for coordination of regional early warning and early action. However, to be effective, in addition to setting out Regional arrangements and structures, the IGAD Institutional and Operational Framework for Multi-Hazard Early Warning and Early Action must also set out how the IGAD approach will be coordinated with early warning arrangements at the continental and Member State levels. In this way, risk data and warning information can be quickly communicated and disseminated between all partners acting at sub-national, national, regional, and continental levels. While each level and partner will have their own part to play, the swift and effective exchange of information and data within a single and harmonised framework will ensure that warnings reach those required to act in the face of danger. The IGAD system will also reduce costs and burdens for Member States by reducing duplicate efforts and ensuring the effective exchange of knowledge and best practices between early warning professionals from each Member State.

In recent years, many individual Member States have made significant advances in Early Warning provision for specific hazards such as flood and drought, supported by continental and regional bodies and international partners. However, in 2015, the Sendai Framework pointed out that increasing disaster events may occur cascading, simultaneously, or cumulatively over time. Hence, Early Warning systems need to take the potential interrelated effects arising from hazard events into account. The Sendai Framework urged a paradigm shift in how risk information is developed, assessed, and utilized in Multi-Hazard Early Warning Systems, disaster risk reduction strategies and Government policies. It stated: *“in order 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 and sharing such information and on how it is created, strengthening disaster risk governance and coordination across relevant institutions and sectors and the 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) to include revisions that acknowledge the Sendai Framework and incorporate the recognized benefits of Multi-Hazard Early Warnings Systems, disaster risk information and enhanced risk assessments. The 2017 MHEWS Checklist identifies four essential components of any Early Warning System that need to be in place and fully harmonised to ensure that effective warning and Early Action can be taken:

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

Disasters do not respect jurisdictional boundaries, and increasingly disaster events are having transboundary impacts. To address these dangerous trends, effective coordination on Early

Warning is required within Member States and between Member States, Regional Economic Communities and at the continental level.

In December 2020, IGAD Heads of State endorsed the proposal to establish the IGAD Disaster Operations Centre (IGAD-DOC). The Centre is located at the IGAD Climate Prediction and Applications Centre (ICPAC), in Nairobi. It features a state-of-the-art situation room set up by the ICPAC's DRR Unit, through a joint partnership with UNDRR, the CIMA Research Foundation, and with combined funding from the Government of Sweden and the Government of Italy. Provisions have been made for the IGAD-DOC (IDOC) to lead on regional monitoring and forecasting of major prevailing hazards. The centre will generate multi-hazard early warning information and will coordinate efforts for early action across all stakeholders equipped with advanced technological capability. It will advance coordination by establishing operational linkages with relevant institutions in the Member States. This IGAD Institutional and Operational Framework for Multi-Hazard Early Warning and Early Action (the IGAD Framework) compliments the Continental Framework and establishes the structures and arrangements necessary to operationalise early warning through the IDOC.

Early Warning Systems, even for a single hazard such as flooding, are complex and require close coordination between multiple partners to ensure that all necessary components are in place. Developing warning systems for multiple hazards that ensure the effective exchange of data and information across jurisdictional boundaries adds further layers of complexity. Therefore, IGADs Framework sets out both a draft long-term model for early warning and early action delivery, and a seven-year program to enhance and further develop existing warning systems. This approach will both support immediate improvements in existing warning system provision and provide a roadmap for IGAD and MS to work toward delivery of their Commitment to establish MHEWS by 2030.

This multi-year engagement programme will be delivered in two distinct phases set out over seven years. The program is designed to allow necessary discussion and stakeholder engagement and the time necessary to establish supporting structures at Member State levels. The program is supported by a more detailed delivery plan, which will be subject to annual review by IGAD Decision Makers so that parts of the plan or programme can be accelerated and delivered more quickly if circumstances permit. Further detail on the proposed programme is set out in Chapter 6 and Annex 2. An overview of the two phases is set out below.

Phase 1: Development Phase and Operationalisation of MHEWS at Regional Level (3 years)

This phase shall commence with establishment of decision-making and technical working groups at regional and Member State (MS) levels to guide MHEWS development. At regional level, the priority will be early operationalisation of the IDOC. This will not only deliver immediate benefits to Member States, but will also provide assistance in coordination of the regional programme and the effective exchange of early warning data and information between Member States.

For Member States, the early priority will be to sensitise decision makers and start work on capacity building for existing sectoral Early Warning Systems, concentrating on the enhancement of natural hazard systems as a first step toward MHEWS delivery.

During the development phase 1, the programme should have a light management structure, as most activities will be related to sensitising decision makers and building partnerships and capacity at Regional and National levels. IDOC will play the role of overall programme management coordinator and will develop annual work plans that will be agreed with national counterparts. At least four regional consultation meetings per year (virtual or in person) will be organized to facilitate exchange of information and views between the regional and

national MHEWS coordinators. This regular exchange of information and ideas will help to avoid overlap between programs, identify opportunities for partnership working, and help to reduce duplication of effort. MHEWS Coordinators will also ensure that the Program delivers the outcomes agreed in the work plan document.

In addition to IDOC operationalisation, this phase includes continued development and capacity building for existing sectoral warning systems, such as natural hazards, and review and development of National MHEWS Facilities / Situation Rooms in light of lessons learned in operationalising the IDOC. These lessons will be shared between all IGAD MSs and the regional programme will be reviewed with any amendments submitted to Decision Makers for endorsement at the conclusion of phase 1 and prior to commencing work on phase 2.

Expected output:

Institutional architecture for the IGAD MHEWS Programme is fully established and the IDOC fully operationalised. 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. Technical Working Groups at MS, REC and continental levels will guide the establishment of the MHEWS Facilities / Situation Rooms at national level and development of SOPs and protocols for data exchange along with any recommendations made for procurement of common technical systems and equipment. The Technical Working Groups shall have considered and analysed suitable long term MHEWS governance arrangements and budgetary arrangements and put forward proposals for consideration of decision makers.

Phase 2: MHEWS Piloting and Delivery at Member State Level (4 years)

This stage may involve further work to enhance legal and institutional arrangements at MS level as recommended by national experts during phase 1, development of SOPs and Operational Plans to support effective early action at MS level, and further expansion of the IDOC role to incorporate a wider range of hazards as required.

Expected output:

Operationalisation of the IGAD Framework at MS level and continued capacity building and support for MS in development of the necessary systems and structures required for delivery at MHEWS at national and sub-national levels. Development of proposals to sustain the MHEWS system into the long term, including identifying any requirements to upscale the MHEWS and identifying sustainable financing for the system into the long-term programme.

Chapter 1

Introduction and Overview

1.1 Introduction

The adverse impacts of natural hazard induced 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 sustainable development. The total number of natural hazard-induced disaster events and their related economic and humanitarian losses have been increasing steadily since the 1980s. The COVID-19 pandemic has provided similar challenges and economic and humanitarian losses, providing further evidence for the need to coordinate hazard and Early Warning information at the continental, regional and Member State level.

Effective early warning that drives effective early action is essential to tackle these increasing challenges, and it is this early action that can reduce exposure to hazards and help prevent many small emergencies from developing into disasters. Examples of effective early action at the national or sub-national level include deploying responders in advance of a flood, providing time for the evacuation of vulnerable people to shelters, or early harvesting to protect livelihoods and food security. At the regional level, early actions could include establishing advanced regional monitoring arrangements or mobilising regional funds or resources.

The Africa Regional Strategy for Disaster Risk Reduction (ARSDRR) adopted by African Union (AU) Heads of State and Government in 2004 sets out a number of key objectives:

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 disaster risk reduction in emergency response management

The strategy 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 climatic factors in some areas, these were not widespread. The strategy gave direction on measures to improve Identification and Assessment of Disaster Risks including:

- Improve the quality of information and data on disaster risks.
- Improve identification, assessment and monitoring of hazards, vulnerabilities and capacities.
- Strengthen Early Warning Systems, institutions, capacities and resource base, including observational and research sub-systems.
- Improve communication and information exchange among stakeholders in risk identification and assessment.
- Engender and improve integration and coordination of risk identification and assessment processes and interventions.

The implementation of the 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) succeeds 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 AU Heads of State and Government have expressed their strong commitment to the implementation of the SFDRR as a means of sustaining the momentum generated by the Extended Program of Action (POA).

IGADs Framework is designed to support delivery of the POA by ensuring 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 aligned with and communicated through its member states. However, it is recognised that delivery of an effective and end-to-end warning system at MS and regional level will not occur overnight; it will take the long-term commitment of IGAD and MS Governments, supported by the continental level and development partners. Given that all IGAD MS are starting from a different position in relation to their current MHEWS provision, the various components of the IGAD Framework will likely need to develop and build capacity incrementally over time. This IGAD framework sets out the vision and objectives for the long-term development of early warning in the region. It is designed to establish an institutional framework, encourage enhanced data exchange and partnership working across sectoral and jurisdictional boundaries, and to achieve better alignment of capacity building initiatives.

1.2 International Guidance Relating to MHEWS

The development of Early Warning Systems that can trigger effective Early Action has been recognised as a priority for saving lives and reducing the impact of disasters for many years. Africa has systems for provision of sectoral early warnings for hazards such as meteorological, hydrological, geotectonic, conflict and health, among others. However, in recent years there has been a growing recognition that disasters can have cascading impacts, so that the impacts of a hazard such as drought can quickly become a disaster impacting other areas for which Early Warning is provided, such as health, peace, and security. It is also recognised that disasters do not respect jurisdictional boundaries, and may result in transboundary impacts at the regional, continental, or global level. International guidance has therefore been developed to recognise the importance of effectively coordinating Early Warning Systems across different sectoral disciplines and across different jurisdictional levels.

Monitoring and warning systems developed for significant meteorological events have been in place for many years and the World Meteorological Organisation (WMO) facilitates 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, from health and food security to conflict warning systems.

The Third International Conference on Early Warning (EWC III) held in Bonn, Germany in 2006 delivered the guidance document “Developing Early Warning Systems: A Checklist” to support implementation of the Early Warning components of the Hyogo Framework for Action. The checklist recognised that early warnings are only as good as the actions they catalyse; early action to deliver an effective response that saves lives and reduces losses. If a warning is given, and no one takes the action that the warning was intended to trigger, then the warning system has failed, even if individual technical components, such as hazard monitoring services, functioned perfectly.

Therefore, the checklist recognised, amongst other things, that four key components must be in place and effectively coordinated for any warning system to operate effectively:

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

Following on from the Hyogo Framework and 2006 Checklist, the Sendai Framework for Disaster Risk Reduction 2015-2030 recognised the importance of Early Warning systems and developed Early Warning requirements still further. 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 those revisions to acknowledge the Sendai Framework and to incorporate and strengthen the acknowledged benefits of a multi-hazard approach to development of early warnings systems, disaster risk information and enhanced risk assessments. This revised checklist maintained the previously identified four main components required for any warning system and provided 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:

- The selection of multiple major hazards that the country faces
- The specific contexts where hazardous events may occur simultaneously, cascading or cumulatively over time, and taking into account the potential interrelated effects. Hazards typically included in a Multi-Hazard Early Warning System include (as mentioned in the Sendai Framework for Disaster Risk Reduction 2015–2030, and listed in alphabetical order) biological, environmental, geological, hydrometeorological and technological processes and phenomena.

The 2017 MHEWS Checklist provides a reference point for AU, RECs, national Governments, relevant Ministries, Departments and Agencies (MDAs), community organizations, and other national and international partners to refer to when developing or evaluating Early Warning Systems. The checklists are 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 set out in Fig 1 below, and the four components of efficient, people-centred Early Warning Systems at Fig 2.

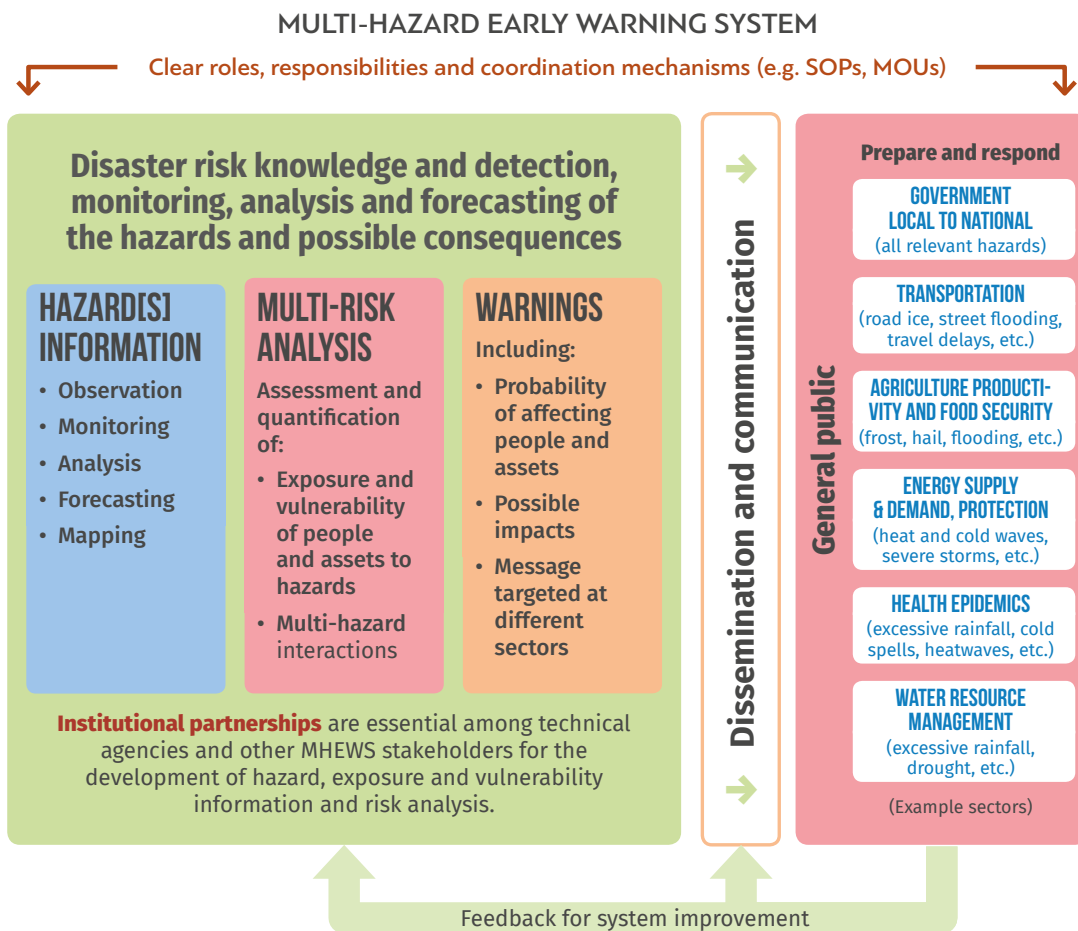


Figure 1: Schematic of a Multi-Hazard Early Warning System. Source: Multi-Hazard EWS Checklist 2017

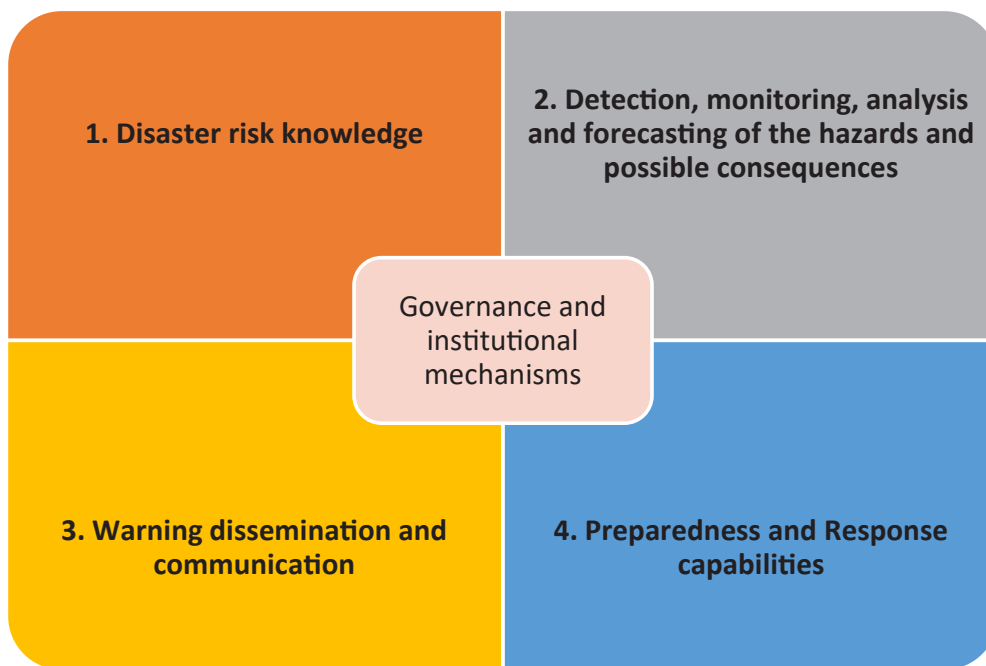


Figure 2: Four Essential Components of an MHEWS Source and required governance arrangements: Multi-Hazard EWS Checklist 2017.

At the Member State level, early warning systems must consider the rich traditional knowledge held by community members. Through extensive experience in being impacted by hazard events and a history of living in the area, many local communities have developed various ways through which they can forecast impending hazards, by using locally available signs and indicators. These signs and indicators serve as triggers for the local communities to take early actions that minimise the impacts.

In developing a comprehensive early warning and early action system at the sub national and community level, 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 component 1), disaster risk knowledge and component 2), hazard monitoring. However, engagement of communities in the design of their warning system will ensure that community members are sensitised to the warning system and have confidence in it, improving component 3), warning dissemination and communication, and component 4), preparedness and response.

1.3. Africa's Continental Guidance on MHEWS

The African Union has produced Africa's Institutional and Operational Framework for Multi-Hazard Early Warning and Early Action, recognising that that multi-dimensional risks require multi-dimensional approaches, and setting out a seven-year program of action to strengthen early warning across the Continent. This IGAD Regional MHEWS Framework supports delivery of the continental document, establishing the structures and ways of working required to deliver its ambitious objectives but in a way that is contextualised to IGADS specific needs and circumstances.

Delivery of the continental MHEWS is complex and requires multiple activities to be coordinated over an extended period at continental, regional and Member State level. Specific outputs and objectives set out in the continental MHEWS Institutional and Operational Framework include:

- Establishment of a Continental MHEWS Program.
- Establishment of common protocols and platforms for sharing data and risk information across sectoral and jurisdictional boundaries resulting in enhanced risk knowledge.
- Capacity building and training to deliver enhanced 24/7 hazard monitoring, forecasting and warning services, supported by a Continental African Multi-Hazard Early Warning System Situation Room and resulting in enhanced monitoring and warning capabilities at MS, REC and continental levels.
- Development and delivery of “end-to-end” warning dissemination and communication protocols and platforms, including the important “last mile” connectivity to ensure all those required to act receive warnings. This will lead to improved warning communication and dissemination both at and between MS, RECs and continental levels.
- Development of protocols and materials to support effective planning, training, and exercising to ensure those required to act in response to a warning can take effective Early Actions. This will deliver more effective emergency preparedness, Early Action, and response capabilities.

Chapter 2

Requirements for an Efficient IGAD MHEWS

2.1 General Provisions for MHEWS Legal and Institutional Arrangements

Legislative structures, supporting policy or framework documents, and detailed institutional arrangements, and guiding tools are the foundations upon which the previously outlined four components of Early Warning are built, strengthened, and maintained.

At Regional level, The IGAD Heads of State endorsed the proposal to establish the IGAD Disaster Operations Centre (IDOC) in December 2020. The primary goal of the IDOC is to support people-centred multi-hazard early warning information and to assist in strengthening early action in the IGAD region.

The IDOC has been given the following functional responsibilities:

1. Monitor major hazards and issue early warning information for the region
2. Coordinate with national focal institutions on early action
3. Rapid mapping of affected areas and impacts of disasters
4. Strengthen capacity to anticipate risk and take early action

Whilst the IDOC has been given responsibility for leadership and direction of the Regional Warning System, and for coordinating with the various sectoral, continental, and MS partners and stakeholders involved in its delivery, this coordinating function does not change the role of any other Regional agencies or bodies.

This Institutional and Operational Framework sets out further detail on how the IDOC will operate in practice, how it will link with national and continental counterparts, and how it will develop capability and capacity over time to allow it to fulfil its mandated functions, commencing with a Regional MHEWS.

At the national level, each MS is responsible for ensuring that they have appropriate legal and institutional arrangements in place to ensure the effective coordination of MHEWS at their respective level, and for communication and coordination with IDOC. The guidance set out in this IGAD Framework is designed to assist them in establishing the foundations necessary for development of MHEWS over time. Those legal and institutional arrangements at MS level must identify each organization responsible for the separate components of a MHEWS and set out how they can integrate and coordinate their work effectively to deliver an end-to-end warning service.

In most MSs, sectoral legislation and policy arrangements cover the contributions to MHEWS made by individual Ministries, Departments and Agencies (MDAs), such as those responsible for DRM, hydrology, meteorology, and health surveillance. However, the assessment underpinning this Framework identified that in many countries there is different sectoral legislation for individual Early Warning System components, enacted at different times, for different purposes, and using different and even contradictory language and definitions. It is also common to find that whilst multiple MDAs are given responsibility for specific MHEWS components, none has been given responsibility to bring together all the various components in order to deliver a single and effective end-to-end warning system capable of initiating early action.

To address this issue, it is proposed that MSs review their legal and institutional arrangements to rationalised references to MHEWS components in sectoral legislation, ensuring that all adopt common definitions and language relating to Early Warning System components. In

addition, it is proposed that a single entity or MDA within each MS is given responsibility for overall coordination of MHEWS. Generally, for MSs this coordination role will be given to the national DRM agency to ensure that data and information relating to multiple hazards can be effectively shared and aggregated, warnings can be disseminated and communicated through the national warning system, and that effective early action and response plans are in place and have been practised.

Where a single MDA is nominated to coordinate MHEWS delivery at MS level, that lead agency does not take responsibility for the technical provision of all associated components. These remain the responsibility of the appropriate sectoral agency such as the national meteorological, hydrological or health agency. The role of the lead MDA for early warning is to provide overall coordination and direction for MHEWS, ensuring the various MDAs responsible for individual MHEWS components are working together to ensure the delivery of a functional end-to-end warning system that facilitates Early Action.

MHEWS Legislation and policy documents at Regional and Member State level must be supported by operational plans and SOPs that provide more detail about the way in which duties should be undertaken. It is important that these supporting documents encourage multi-sectoral engagement and interaction and ensure people from different disciplines and backgrounds come together to coordinate their work on the various components of a MHEWS.

Legislation, policy, and supporting documents should also be structured to facilitate and require local decision-making and participation in warning system design and operation.

An operational model for IGAD and proposals for consideration by MSs is set out in Chapter 4. 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, including recognition of an ambition to work toward a multi-hazard approach to early warning, and the consideration of gender, age, disability and cultural diversity in warning system design.

One of the first steps in MHEWS development identified in both the 2006 and 2017 MHEWS checklists is to identify all the potential Stakeholders involved. The checklists suggest that the principal Stakeholders should include, as a minimum, 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. (e.g., National Meteorological and Hydrological Services (NMHSs), health authorities, geological services, ocean observing organizations, conflict warning services, etc).

2.2 Guiding Principles for the IGAD Regional MHEWS

The vision and model for the long-term development of an IGAD Regional MHEWS is set out in Chapter 4. Additional observations and considerations that have informed the starting point for design of the IGAD operational model include:

- The role of existing Member State and sectoral hazard monitoring agencies is largely unchanged by the IGAD Operational Model. However, there may be opportunities to enhance data sharing as well as opportunities for sectoral agencies to work together more closely on development of generic components of the warning system, such as risk and vulnerability data and mapping, warning dissemination and communication channels and early action planning.
- Given the significance of natural hazards to the IGAD Region, the starting point for

development of the IGAD regional warning system is to establish the regional structures and protocols required for effective natural hazard early warning. Once that system is established, additional hazard warning types may be integrated into the regional system so that common facilities and structures can be used to support warnings for all hazards.

- Member States are at different stages in development of their own national and sub-national early warning systems, and many have significant capacity building needs. Regional entities face similar challenges. Hence, in addition to establishing new regional arrangements, the IGAD MHEWS Program should seek to coordinate and support capacity building for current warning systems.
- Given the scale of existing gaps and challenges in warning provision, and the complexities of integrating the work of multiple entities and partners, a regional multi-hazard warning system fully connected to systems at MS level cannot be implemented overnight. The Regional system will need to be developed and implemented over time, allowing the various sectoral and national partners to build capacity and integrate their work into the regional system.
- The IGAD MHEWS Development Programme supports that proposed by AUC at the continental level but has been adapted to reflect the context and advances already made in the IGAD Region. For example, whilst both continental and regional frameworks adopt a seven-year MHEWS programme, the IGAD programme is planned in two phases, rather than the three stages proposed in the continental plan. This reflects the fact that IGAD has already agreed and developed regional structures and created the IGAD-DOC.
- However, whilst the IGAD region supports the continental MHEWS programme so far as is practical, all efforts will be made to accelerate the program at regional and national level and to implement components more quickly wherever possible.
- In addition to these Regional considerations, the IGAD-DOC operational model has adopted a number of guiding principles:

Guiding principle 1: INTEGRATION AND COMPREHENSIVENESS

For a (Multi-Hazard) Early Warning System to operate effectively, local governments, national governments and IGAD should create an integrated and comprehensive framework that clarifies the roles, responsibilities and relationships of all stakeholders within the system, paying particular attention to addressing the needs of the most vulnerable groups.

Guiding principle 2: RISK INFORMATION

For a (Multi-Hazard) Early Warning System to operate effectively, comprehensive information is required on all the dimensions of disaster risk, including hazards, exposure, vulnerability and capacity, related to persons, communities, organizations and countries and their assets.

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: TIMELINESS

Warning communication and dissemination systems (including the development of last-mile connectivity) must ensure decision makers and communities required to act receive warnings in advance of impending hazard events. Timely exchange of data and information both at and between the sub-national, national and regionals level is also essential in facilitating effective Early Action.

Guiding principle 5: AWARENESS

Institutions and people must be prepared and enabled to act early and respond to a warning through effective contingency planning and enhanced risk education.

Guiding Principle 6: COOPERATION

Provision of effective Early Warning depends on effective cooperation and coordination across sectoral disciplines and between sub-national, national, regional, continental and international bodies.

Guiding principle 7: SUSTAINABILITY

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

Guiding principle 8: SHARED RESPONSIBILITY

Regional, sub-national and national Organizations and electoral departments and all stakeholders are involved in the Early Warning and Early Action System, each with its own mandate and mission.

Guiding principle 9: GOVERNMENT ACCOUNTABILITY

Disaster prevention, risk reduction and early warning are the primary responsibility of national governments IGAD supports those initiatives and can ensure the effective exchange of warnings, data, and information between them.

Chapter 3

IGAD MHEWS Roles and Responsibilities

3.1 Overview of Current Roles and Responsibilities

An end-to-end Early Warning System depends on the effective coordination of several components as set out in Chapter 1. Those components are delivered by separate sectoral bodies at regional and Member State level. The principle of subsidiarity means that Member States have primary responsibility for development and maintenance of warning system components, with support and coordination provided by IGAD. Similarly, IGAD and other Regional Economic Communities are supported in their work at the African Union level, for example in coordination of programmes, providing training and sharing good practices.

Warning systems for some hazards are already coordinated at the 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 IGAD level.

3.1.1 Overview of Current Roles and Responsibilities

Various departments at the continental level are already tasked with duties that can either benefit from, or contribute toward, delivery of MHEWS at IGAD and MS levels. A brief description of the key Continental departments and their role is set out below.

The **Department for 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 Program of Action (PoA) in line with the Sendai Framework. This mandate clearly includes achievements in the target G of the Sendai Framework: “Substantially increase the availability of and access to Multi-Hazard Early Warning Systems and disaster risk information and assessments to the people by 2030.” DARBE is also mandated to enhance capacities of Member States and RECs to access near real-time environmental monitoring, which is important for natural resources, and climate information for policy, 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 AMHEWS Situation Room DARBE is developing will play a critical role in MHEWS delivery.

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 AU 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 strong 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. HHS's role in case of disasters is 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 & Innovation (ESTI)** coordinates the AU Programs 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.

3.1.2 Role of Existing Regional Hazard Monitoring Departments and Agencies

Various departments at IGAD level are already tasked with duties that can either benefit from, or contribute toward, delivery of MHEWS at IGAD and MS levels. A brief description of the key Regional departments and their role is set out below.

IGAD Climate Prediction and Applications Center (ICPAC)

ICPAC is a Regional Climate Centre accredited to the World Meteorological Organization. It provides climate service to 11 countries for the Greater Horn of Africa including IGAD Member States. It provides services that address agriculture and food security, climate and weather forecasting, disaster risk management, water resources and capacity development. ICPAC works to reduce the loss of lives and livelihoods by providing timely early warnings and preparedness for disasters. They aim to create capacity to mitigate impacts and manage risks, and ensure that when people are affected by disasters they can continue to meet their minimum needs for food, water, shelter, health and security.

Key ICPAC Services include:

1. **Capacity Building:** For issues such as disasters preparedness, hazard assessment, Post Disaster Needs Assessment
2. **Monitoring and Early Warnings:** for risks such as drought or floods
3. **Investments for resilience:** such as disaster risk reduction
4. **Coordination:** supporting coordination of stakeholders working in disaster risk management
5. **Risk analysis:** including conduct of risk assessments and mapping of disasters in the region
6. **Support to recovery:** supporting recovery efforts at national level

In support of these aims, the IGAD Disaster Operations Centre (IDOC) was launched in 2021 and serves as the multi-hazard situation room to advance the development of important applications that will ensure close links between early warning-early action and anticipatory actions in the areas of floods, cyclones, heat waves, drought, food security and locust invasion.

CEWARN – IGAD’s Conflict Early Warning and Response Mechanism

CEWARN - IGAD’s Conflict Early Warning and Response Mechanism - was established in 2002 on the basis of a protocol signed by IGAD Member States.

In establishing CEWARN, IGAD Member States made a major strategic decision to utilize early warning and early response to prevent violent conflict, so as to serve their people’s aspirations of shared prosperity and a sustained just peace. CEWARN’s mandate is to receive and share information concerning potentially violent conflicts as well as their outbreak and escalation in the IGAD region; undertake and share analyses of that information; develop case scenarios and formulate options for response; share and communicate information analyses and response options; and carry out studies on specific types and areas of conflict in the IGAD region.

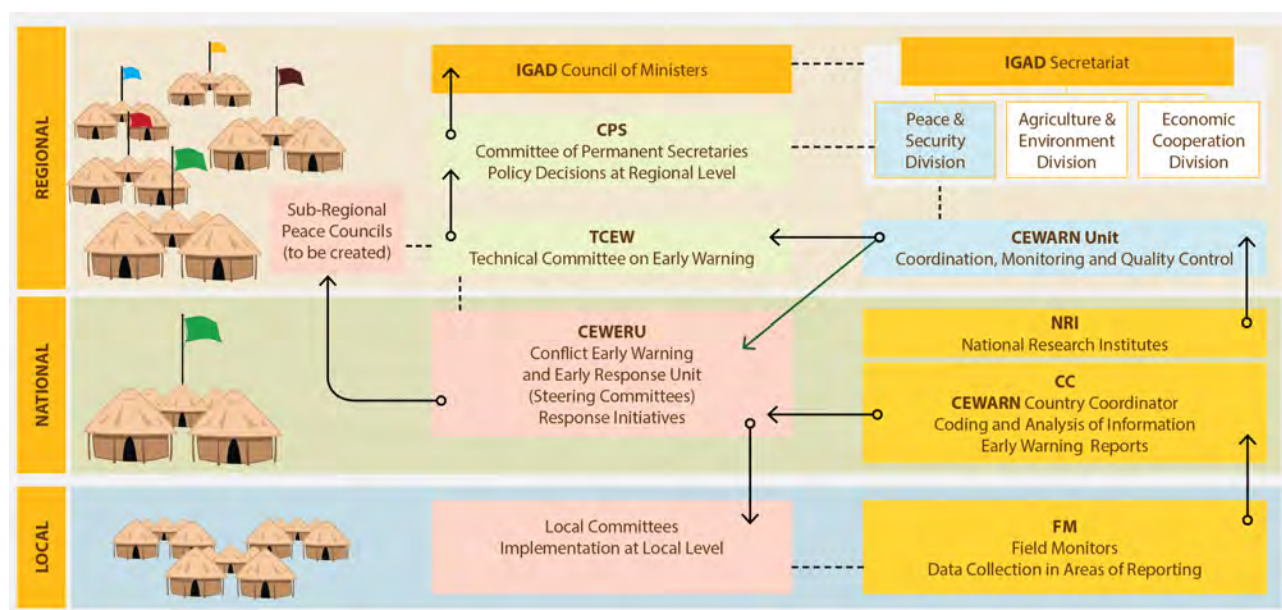


Figure 3: Overview of the CEWARN System

3.1.3 Role of Existing National Hazard Monitoring Departments and Agencies

There are many existing warning system departments and agencies operating at Member State level. Some of these bodies are responsible for providing an end-to-end sectoral warning system, such as the warning systems for drought or food security. Other bodies may only have responsibilities for individual warning system components, such as hazard monitoring and forecasting where, for example, National Metrological or Hydrological Services provide hazard monitoring and warning services.

The following generic list sets out the common agencies and bodies involved in the delivery of each individual early warning component at Member State level. It is intended to be illustrative only; each MS will have different bodies and structures to reflect their own legal and institutional arrangements.

Typical National and Sub-National Level Agencies and Bodies involved in EWS

1. Disaster Risk Knowledge	1. National DRM and Local Responder Agencies
	2. Land Use and Development Planning
	3. Agriculture and Food Security
	4. Hydrology and Water Resource
	5. Geology and Lands
2. Detection, Monitoring, Analysis and Forecasting of the Hazards and Possible Consequences	1. Metrological
	2. Hydrological
	3. Health
	4. Conflict
	5. International Organisations
	6. NGOs
3. Warning Dissemination and Communication	1. National and Sub-National DRM / Metrological / hydrological Agencies
	2. Local Government
	3. Traditional and new Media Organisations
	4. Community and Traditional Leaders
4. Preparedness and response capabilities	1. National DRM and Local Responder Agencies
	2. Communities and volunteer responders
	3. Local Governments
	4. International Agencies and NGOs
5. Governance and Institutional Arrangements	1. National Authorities responsible for Legislation covering DRM and Hazard Monitoring Agencies
	2. National Treasury
	3. Local Governments

3.2 Proposed Roles Under the IGAD Framework

Taking a multi-hazard approach to an Early Warning System design and operation as set out in 3.1 above does not change the role or responsibilities of any existing specialist agencies and departments at IGAD or national level. Instead, the IGAD-DOC Operational Model for MHEWS provides a single overarching framework for coordination, cooperation and information exchange between those existing bodies and agencies responsible for sectoral warning systems, or warning system components. The objective is to support them in improving warning services and the Early Actions that they are intended to trigger.

Whilst the starting point for development of the IGAD MHEWS is natural hazards, it has been designed to offer flexibility to incorporate and support the contributions of all hazard monitoring agencies over the proposed seven-year development programme to ensure that a truly multi-hazard approach can be adopted over time. For example, space agencies are providing increasingly valuable information on hazard monitoring and mapping, and while this information may not be universally available today, the IGAD system allows it to be incorporated where appropriate in the future. These new types of hazard monitoring tools and

the monitoring bodies that use them may feed into existing warning systems. For example, to monitor weather conditions and crop impacts. However, in the future they may also provide new types of warning, such as warning of solar storms with the potential to impact power and telecommunications networks. Once these types of warning systems become operational, the IGAD MHEWS can incorporate them into the overall Regional Warning system.

Whilst the role and responsibilities of existing Early Warning Bodies may be unchanged by the IGAD MHEWS, 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 working initiatives that will enhance performance and / or reduce the cost for delivery of Early Warning Systems. Formalised collaboration between warning system bodies offers numerous opportunities and advantages. Although they are only intended to be indicative of potential partnership opportunities, some examples are set out in the box below:

Examples of Multi-Sectoral partnership working opportunities

Work 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 sectoral 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 and for purposes beyond early warning such as development of spatial development plans. Commissioning joint vulnerability assessments that will inform multiple warning systems and other policies, and ensuring that any assessments commissioned meet minimum standards and are made available to all Stakeholders for their use, will both improve the accuracy of system design and reduce costs.

Requirements for warning dissemination and communication are common across many sectoral warning systems. Development of common communication protocols, systems and technologies could reduce system costs, enhance system reliability, and add value to multiple warning systems. This is especially important in delivering “last mile connectivity”, ensuring the most vulnerable receive warnings in a reliable and timely manner. Developing a single warning dissemination protocol for all sectoral warnings will ensure clear and actionable warnings are delivered reliably, and costs for dissemination equipment (where required) may be shared across multiple warning system operators.

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

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 components of the warning system that will delivery most benefit.

3.3 Responsibilities for Delivery of the IGAD MHEWS Development Program

The IGAD Heads of State have tasked the IGAD Disaster Risk Management programme with the establishment and operation of the regional MHEWS. The IDOC will provide the necessary leadership and technical support to develop the regional MHEWS, and in doing so, provide leadership and support for Member States who will remain responsible for developing MHEWS at national and sub-national levels.


Given the multitude of stakeholders involved at MS and IGAD levels, and the fact that all MSs are at a different stage in development of their own MHEWS, the MHEWS Development Programme set out in Chapter 4 establishes a flexible seven-year programme for MHEWS development broken down into two phases. During this programme for MHEWS development, the focus will be operationalising the IDOC and supporting and enhancing the capacity of existing sectoral warning systems at member state level through enhanced coordination and information exchange mechanisms.

Hence, the IGAD MHEWS Development Programme will be led and coordinated by IDOC and supported by national MHEWS Coordinators and Early Warning Technical Working Groups (EW-TWGs) that will be responsible for the oversight and delivery of the MHEWS Development Programme at national levels.

Chapter 4

IGAD MHEWS Regional

Operational Framework



4. IGAD MHEWS Regional Operational Framework

The aim of the IGAD MHEWS Regional Operational Framework is to facilitate saving lives, protecting livelihoods and protecting 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. This will enable them to reduce their exposure to hazards as far as possible by taking effective Early Action, helping to prevent many small emergencies from developing into disasters.

However, warning systems are only as good as the early actions they catalyse, and if a warning is given but is not received by those required to act, or no one takes the action that the warning was intended to trigger, then the warning system has failed. Hence, the IGAD Regional Operational Framework establishes practical structures and mechanisms for coordination of all early warning components and all of the delivery partners at sub-national, national, and regional levels that are responsible for them.

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. IGAD and its Member States have committed to work toward a multi-hazard approach to Early Warning and risk assessment, adding complexity to system design. Delivery of an MHEWS at IGAD level presents the additional challenge of transboundary risks impacting both within the region and beyond.

The development of an effective IGAD MHEWS Operational Framework to mitigate the impacts of natural and human-induced disasters relies on the establishment of proactive, interagency coordination, with relevant Stakeholders at local, national and regional levels. This requires the development of formalised structures to coordinate Early Warning System development across all IGAD MSs. Ultimately, the Operational Framework must ensure that Early Warning information and advisories can be issued to all Stakeholders who have a direct interest in receiving such information, enabling them to make timely decisions and take effective Early Actions.

In recognition of the complexities involved, and the requirement for extensive stakeholder engagement at MS and Regional levels, the proposed Operational Framework for MHEWS delivery set out below incorporates two key principles:

1. First, the draft model does not propose replacing existing sectoral, national, or regional 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, the draft model proposes enhanced regional 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.

4.1 Enabling Environment for Operation of an effective IGAD MHEWS.

An MHEWS 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 operationalize MHEWS for the long term, this section sets out some of the key issues to be considered when developing those long-term plans and structures.

4.1.1 Strong Political and Financial Commitment.

A strong political recognition of the benefits of an IGAD-wide standardised MHEWS is required to ensure the success of such a system. This must be supported over time by enhanced harmonisation between Sub-National, National, and Regional disaster risk management policies, planning and legislation.

MHEWS cannot be delivered without strong political leadership and the provision of adequate and sustainable budgets. Investment in anticipatory actions to reduce disaster risk, including in Early Warning Systems, can deliver strong returns on investment. However, in many instances disaster financing has been focussed only on response and recovery, with limited funds available for investment in anticipatory actions such as early warning. This leads to a cycle of significant disaster losses followed by significant response and recovery costs. Tackling this dangerous cycle and encouraging investment in anticipatory actions such as Early Warning will require strong political leadership and commitment at both regional and MS levels.

4.1.2 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. This should be built upon the four MHEWS components, namely:

1. **Disaster Risk Knowledge.**
2. **Detection, Monitoring, Analysis and Forecasting.**
3. **Warning Dissemination and Communication.**
4. **Preparedness and Response Capability.**

As a practical example of the need for institutional cohesion among all Early Warning components, when considering the challenges in development of an Early Warning System for flooding at the level of a single MS:

- DRM and hydrological services will need to work with Local Government and communities to better understand flood risk and vulnerability. This is essential for the establishment of warning thresholds and developing impact-based warnings that form part of the **Disaster Risk Knowledge** component of an EWS.
- Hydrological services may understand and monitor water levels for flood risk, but will need to coordinate with meteorological services and others, such as hydroelectricity dam operators, to receive advance warning of heavy rains or planned water releases that may lead to flooding. This is essential in delivery of the **Detection, Monitoring, Analysis and Forecasting** component of an EWS.
- 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, paying particular attention to “last mile” connectivity to ensure warnings reach especially vulnerable communities. This is essential in delivery of the **Warning Dissemination and Communication** component of an EWS.
- Warnings are of limited value if they are not acted upon. 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 provide flood maps indicating areas most at risk of flooding, and identify areas safe from flooding that may be nominated for the establishment of emergency shelters. **This is an essential component in the preparedness and response component of an EWS.**

As illustrated in this example, even for a single hazard warning system such as flooding, operating within a single MS, there are multiple sectoral stakeholders that need to be engaged and coordinated 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 working in complete isolation.

4.1.3 Clearly defined Roles and Responsibilities of all Stakeholders.

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

4.1.4 Resource Allocation.

MHEWS 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 (human, financial, equipment, 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 investment patterns make the continuous operation, maintenance and development of the Early Warning infrastructure a challenging task and may lead to sub-optimal investment decisions.

Financing anticipatory actions to increase resilience delivers a range of benefits that ensure a very positive return on investment, both should a disaster strike and even if it does not. Many of these benefits were captured in a working paper entitled “The ‘triple dividend’ of Early Warning Systems, evidence from Tanzania’s coastal areas,” produced by Maria Apergi, Emily Wilkinson and Margherita Calderone (Maria Apergi, 2020). MHEWS Coordinators and EW-TWGs must make a strong business case for MHEWS investment, supported by relevant facts and costs, and reinforce 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 cases for MHEWS investments. Examples of benefits set out in the working paper are set out below at Figure 4.

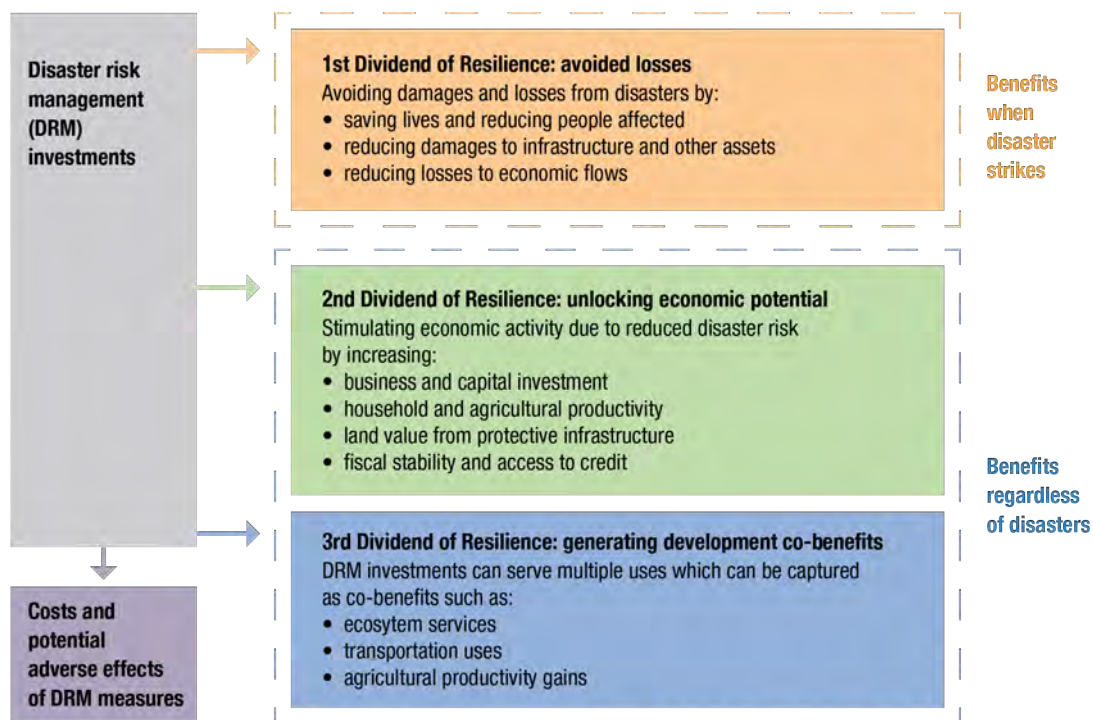


Figure 4: Examples of benefits delivered through investment in resilience
(Apergi, Wilkinson & Calderone 2020)

Delivery of MHEWS at the IGAD and MS levels will require investment in multiple sectoral organizations and will require careful prioritisation. Some examples of general areas that might be considered for investment to deliver the IGAD MHEWS Framework are set out below. These are indicative only 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 strengthen MHEWS 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-Sectoral MHEWS Development and Investment Plan identifying regional entities and MS 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. Whilst each regional entity and MS MDA may have their own sectoral development plan, capturing this information in an overarching IGAD MHEWS plan will enable prioritisation to be undertaken 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 to ensure warnings reach all those required to act, including decision makers, seasonal populations, and those in remote locations, through multiple communication channels. Develop appropriate protocols and

SOPs to support warning communication and dissemination and the adoption of the Common Alerting Protocol. 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 MHEWS components and undertake training and drills for those required to act, including decision makers and communities.

4.1.5 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. IGAD coordination of Multi-Agency and Multi-Sectoral collaboration on this risk mapping exercise will not only improve the accuracy and utility of the results but will reduce the cost and burden for governments and development partners. The sharing and integration of risk data and information between all MHEWS partners is essential in ensuring that appropriate impact-based warnings can be instigated, and that effective Early Action plans can be developed.

4.1.6 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 required to act. Warning messages should provide clear guidance to trigger reactions (e.g., evacuation) and consider the different risks and needs of subpopulations, 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.

4.1.7 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, and warning dissemination mechanisms must be designed to ensure warnings reach all of 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 flooding or earthquake), 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.)

4.1.8 Integration of MHEWS 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 MHEWS design can also be utilized to develop and design Early Action plans, such as evacuation strategies. (evacuation routes, demarcation

of safe areas and location of temporary shelters, use of vertical evacuation if needed).

4.1.9 Early warnings mainstreamed in relevant public awareness and educational programmes.

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

4.1.10 Feedback.

Effective feedback and After-Action Review mechanisms should be developed at all levels to provide systematic evaluation of MHEWS performance to ensure the system is operating as planned and to identify any lessons learned to inform continuous improvement.

4.2 Overview of the IGAD MHEWS Model

The IGAD MHEWS Model is designed to align with the structures set out in Africa’s Institutional and Operational Framework for Multi-Hazard Early Warning and Early Action, contextualised for the IGAD Region, and recognising the existing structures and facilities that IGAD already has in place.

The IGAD MHEWS Model establishes early warning coordination functions at regional and Member State levels. Each of these functions has a specific task and set of responsibilities. However, importantly, each of these functions also provides a link and connection between the levels to ensure that data, information, and warnings can be effectively communicated across jurisdictional boundaries. A high-level summary of these functions, their primary responsibilities, and related stakeholders, is set out in figure 5 below.

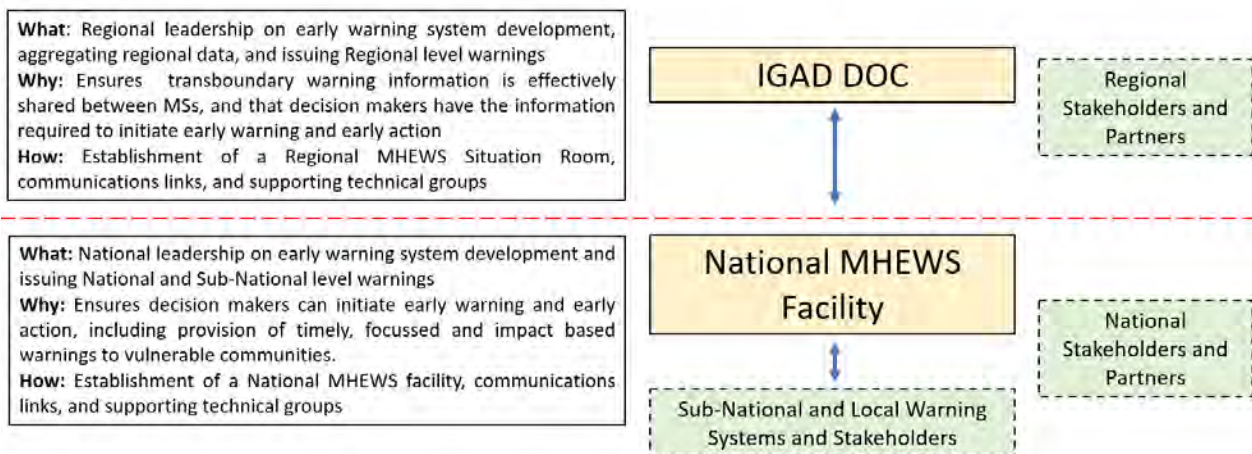


Figure 5: High Level summary of Regional MHEWS Functional Responsibilities

4.3 MHEWS Warning Tiers at IGAD, National and Sub-National Levels

Warnings are issued at multiple levels and aimed at diverse population groups and end users. The IGAD Framework uses only three warning tiers-regional, national and sub-national-based on the potential impact or consequences of the event for which warning is being issued and its potential geographical impact or spread. Where there is a threat of events within IGAD having transboundary impacts on neighbouring regions, the IDOC will notify the continental level where a fourth tier of warning is operated. Conversely, the continental level will alert IDOC should events in other regions threaten to have transboundary impacts for any IGAD MS, so that the warning can be issued to them under the IGAD system.

The IGAD Framework 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 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, the relevant hazard monitoring agencies within an MS will need to monitor hazards and issue warnings through the national MHEWS facility to multiple sub-national areas.

Disasters do not respect jurisdictional boundaries, and some hazard events may have the potential for transboundary impacts. In these instances, warnings and warning information needs to be coordinated between MSs at the IGAD 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 between IGAD and the continental level to ensure effective communication of warnings and warning information between RECs. The three functional levels of warning applicable to IGAD are set out as per Figure 6 below.

At MS level, the local tier of warning may be delivered through the individual technical systems designed to monitor specific hazards. In most countries of the IGAD Region, the national meteorological and hydrological agencies will be the primary hazard monitoring services, responsible for a range of natural hazards including flooding, landslide, windstorm and drought. Hazards may also be monitored at sub-national level with the addition of more localised or community-based warning systems to meet the specific context and circumstances of the country.

For the purpose of the IGAD MHEWS Operational Model, national warning services are simply divided into those provided at national or sub-national levels. It is a matter for MSs to determine the precise operational arrangements for sub-national warnings, and they may further subdivide their own internal warning systems as they wish to suit their particular needs and context.

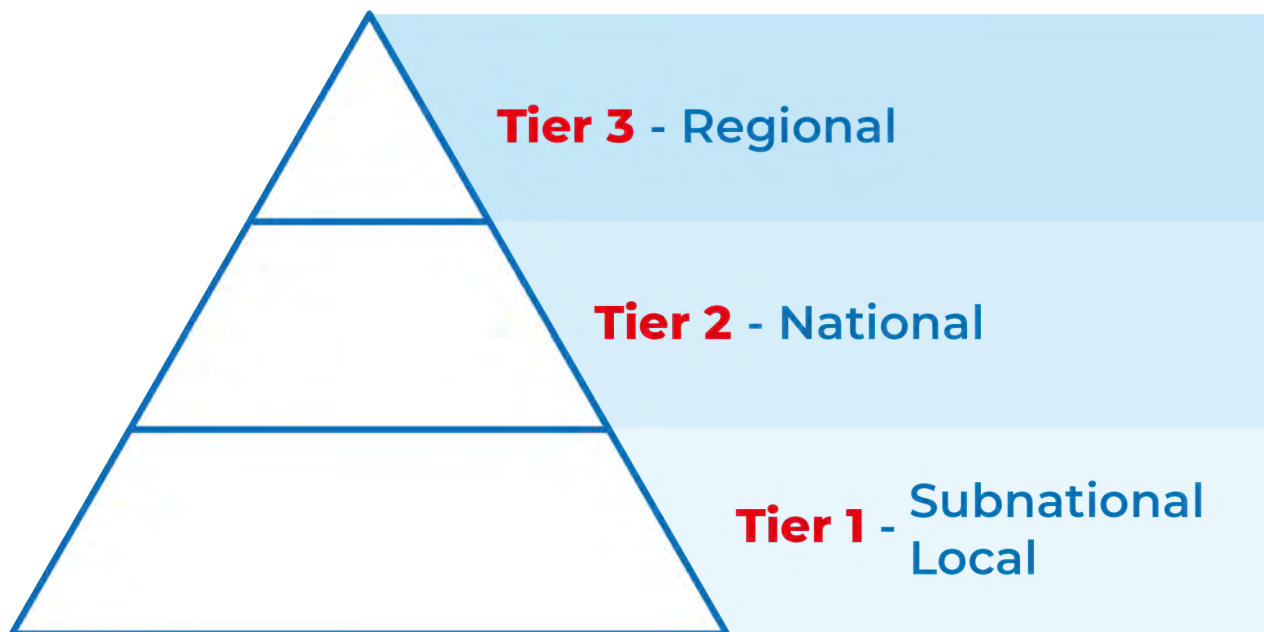


Figure 6: Schematic Diagram of the 3 Tiers of the IGAD MHEWS

Level 1 –Sub-National Early Warnings: issued for routine events triggered by the national or local MHEWS facility on the advice of the relevant Hazard Monitoring Services, or local or community-based Early Warnings triggered by local monitoring equipment or the local knowledge of communities. Warnings are targeted at specific 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.

Level 2 – National Early Warnings: triggered at the MHEWS 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 MHEWS facility will ensure all hazard and warning information, including situation reports, is shared and disseminated to impacted jurisdictions and local governments.

Level 3 – Regional Transboundary Early Warnings: issued when IDOC identifies the potential for significant transboundary impacts, or anticipated impacts, from a single hazard event being monitored that has the potential for very significant consequences. Regional Warnings may be issued to all impacted, or potentially impacted, Member States. Once a Regional Warning is issued, the IDOC will ensure all hazard and warning information, along with situation reports, is shared and disseminated to impacted MSs. They will also share data and information with the continental level, where a decision can be made on whether a level 4 warning is required so that adjoining RECs can be informed.

Warning Activation Levels and Criteria

The general criteria applicable for triggering each of the three Regional MHEWS Warning tiers is set out at table 1 below. EW-TWG's may develop further and more detailed criterion and actions applicable during the 7-year MHEWS Program.

Level	Criteria for Activation	MS Level Action	IGAD Level Action
Level 1	<p>Localized Sub-National Warning triggered by National EWS Service or community based EWS targeting specific geographical areas within a MS.</p> <p>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 within the MS.</p>	<p>National MHEWS facility monitors the situation and provides information and warnings to sub-national level as required.</p> <p>National agencies, such as DRM, monitor the situation and take any actions set out in their plans.</p>	<p>No formal action required.</p> <p>However, partial activation of IDOC in monitoring role may be considered if the level of risk is believed to be escalating.</p>
Level 2	<p>National warning triggered by National MHEWS facility for significant events that impact, or have the potential to impact, multiple administrative areas within MS. Level 2 warnings may also be issued for more localized events with potential of very significant consequences which require national hazard monitoring and forecasting to support a National response effort.</p>	<p>National MHEWS facility issues warnings to impacted sub-national areas and monitors the situation to provide information to sub-national or national emergency operation centres as required.</p> <p>National agencies, such as Metrological, Hydrological and DRM, monitor the situation and take any actions set out in their plans to issue further warnings or direct and support local response.</p>	<p>Partial activation of IDOC to monitor the situation at MS level.</p> <p>Provision of data, mapping, advice, guidance, and technical support for National Counterparts on request.</p> <p>Activate any early action plans in respect of the specific circumstances.</p>
Level 3	<p>Regional Warning triggered when the IDOC identifies the potential for events likely to have transboundary impacts/ anticipated impacts from a single hazard event that has or may affect more than 1 MS.</p> <p>Request from a MS for additional regional support in hazard monitoring and warning.</p>	<p>Actions for MS at level 3 are the same as level 2, with the exception that they will need to formalise arrangements to receive information from, and provide information to, the IDOC.</p>	<p>Full activation of the IDOC.</p> <p>Establish communications with the affected Member States, issuing a regional warning of potential transboundary impacts to those not already on alert.</p> <p>Provision of data, mapping, advice, guidance, and technical support for National Counterparts on request.</p> <p>Activate any early action plans in respect of the specific circumstances.</p> <p>Inform the Continental Situation that a Regional Warning is in operation so that they can evaluate the situation and escalate to Level 4 Warning for neighbouring RECs as required.</p> <p>Issue Situation Reports to Regional and MS decision makers.</p>

Table 1: IGAD MHEWS Warning Activation Criterion

4.4 IGAD / IDOC Regional Roles and Responsibilities

The IDOC has been established to deliver MHEWS on behalf of IGAD. In relation to the issuing of warnings, the primary role of the IDOC is to ensure MHEWS data and information is shared between MSs, especially in relation to any hazards that may present a risk of transboundary spread. IDOC can also support national counterparts through the provision of data and information to inform their own early warnings decisions, and can trigger a regional warning for hazards impacting, or threatening to impact, more than one MS within the region.

The IDOC, in partnership with regional and national entities, will identify potential early actions that may be taken for various contingencies and trigger those actions should a warning threshold be breached. Those early actions may include triggering agreed responses at regional or national level, such as pre-positioning of responders and emergency supplies and equipment, or the development of financial instruments to ensure a rapid response to, and recovery from, any disaster event. During a disaster, the IDOC will continue to monitor and map the situation in impacted areas and provide situation reports and mapping to ensure that decision makers have the information required to inform their decisions and to assist in the coordination of disaster response and recovery operations. Specific IGAD responsibilities related to individual MHEWS components are set out in table 2 below:

IGAD Level	
1. Disaster Risk Knowledge	1. Support MS in their Risk Knowledge work using a standardised methodology
	2. Collate and disseminate regional risk information and mapping, especially relating to transboundary risks, working in collaboration with regional partners and bodies.
	3. Facilitate coordination and collaboration between IGAD Member States on risk mapping and development of cross border disaster scenarios and early action plans at the regional level.
	4. To provide ongoing hazard monitoring information, data and mapping for stakeholders during response and recovery operations.
2. Detection, Monitoring, Analysis and Forecasting of the Hazards and Possible Consequences	1. The IDOC will coordinate monitoring, analysis and forecasting systems for identified hazards at the regional level on behalf of IGAD, working in collaboration with international, regional and national entities as appropriate.
	2. Establish Regional Monitoring and Warning Systems for identified hazards.
	3. The IDOC will provide hazard monitoring and forecasting at the regional level and support those established at MS level to assist in ensuring that they are effective and operational.
3. Warning Dissemination and Communication	1. Establish organizational structures and decision-making processes for dissemination and communication of warnings and situation reports.
	2. Ensure communication systems and equipment are in place and operational, and encourage MSs to adopt the Common Alerting Protocol (CAP).
	3. Ensure that impact-based warnings are communicated effectively to prompt effective early action by decision makers and target groups.
	4. Establish feedback mechanisms to assess the performance of warning dissemination structures.

4. Preparedness and Response Capabilities	1. Ensure that regional disaster preparedness measures, including Early Action and response plans, are developed and operational, and support MS in their own early action planning.
	2. Ensure that regional public awareness and risk education campaigns are developed, coordinated and delivered.
	3. Ensure that regional Early Action and response plans are tested and evaluated.
5. Governance and Institutional Arrangements	1. Ensure that early warning is secured as a long-term regional priority and that decision makers are sensitised on the financial benefits and return on investment that is provided.
	2. Ensure that legal and policy frameworks to support Early Warning are adequate or propose revisions as necessary.
	3. Continually assess institutional capacities for early warning at regional and MS levels, making proposals for improvement as necessary.

Table 2: IGAD Level Responsibilities for MHEWS

4.4.1 IDOC Links with Continental and National Level

The IDOC, as the MHEWS Situation room for IGAD, is responsible for formalising links with similar functions established at MS and continental levels. It is fully appreciated that at the commencement of the seven-year MHEWS Development Programme MS may not have all of the necessary components to deliver the IGAD MHEWS Model in place. However, it is anticipated that during that seven-year programme, the IDOC will support MSs in development of the necessary structures, including establishment of an MHEWS situation room within each MS, or nomination of an existing agency or facility to undertake that role and function. This network of MS MHEWS Situation Rooms within the IGAD Region will be piloted and expanded during the development programme period, allowing existing Early Warning Systems to be enhanced and incorporated into the regional system over time.

The architecture for the continental MHEWS provides a network approach for IDOC to communicate with the continental situation room and counterparts in other RECs. These MHEWS structures are not intended to replace existing bilateral communication arrangements, but rather to enhance them through robust communication and coordination policies, which will allow 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 that ensures that data and information sharing can be achieved through multiple channels in order to make the process more redundant and reliable. For example, climate data and information sharing is provided in both directions between sub-national, national, regional, continental and international bodies.

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 (DIMS) at IGAD and national levels is a priority. This allows data and information to be inputted to the system by authorised users at any level and then be automatically and instantly available to other users with authorised access to the system without the need to generate further reports or information returns. Whilst a common database and DMIS can be used, different users can be given different levels of access to data and information, in accordance

with protocols to be agreed at IGAD level.

This will facilitate the instantaneous sharing of data and information and ensure common situational awareness at all levels and across all sectoral partners. For example, if several Member States are dealing with a major flood event, the information that they each input to their own DMIS, or emanating from their own national hazard monitoring system, will not only trigger their own early warnings and Early Actions but will automatically inform the IDOC about conditions so that they can consider issuing a regional warning should potential transboundary impacts be identified. Similarly, the information, data and mapping produced at the IDOC will be made available to National and Continental MHEWS situation rooms in accordance with pre-agreed levels of access, enabling them to determine their own warning and early action requirements.

A general schematic of the networked MHEWS facilities at national and IGAD levels, along with an illustrative list of coordination stakeholders at each level, is set out below at figure 6.

In short:

1. The IDOC acts as the MHEWS Situation room for IGAD and issues regional warnings. The IDOC liaises with all regional level partners, and links to all Member State MHEWS situation rooms and the continental MHEWS situation room.
2. National MHEWS situation rooms collate all national information and issue national warnings, liaise with all national level partners, and establish links to all sub-national entities or situation rooms, and the IDOC.

This networked structure is designed to ensure effective sharing of data and information across jurisdictional boundaries to inform warning system design and early action planning. Once a hazard event is identified, the same structure ensures the effective dissemination and communication of warnings and alerts generated at each level.

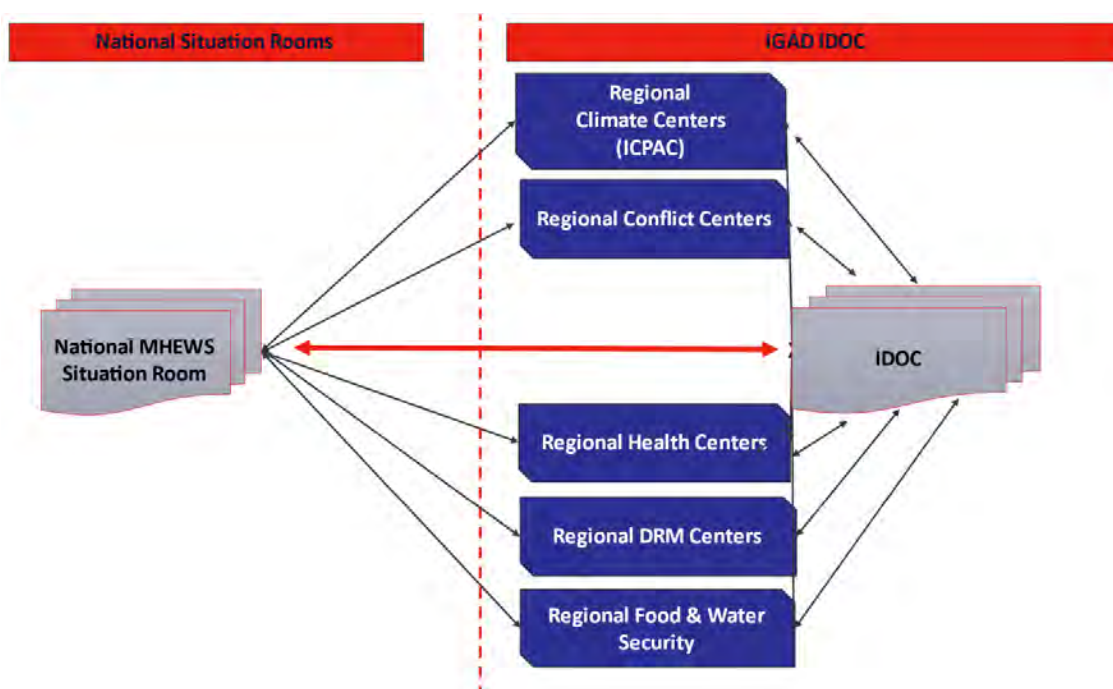


Figure 7: IGAD Regional MHEWS Structure

Chapter 5

Model National MHEWS

Operational Framework

5.1 National Level Roles and Responsibilities for MHEWS

The IGAD MHEWS Institutional Framework recognises that MSs have the primary responsibility for identifying and monitoring hazards, issuing warnings, and initiating Early Action. Each member state in the IGAD Region will therefore determine and establish its own arrangements according to its specific needs, laws and context.

The IGAD MHEWS Institutional Framework sets out model guidance that may inform national decisions, including the establishment of functional requirements and some minimum criterion that they should work toward in developing their own MHEWS. Warnings issued by MSs need to be timely, localised, granular and impact-based in order to facilitate effective early action at the appropriate level. Most national MHEWS have at their core the national and sub-national warning systems for single hazards operated by entities such as national metrological or hydrological agencies. Those national agencies may be supported through localised and community-based systems providing warnings for specific hazards in specific locations only.

Regardless of the structure determined by each MS, the systems they put in place must be capable of triggering effective early actions to prevent or reduce the impact of the hazards being monitored. The establishment of a MHEWS facility or situation room at the national level is intended to ensure that all hazard warnings and information, regardless of hazard type, can be assimilated and assessed. The MHEWS facility can then disseminate and communicate national level warnings to those required to act. The MHEWS facility will also act as the single point of contact between the IDOC and the MS in relation to early warning and early action information.

A further role for MHEWS facilities at the national level is to monitor and assess situations where hazards could present a risk of transboundary impact with neighbouring countries. In these circumstances, national MHEWS facilities must coordinate with IDOC to ensure effective coordination of warnings and the sharing of data and information with other impacted or potentially impacted MSs. Whilst some MS may wish to consider development of a new and purpose-built MS MHEWS facility or situation room within the seven-year MHEWS programme to improve their national warning services or include development of the facility in any existing projects to establish a national emergency operations centre, the function could equally be allocated to an existing agency or body utilising existing facilities. These are decisions for each MS to consider, and the role of the IDOC is to provide advice and support to MSs whichever approach they decide to take.

Specific national responsibilities related to individual MHEWS components are set out in table 3 below:

National 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 regional 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 identified 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 for dissemination and communication of warnings, including the establishment of a national MHEWS facility.
	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 includes last mile connectivity to ensure warnings reach all those required to act, including vulnerable groups.
4. Preparedness and Response Capabilities	1. Ensure that disaster preparedness measures, including response and Early Action Plans, are developed and operational at national, sub-national and community levels.
	2. Ensure that public awareness and education campaigns are conducted. These could include various risk sensitisation products such as posters, newsletters, fact sheets, radio and television programs, radio dramas, movies and websites.
	3. Ensure that public awareness and Early Action Plans are tested and evaluated.
	4. Ensure MHEWS data and analysis is made available to inform national and sub-national disaster response planning and any response actions.
	5. Organize regular exercises at national and sub-national level to test and optimise the effectiveness of Early Warning dissemination processes, preparedness arrangements and response to warnings.
5. Governance and Institutional Arrangements	1. Early Warning is secured as a long-term national and sub-national priority and funding is secured accordingly.
	2. Ensure comprehensive legal and policy frameworks are in place to support Early Warning, setting out roles and responsibilities for each early warning component at national and sub-national level.
	3. Institutional capacities for all individual MHEWS components are assessed and enhanced.

Table 3: National Responsibilities for MHEWS

Model guidance to assist IGAD Member States in implementation of MHEWS is set out below for information but will need to be adapted at national and sub-national level to reflect the precise context and circumstances of each country. It should also be noted that whilst the IGAD MHEWS Model reflects the ideal situation that MSs will work toward over the seven-year MHEWS Programme, it is not expected that MSs will be in a position to establish the multi-hazard model immediately. More likely, MSs will commence by strengthening existing warning systems and building capacities of relevant bodies responsible for individual warning system components, such as DRM, metrological, hydrological and local government agencies.

5.2 Recommendations for Operationalization of the Regional MHEWS Model at National Level

The draft model set out in this Framework proposes MHEWS roles and responsibilities for individual MSs to consider and suggests ways in which their responsibilities under the regional MHEWS may be delivered. However, it is a matter for individual MSs to determine how they wish to operationalise MHEWS at their respective levels.

The proposed MHEWS Model set out in figure 8 below recognises that to deliver a truly multi-hazard warning system, it must have flexibility to accommodate a range of monitoring, forecasting and alerting agencies over time, each working to their own sectoral mandate and providing information and warnings on the hazards for which they are responsible. At the commencement of the MHEWS program, it is likely that key agencies will include those responsible for monitoring metrological, hydrological and geological hazards, and monitoring associated impacts such as drought and food security. Over time, additional monitoring agencies may be incorporated, each responsible for issuing warnings related to specific hazards. The intention is that over time, all warning systems, regardless of the hazard they are monitoring, may be accommodated within a single overarching MHEWS structure.

Those Agencies currently listed in the model relate primarily to natural hazards and are intended to be illustrative only. Some MSs may not have all those agencies listed, other MSs may have additional agencies that should be included. The single MHEWS system and coordination architecture is intended to be flexible and adaptive over time, so that it can be expanded to support all hazard monitoring agencies and early warning types in the future. Whilst hazard monitoring agencies will differ, many of the remaining warning system components, such as risk knowledge and communication and dissemination structures and equipment, may serve a multi-hazard purpose and support the work of multiple hazard monitoring agencies. This approach will both enhance resilience of these structures, and reduce early warning costs for the MS.

In the proposed model, all warning information and data generated by monitoring, forecasting and alerting agencies is shared with a single coordinating function or MHEWS situation room that will then aggregate and evaluate the information before triggering and disseminating warnings as required through multiple warning dissemination agencies and channels. MHEWS situation rooms also provide a focal point for communication and dissemination of warning data and information between the national and sub-national level, and between national and the IDOC, helping to address transboundary risks and warning issues. It is a matter for MS to determine how a national MHEWS function or situation room should be established and by which agency. This is explored below at 5.2.1 below.

In summary, it is proposed that Member States work toward establishment of a National MHEWS structure consisting of:

1. **A National MHEWS Technical Working Group** with representatives from all relevant ministries, departments and agencies. These multi-agency stakeholders must work together to guide and direct the establishment of MHEWS at national and sub-national level.
2. **A lead body** mandated to coordinate collection of the various warning data, information and warnings from all hazard monitoring entities, and then further disseminate and communicate those warnings through multiple channels as required. This includes sharing data, information and warnings with sub national entities and the IDOC as appropriate. It should be noted that nomination of a lead agency to coordinate the contribution of all MHEWS stakeholders and individual warning system components need not change the statutory remit of specific agencies, such as hazard monitoring or disaster response agencies.
3. **Hazard monitoring entities as required to monitor the priority hazards** that have been identified for the MS. These entities may operate at national and / or sub-national level, and be given responsibility for monitoring specific hazards and then issuing a warning should pre-agreed hazard parameters be breached (through, or in collaboration with, the MHEWS situation room facility).
4. **Multiple warning dissemination and communication channels** that can support multiple hazard monitoring services and through which warnings for any type of hazard may quickly be issued to those required to act, including last-mile connectivity to the most vulnerable.
5. **Mechanisms to plan for, and deliver, effective early action.** National and sub-national preparedness and risk sensitization arrangements to ensure that those required to act develop appropriate early action plans and practice them so that they know what to do should a warning be issued.

This illustrative MHEWS structure at National level, and its links to IDOC and Continental levels, is shown below in figure 8.

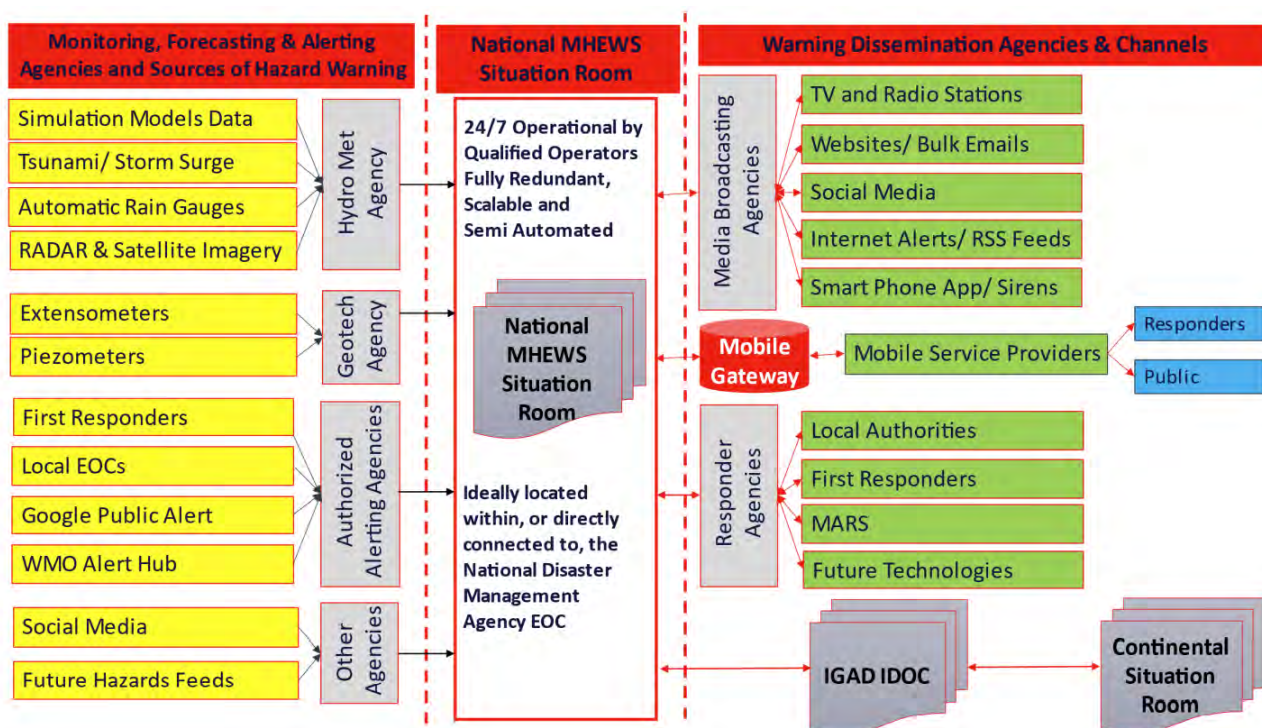


Figure 8: Illustrative Long Term MHEWS Structure at MS level.

5.2.1 Establishing a National MHEWS Lead Agency

Although the specific arrangements will differ in each IGAD MS, all have established sectoral Ministries, Departments and Agencies (MDAs) to provide hazard monitoring, forecasting, and warnings. For example: national meteorology, hydrology or health agencies. They have also established a range of MDAs responsible for DRR or civil protection and emergency planning at community, sub-national and national levels. Between them, these various MDAs provide all of the components that would be necessary to deliver an end-to-end early warning system capable of delivering effective early action. Generally, each of these agencies will be empowered and funded through their own sectoral legislation to provide specific components of the end-to-end warning system.

However, a challenge observed in many MSs is that no single body has overall responsibility for leadership and coordination of all warning system components, or to ensure that an effective and end to end system is delivered in practice. In the absence of a single coordinating body for early warning, there is a high risk that individual warning system components, such as metrological forecasting, may be developed to a high standard, but other components, such as warning dissemination or early action planning, could be missing or developed in isolation. There is little point investing in hazard monitoring and warning systems if those warnings don't reach those required to act and do not deliver the early actions necessary to save lives and reduce losses. Effective coordination of all required warning system components, and the various technical agencies responsible for each of those components, is an essential prerequisite of the IGAD MHEWS Framework.

To ensure effective coordination of MHEWS, the IGAD Framework proposes that whilst the role of sectoral hazard monitoring or DRM agencies is a matter for MSs and should be unchanged, that there are operational benefits in nominating a single MDA to take overall responsibility as lead agency for coordination of warning system delivery. This lead agency role must include the power to convene and coordinate all of the various partners responsible for individual Early Warning System components, ensuring there is a harmonised end to end system in place and not simply a number of disconnected individual components. This national lead agency should also be given responsibility for establishment of the national MHEWS situation room, where data, information and warning messages from the various hazard monitoring entities can be aggregated and disseminated effectively to all those required to act. The national MHEWS Situation Room will also provide the formal link and single point of contact for exchange of warning data, information, and messages between the national level and IDOC, and through IDOC, onward to Continental levels.

Where a lead agency for coordination of all MHEWS partners is not already established, MSs must consider and determine the most appropriate MDA to undertake this responsibility. Given the Multi-Hazard nature of the IGAD MHEWS, it is recommended that National Disaster Management or Civil Protection Agencies are ideally placed to undertake this coordination responsibility given that they already work across all sectoral hazard disciplines and generally have primary responsibility for vulnerability and risk assessment, warning dissemination and communication, and preparedness and early action planning. Appointment of DRR MDAs to coordinate MHEWS would also enable MSs to utilise any existing emergency operations or disaster management centre facility to undertake the additional functions of a MHEWS Situation Room.

Regardless of which body is appointed to coordinate MHEWS at MS level, they should be granted sufficient authority to ensure they can convene all necessary sectoral stakeholders involved in delivery of MHEWS components. At MS levels, this includes at national and sub-national level stakeholders from local government and departments or agencies responsible

for meteorology, hydrology, DRR, health, conflict, drought, and food security.

5.2.2 Setting Up 24/7 MHEWS Situation Rooms

Given that there may be multiple agencies monitoring individual hazards and generating warnings that need to be disseminated, communicated and acted upon, it is proposed that each MS should establish a single MHEWS situation room function. The purpose of the MHEWS situation room is to coordinate and aggregate data and information relating to early warning from all of the hazard monitoring agencies. When identified thresholds for warning have been breached, they will then disseminate and communicate warnings as required at the national and sub-national level.

Linkages between the MHEWSs Situation rooms at national, IGAD and continental levels also creates a network to facilitate the formalised two-way 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 greater partnership working and data exchange, which will reduce warning system operating costs.

Although the term “situation room” has been adopted to describe the MHEWS function, this does not require construction and staffing of entirely new facilities at MS levels where there may already be existing units or facilities available 24/7 that could take responsibility for the function.

Whilst it is a matter for MSs to determine the most appropriate way in which to establish a national MHEWS situation room, it is noted that most MSs have arrangements to establish National Emergency Operations Centres (NEOCs) to coordinate disaster response, either at a purpose built NEOC facility or by bringing together relevant stakeholders at some other location under the direction of a Disaster Management Agency (DMA) or similar national coordinating body. Where this is the case, the most efficient way of introducing the MHEWS situation room function may be to extend the remit of the NEOC / DMA to include responsibility for operation of the MHEWS situation room function, potentially with the secondment of specific technical staff from hazard monitoring agencies to provide technical assistance. An example structure based on commonly used national DRM structures is set out at Figure 9 below.

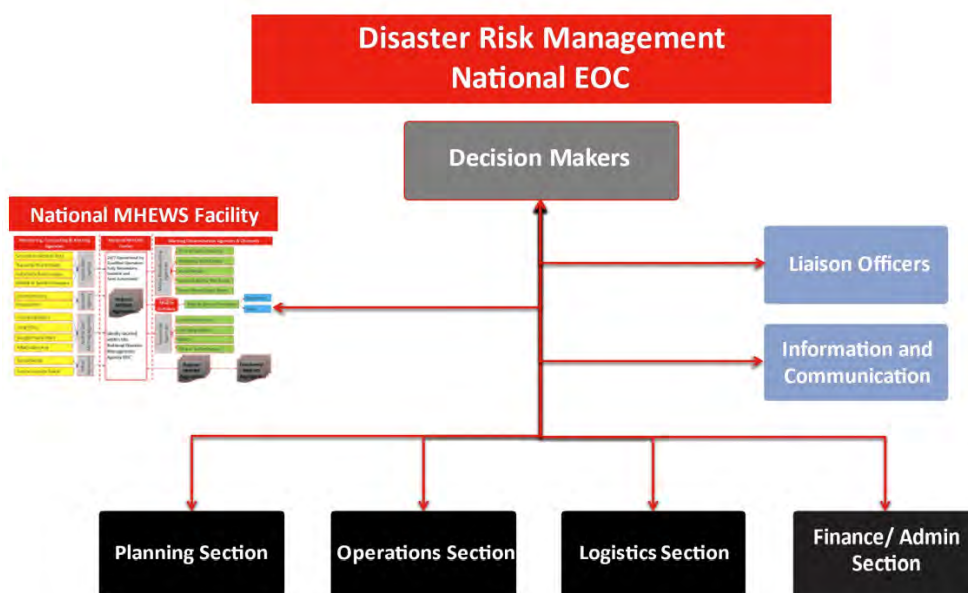


Figure 9: Example Structure of MHEWS Within a typical EOC Facility at Member State Level

The added advantage of this approach for MSs is that co-location of the MHEWS and DRM / NEOC facilities will make it easier to integrate information provided by hazard monitoring agencies for early warning purposes into disaster response and recovery operations. Whatever structures are adopted for MHEWS situation room facilities at MS level, they should fall under the jurisdiction and leadership of a single ministry, department or agency and be clearly defined in Member State laws, decisions and policies.

The incorporation of MHEWS situation room responsibilities into an existing or future NEOC managed by DRR Units or agencies presents several advantages. They will support preparedness activities through the coordination of multi-agency and multi-sectoral information and data sharing, and provide hazard data and mapping to inform response planning and community risk sensitization. Having triggered timely Early Warnings and initiating Early Action, hazard monitoring data provided by the MHEWS situation room facility can continue to inform response and recovery efforts through the ongoing provision of hazard information, forecasts, nowcasts and mapping.

5.2.3 Training and Capacity Building for the National MHEWS Situation Room

The creation of a national MHEWS situation room does not change the role and responsibility of technical hazard monitoring agencies, such as national meteorological, hydrological, geological or health monitoring services. There may be operational benefits in having specialist staff from hazard monitoring services working on secondment to the MHEWS Situation room to assist in interpretation of information and data provided. Where this is not possible, MHEWS situation room staff will require training to enable them to understand the information provided to them by specialist agencies and ensure it is aggregated and disseminated in accordance with their SOPs and operational guidelines.

An initial task in establishing a National MHEWS 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 MHEWS situation room, and for the ongoing maintenance of those skills, incorporating any lessons learned once the facility is operational. IDOC can provide additional support and guidance on MS training and capacity building for operationalisation of national MHEWS situation rooms, based on the training developed for IDOC.

To assist in building institutional capacity and not just personal competence, it may be useful to develop standardised regional training and assessment packages, working with competence centres and universities that may also be able to provide accreditation and validation of training delivered.

5.2.4 Establishing Working Arrangements at and Between National Level and IDOC

The objective of augmented and formalised working arrangements at national and regional levels is to enhance the effectiveness of all warning systems to reduce losses through more timely and effective Early Actions. To deliver this objective and enable the IGAD MHEWS to function effectively, all concerned stakeholders at regional and national levels need to be actively engaged and come to an agreement on how each will fulfil their respective role in the overall system. This engagement and coordination task will be undertaken by members

of Early Warning Technical Working Groups (EW-TWGs) established at regional and national level.

An early task for the regional and MS EW-TWG will be to identify relevant stakeholders and work with them to formulate draft MoUs, SOPs or other guidance documents that capture the roles, responsibilities and ways of working agreed by the group. Once national MoUs, SOPs or other guidance documents are formulated in draft by working groups, MHEWS coordinators can liaise with decision makers to ensure that agreed working arrangements are formally adopted.

Each national EW-TWG will consider and establish the most appropriate working arrangements at their respective levels, taking account of existing coordination structures and country context. As a minimum, these arrangements should formalise the sharing and use of data, information, and observations, and the sharing of Early Warning System developments and good practices. This will ensure that data provided through national information gathering and sharing structures is validated by all sectors before being adopted into the national warning system and shared with IDOC. It will also ensure that any new technical developments or lessons learned in one sector, such as monitoring of meteorological or h events, can be shared with all other 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 for dissemination and communication of Early Warning messages through the various platforms hosted by partner agencies, such as their websites, RSS Feeds, emails, social media platforms, and mobile applications. Ultimately, the goal is to ensure the quality and consistency of all Early Warning information by adopting the Common Alerting Protocol (CAP) and ensuring information can be aggregated and disseminated automatically through multiple and diverse platforms to reach the maximum number of stakeholders.

Where the National MHEWS situation room and any National Emergency Operations Centre (NEOC) for response and recovery are established in separate facilities, a critical MoU will be the one agreed between them that sets out clearly the roles and responsibilities of each. In general terms, the MHEWS situation room will be responsible for monitoring hazards and initiating warnings and early actions prior to a disaster event, and the NEOC for managing response and recovery activities once the anticipated hazard impacts. Whilst the MHEWS Situation Room will not lead disaster response and recovery operations, once an event has impacted and response is being managed by NEOC, the situation room will continue to provide hazard forecasts, data and mapping to the NEOC so that planners and Decision Makers have access to the best available hazard information. Obviously, where the two roles are undertaken as part of a single facility, these coordination arrangements will be greatly simplified, with the MHEWS Situation Room team providing data, information and mapping that will be used by decision makers managing response and recovery.

5.2.5 Communication and dissemination arrangements

A critical requirement of the national MHEWS is to ensure the effective communication and dissemination of information required for Early Warning across sectoral and jurisdictional boundaries. Adoption of an integrated IT system capable of providing improved 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 for their specific purposes. The UNDRR document, “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-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-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 in 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 national communication and dissemination arrangements, EW-TWGs should engage Stakeholders from each sectoral and jurisdictional agency responsible for MHEWS 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, subnational and local level 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).
- Communication strategies evaluated to ensure messages are reaching the population and all categories of population.
- Agreements developed to utilize 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 utilize 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.

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 subpopulations, 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.

Chapter 6

IGAD Program for Development of MHEWS

6.1 Overview of the IGAD Program for Development of MHEWS

Delivery of the IGAD MHEWS requires a multi-year programme of engagement and capacity building that will be delivered in two distinct phases set out over seven years. The programme is designed to allow necessary discussion and stakeholder engagement on key decisions and the time necessary to establish supporting structures at Member State levels. The programme includes annual review by IGAD decision makers so that parts of the programme can be accelerated and delivered more quickly if circumstances permit. Further detail on the proposed programme plan is set out in Annex 1, however, an overview of the two phases is set out below.

Phase 1: Development Phase and Operationalisation of MHEWS at Regional Level (3 years)

This phase shall commence with establishment of decision-making and technical working groups at regional and Member State (MS) levels to guide MHEWS development. At regional level, the priority will be early operationalisation of the IDOC. This will not only deliver immediate benefits to Member States but will provide assistance in coordination of the regional programme and the effective exchange of early warning data and information between Member States.

For Member States, the early priority will be to sensitise decision makers and start work on capacity building for existing sectoral Early Warning Systems, concentrating on the enhancement of natural hazard systems as a 1st step toward MHEWS delivery.

During the development phase 1, the programme should have a light management structure as most activities will be related to sensitising decision makers and building of partnerships and capacity at regional and national levels. IDOC will play the role of overall programme management coordinator and will develop annual work plans that will be agreed with national counterparts. At least four regional consultation meetings per year (virtual or in person) will be organized to facilitate exchange of information and views between the regional and national MHEWS coordinators. This regular exchange of information and ideas will help to avoid overlap between programs, identify opportunities for partnership working, and help to reduce duplication of effort. MHEWS coordinators will also ensure that the programme delivers the outcomes agreed in the work plan document.

In addition to IDOC operationalisation, this phase includes continued development and capacity building for existing sectoral warning systems, such as natural hazards, and review and development of national MHEWS facilities / situation rooms in light of lessons learned in operationalising the IDOC. These lessons will be shared between all IGAD MSs and the regional program will be reviewed with any amendments submitted to Decision Makers for endorsement at the conclusion of phase 1 and prior to commencing work on phase 2.

Expected output:

Institutional architecture for the IGAD MHEWS programme is fully established and the IDOC fully operationalised. 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. Technical working groups at MS, REC and continental levels will guide the establishment of the MHEWS facilities / situation rooms at national level and development of SOPs and protocols for data exchange along with any recommendations made for procurement of common technical systems and equipment. The technical working groups shall have considered and analysed suitable long term MHEWS governance arrangements and budgetary arrangements and put forward proposals for consideration of decision makers.

Phase 2: MHEWS Piloting and Delivery at Member State Level (4 years)

This stage may involve further work to enhance legal and institutional arrangements at MS level as recommended by national experts during phase 1, development of SOPs and Operational Plans to support effective early action at MS level, and further expansion of the IDOC role to incorporate a wider range of hazards as required.

Expected output:

Operationalisation of the IGAD Framework at MS level and continued capacity building and support for MS in development of the necessary systems and structures required for delivery at MHEWS at national and sub-national levels. Development of proposals to sustain the MHEWS system into the long term, including the identification of any requirements to upscale the MHEWS and for identification of sustainable financing for the system into the long-term Program.

6.2 Delivering the IGAD Program

The IGAD MHEWS Programme will be coordinated by the IGAD-DOC and supported by multi-agency and multi-sectoral Early Warning Technical Working Groups (EW-TWGs) at IGAD and MS levels. IGAD, assisted by partners and stakeholders, will guide and direct this long-term process for MHEWS delivery and encourage investment, capacity building and improvement in current warning systems in the short- and medium-term.

IGAD MHEWS Programme includes several specific activities, each of which may be broken down further into specific additional actions required at regional or national level. Taken together, delivery of those key activities will support delivery of five specific outputs:

1. Establishment of the Regional IGAD MHEWS Programme.
2. Establishment of Common IGAD protocols and platforms for sharing data and risk information.
3. Enhancement of 24/7 Hazard Monitoring and Warning Services at IGAD and national levels, commencing with operationalisation of the IDOC.
4. Delivery of functional warning dissemination and communication systems at regional and national levels, including the vital “last mile” connectivity at MS and sub-national levels.
5. Development of protocols & materials for preparedness and early actions, including planning, training, and exercising.

These outputs are essential to support delivery of the overall objective of the IGAD MHEWS Programme 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. An overview of key activities, outputs, specific objectives, and the overall objective and impact are set out in Figure 10 below.

The programme itself is supported by an IGAD MHEWS delivery plan, set out at Annex 1. This sets out in more detail some of the anticipated actions required to deliver the activities and outputs set out in the seven-year programme. An important feature of the proposed IGAD MHEWS delivery plan is an annual appraisal by technical working groups and decision makers to enable them to evaluate developments and adapt the delivery plan as necessary. Given the proven benefits of MHEWS in saving lives and reducing disaster losses, decision makers should consider the completion date targets set out in the outline MHEWS delivery plan as the maximums and should bring elements of the MHEWS Program forward for action and adoption more quickly whenever technically possible.

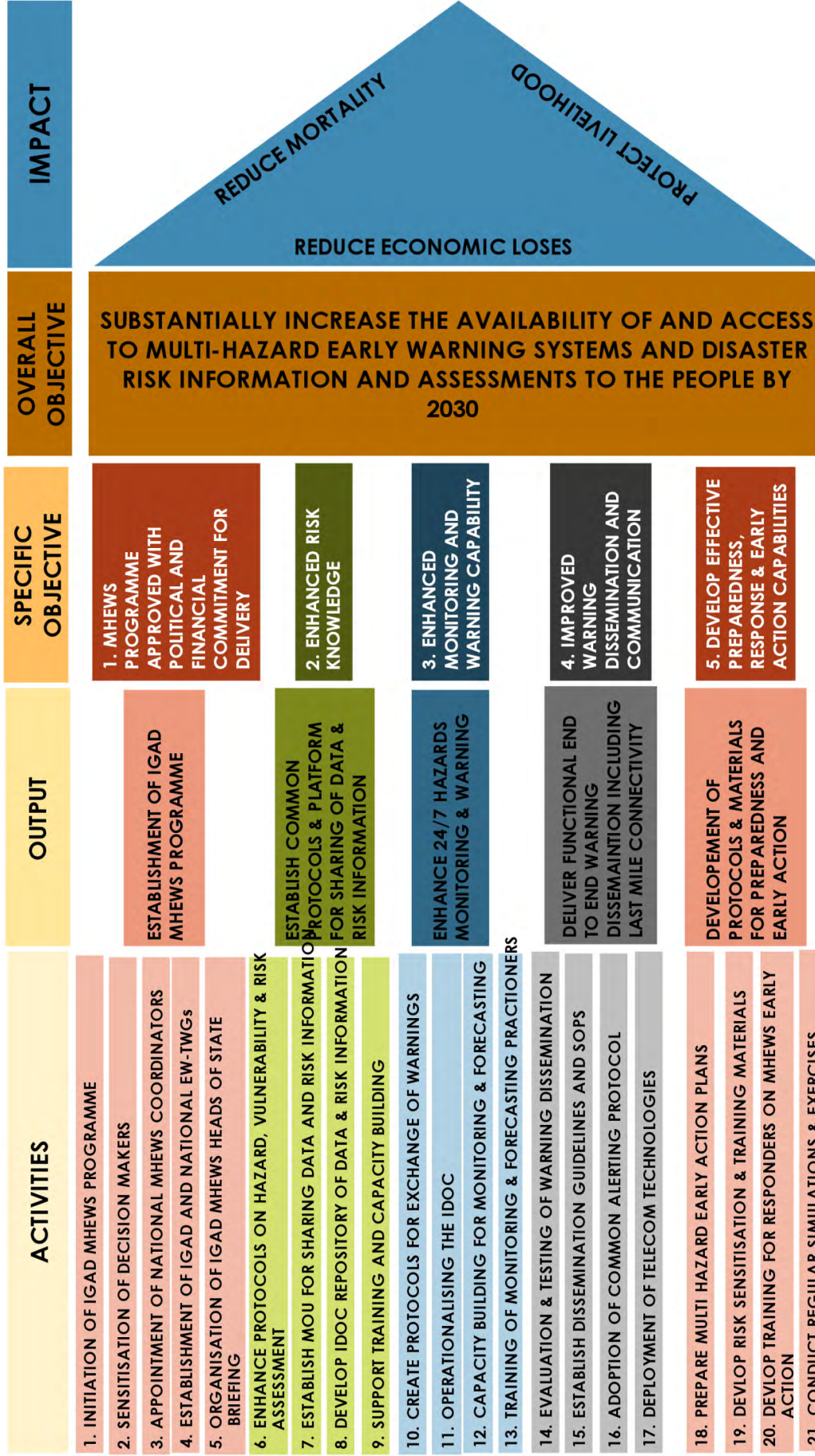


Figure 10: Overview of MHEWS Program

6.3 Governance Arrangements for the IGAD MHEWS Program

Delivery of the MHEWS Programme requires the full support of decision makers at all levels. The Continental Framework, setting out many of the principles and structures established in the IGAD Framework, is set to be launched with a sensitisation of decision makers through a Continental MHEWS Program Development Conference, organised by AUC-DARBE. This will formally initiate the continental element of the MHEWS Programme.

The Continental MHEWS Program Development Conference should consider and propose the appropriate governance and reporting arrangements for delivery of the MHEWS 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 MHEWS delivery during the seven-year MHEWS Development Programme.

The IGAD MHEWS Institutional Framework mirrors the governance arrangements proposed in the Continental Framework, the most important of which are:

MHEWS Coordinators: senior figures appointed at Member State and regional levels to act as the champion and focal person for development of the IGAD MHEWS and its components.

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

An illustration of the communication structure for MHEWS linking Coordinators and EW-TWGs at each level is set out below in Figure 11.

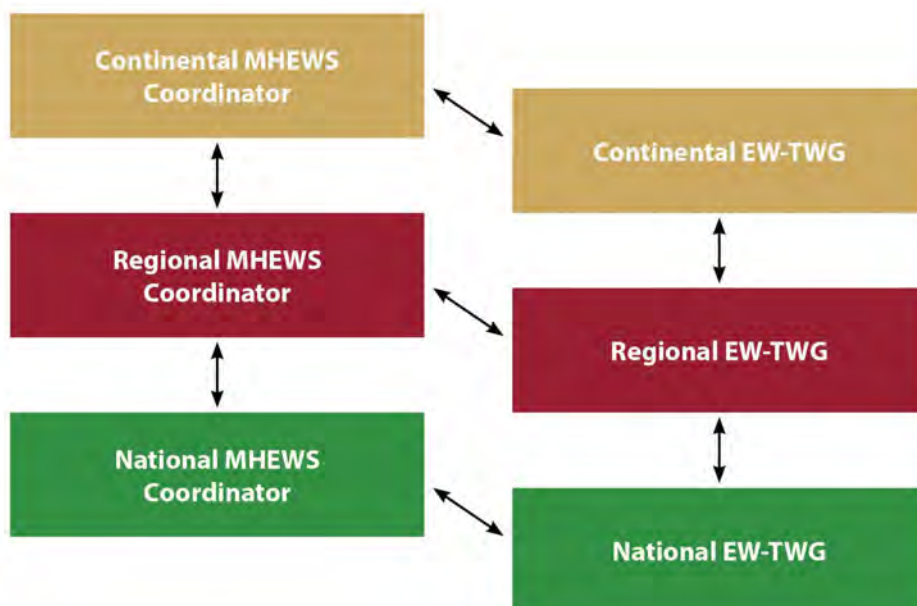


Figure 11: MHEWS Governance Structure - Continental Overview

At Member State level in particular, it is recognised that existing barriers to effective Early Warning System delivery include outdated legal and institutional arrangements that in turn can result in poor coordination across sectoral disciplines. Lack of clarity over roles and responsibilities for various early warning components also leads to a lack of funding and technical capacity for their delivery. Working in partnership across MSs and the regional level can help to address these issues, reducing the cost of warning system delivery by avoiding duplication of effort and ensuring shared access to data, information, and technical specialists. The financial savings and savings in technical specialists’ time resulting from improved collaboration and coordination can be redirected by MSs to where it can deliver best effect.

An additional challenge identified at all levels is that of integrating the work of multiple sectoral stakeholders responsible for individual warning system components into a single “end to end” warning system. The efforts of sectoral specialists responsible for tasks such as risk knowledge, hazard monitoring, dissemination and communication of warnings, and preparedness and response, must be coordinated into a single system. EW-TWGs provide a forum to bring these diverse stakeholders together so that they can reach mutually agreeable and beneficial solutions to Early Warning challenges. A model MHEWS governance structure at MS level is set out below at Figure 12. The structure and national stakeholders listed are illustrative only; it is a matter for MSs to determine the appropriate structure and stakeholder list to meet their specific situation and context. The key objective MS should seek to address is to ensure full and multi-sectoral participation in EW-TWG.

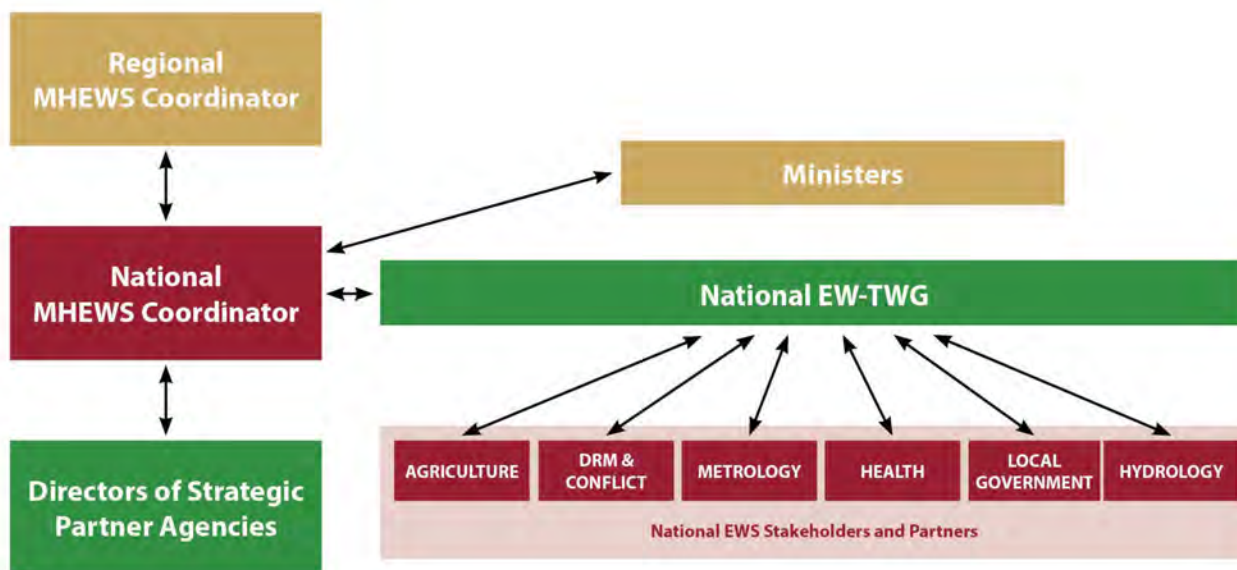


Figure 12: MHEWS Example Governance Structure - National Overview

6.3.1 Appointment of MHEWS Coordinators

It is proposed that the position of a MHEWS coordinator be established within the IDOC and all IGAD Member States. To support MHEWS 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 by their appointing body to identify and then 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 at national and sub-national levels responsible for risk assessment, warning dissemination and preparedness activities.

Although the initial phase of the IGAD MHEWS development program is concentrated on sensitisation of decision makers and enhancement of Early Warning for natural hazards, MHEWS Coordinators should make early contact with counterparts from warning system operators for other hazards within their respective jurisdiction, such as health and conflict. This will ensure that any opportunities for data sharing and partnership can be identified and actioned at an early stage in the programme, and lessons learned in one sector can be shared across all warning system sectors.

The regional MHEWS coordinator will act as the focal point for the seven-year MHEWS programme and will put in place and monitor plans to deliver the programme in line with the agreed programme plan. MHEWS coordinators at MS levels will support the regional coordinator in their task, and act as the expert adviser at national level on Early Warning System design, providing briefings and guidance for decision makers as and when required.

The MHEWS coordinator position need not be a full-time commitment, and at the MS level in particular, this role may be allocated to a suitable senior manager with existing responsibilities for coordination of DRR or Early Warning System development. However, there may be benefits in establishing the IGAD MHEWS coordinator as a full-time role, allowing the post-holder to act as overall regional program delivery manager in addition to their coordinator duties.

Key selection criteria for MHEWS coordinators at all levels include a good understanding of the technical requirements for an end-to-end Early Warning System, and preferably technical experience in delivery of at least one of the four warning system components. Individuals selected as MHEWS 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 MHEWS Program.

The roles and responsibilities of MHEWS coordinators at MS and REC levels are very similar, although their respective operating environments will be very different. The precise job descriptions and terms of reference for each MHEWS 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 appointing bodies in selection of suitable candidates for the role.

Essential Experience

- Senior management experience within a Hazard Monitoring or DRM Unit, ministry, department or agency, including experience in working with, and reporting to, decision makers.
- Recognised qualifications in a specialist hazard monitoring discipline (i.e. hydromet, health or conflict), or similar qualifications in DRM, civil protection, or similar disciplines.
- Experience in project or programme management and production of technical papers and reports.
- Excellent interpersonal skills and the ability to communicate and work effectively with multi-agency and multi-sectoral partners.

Desirable Experience

- Management and delivery of an existing Early Warning System,
- 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.
- Strategic planning and budgetary experience.

6.3.2 Roles and Responsibilities of the MHEWS Coordinator

Roles and responsibility for MHEWS coordinators will depend on the structure and context of each MS and the IDOC. However, the following examples are illustrative of the types of role and responsibility anticipated:

1. Identify and map Ministries, Departments, Agencies (MDAs) and partners responsible for delivery of Early Warning System components, or for operating sectoral Early Warning Systems at their respective level (national or regional).
2. Engage actively with these MDAs and partners to identify a suitable representative with experience in EW to become a member of Multi-Hazard Early Warning Technical Working Group (EW-TWG).
3. Establish an Early Warning Technical Working Group (EW-TWG) at the level for which they are responsible and agree on a term of reference with decision makers aligned to delivery of the MHEWS Program but contextualised to local needs, existing structures, and circumstances.
4. Establish a team to act as secretariat to the EW-TWG.
5. Report to senior level administrative and decision makers at their respective level on Early Warning and Early Actions.
6. Act as the focal person and main liaison point between the various MDAs involved in Early Warning delivery at their respective level, and as national or regional point of contact on MHEWS matters for external partners.
7. Engage with all EW stakeholders at their respective level 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.
8. Supervise the implementation of decisions, projects and programmes related to Multi-Hazards Early Warning System at their respective levels.
9. Sensitise decision makers at their respective levels on the benefits and requirements for MHEWS. This should include the development and presentation of “invest to save” business cases for MHEWS that emphasise the strong return on investment that may be delivered through the allocation of adequate and sustainable funding for MHEWS.

In addition, the IGAD MHEWS coordinator will be responsible for:

1. Acting as the lead and focal person for MHEWS within the IDOC.
2. Acting as adviser to IGAD on Early Warning and Early Actions.
3. Preparing draft decision papers on MHEWS to be tabled to the IGAD heads of state or such other forums or committees as required.

One of the key roles for MHEWS 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 IGAD and national MHEWS, both in human and financial terms, is fully understood. Achievement of MHEWS by 2030 will require

a strong political commitment translated into appropriate legislation and funding decisions, especially during Phase 2 of the IGAD MHEWS Program. MHEWS Coordinators have a critical role in delivering this commitment, acting as advocates for Early Warning and MHEWS development, and for ensuring that Decision Makers appreciate that there is a strong return on investment that may be delivered through a properly funded MHEWS.

6.3.3 Establishment of Early Warning Technical Working Groups (EW-TWG)

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 across organisational and jurisdictional boundaries. It also reduces the costs and burdens for 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 IGAD MHEWS Development Programme. Early Warning Technical Working Groups (EW-TWG) should be established at MS and REC levels to lead and provide technical input to this long-term capacity building and harmonisation process.

To be effective, EW-TWGs must be multi-agency, multi-sectoral Bodies. Membership should include all sectoral warning system operators, including natural hazards, health and conflict. In addition to being multi-sectoral, EW-TWGs should include representation from all MDAs within their respective jurisdiction mandated to deliver essential Early Warning System components, including risk knowledge, hazard monitoring and warning, dissemination and communication of warnings and preparedness and response. EW-TWGs should fully reflect the diverse range of stakeholders that need to be engaged and incorporated into the MHEWS delivery program.

Where appropriate, EW-TWGs may establish sub-groups or task and finish committees to deal with specific technical or sectoral issues; for example, groups working on warning dissemination and communication, or dealing with sectoral issues related to specific hazards such as meteorology, hydrology, geology, health, or conflict. However, those subgroups 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 MHEWS 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.

6.3.4 Terms of Reference of the Early Warning Technical Working Groups (EW-TWG)

Key duties of the EW-TWG include, but are not limited to, the following:

1. Provision of technical support for the design and delivery of the MHEWS 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 between all relevant stakeholders relevant to Early Warning System provision.
4. Sharing advice, guidance, and information on potential external funding sources for MHEWS capacity building and assisting MHEWS 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 warning system operation and for coordination between relevant Stakeholders.
6. Developing protocols for development and activation of Early Actions.
7. Providing guidance and assistance for the establishment of MHEWS situation room/ facility at their respective levels.
8. Supervise the implementation and operationalisation of the MHEWS situation rooms/ 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 IGAD EW-TWG will be responsible for:

1. Assisting the IDOC in its work to establish an effective regional MHEWS.
2. Reviewing the IGAD MHEWS Operational Model during Stage 2 of the MHEWS Programme and updating it considering any lessons learned.
3. Development of a programme for implementation of the regional MHEWS and provision of periodic reports and updates on progress toward that plan.

MHEWS coordinators will play a critical role in their respective EW-TWGs, providing leadership, encouragement and support for the various technical and sectoral experts forming the group. Working together under the leadership of IDOC, MHEWS coordinators and EW-TWGs will together establish the strategic network required for MHEWS policy formulation and information exchange, providing a robust link between national and IGAD levels. EW-TEGs also provide a forum where multi-sectoral experts can share data and information and liaise on Early Warning system development, including work to develop business case examples demonstrating return on investment, and work together to attract external funding support for capacity building and training. EW-TWGs are responsible for the provision of technical input for IGAD MHEWS delivery programme, and for providing an expert source of technical advice and support for capacity building and improvement of existing Early Warning Systems.

During Phase 1 of the IGAD MHEWS development programme, EW-TWGs will concentrate on sensitising decision makers and securing a strong political and financial commitment to MHEWS delivery. Other Phase 1 priorities include input and technical support for operationalisation of the IDOC and capacity building of existing national and regional level Early Warning Systems related to natural hazards.

By regularly sharing information and experiences, EW-TWGs can help to ensure that any 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 IGAD MHEWS in the long-term. For example, developing and sharing standardised SoPs for data and information exchange at the MS and REC levels will improve the effectiveness of those systems and reduce the costs and burden of developing separate SoPs for each project.

6.4 Coordination and decision-making meetings to direct the IGAD MHEWS Programme

1. **IGAD MHEWS Programme Development Conference (Programme Initiation)** – High-level conference for multi-sectoral decision makers to formally adopt the IGAD MHEWS Framework and initiate the MHEWS Programme. A concluding conference will also be held to formally review and close the seven-year programme.
2. **IGAD MHEWS Programme Workshop (3 times per year)** – IGAD Regional Workshop / Meeting held virtually or in person to work toward delivery of the MHEWS Programme at MS and IGAD level, to facilitate exchange of data and information between all MSs within the region and between MS and IDOC. The workshops / meetings also provide an opportunity for MHEWS coordinators to meet and exchange their views and experience, identifying opportunities for collaboration and capacity building. IGAD MHEWS meetings may be scheduled to coincide with seasonal changes to allow discussion of the upcoming season and any specific Early Warning challenges arising. One of the meetings will be designated the Annual Meeting for more formal programme review purposes.
3. **Biannual MHEWS Summit** aligned to the Africa Working Group on Disaster Risk Reduction (AWGDRR) to update key decision makers on the MHEWS Programme and seek support for any proposed programme amendments.

Chapter 7

Draft Implementation Plan for the IGAD MHEWS Program

7.1 Implementation Plan for IGAD MHEWS Programme

An overview of the high level IGAD MHEWS Programme Log Frame is set out at 6.2 and illustrated in Figure 10. This identifies 21 generic activities to be addressed through the IGAD MHEWS seven-year programme. Each of these general activities is further expanded in the draft delivery plan set out in Annex 1. Those generic activities are designed to contribute toward the delivery of five outputs:

1. Establishment of the IGAD MHEWS Programme.
2. Establishment of Common Protocols and Platforms for sharing data and risk information.
3. Enhancement of 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 and early action.

In turn, delivery of these outputs will drive delivery of five and specific objectives at IGAD and National levels:

1. MHEWS programme approved with political and financial commitment for delivery
2. Enhanced risk knowledge
3. Enhanced monitoring and warning capability
4. Improved warning dissemination and communication
5. Effective preparedness, response and early action capabilities

When taken together, these activities, specific objectives and outcomes will assist in achievement of the overall IGAD MHEWS objective, aligned with Target G of the Sendai Framework for Disaster Risk Reduction 2015 – 2030, 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*”.

MHEWS coordinators and EW-TWGs at IGAD and Member State levels will need to develop detailed programme and project plans for their respective areas of responsibility following formal initiation of the seven-year programme. At that stage, additions and amendments may be required to the 22 primary activities of the IGAD MHEWS Programme to further take account of regional and MS priorities and context.

An immediate priority for MHEWS coordinators and EW-TWGs at regional and Member State levels will be to review and revise the draft delivery programme set out at Annex 1. Wherever possible, the terms of reference of existing projects and capacity building programs, along with the coordination structures, working groups and committees established to deliver them, should be adapted to enable them to support delivery of MHEWS without the need to establish new and additional projects and working groups.

It is recognized that in the majority of MS there will be significant training and capacity building needs, along with a need to sensitise decision makers on the contribution that MHEWS can make to reduction in disaster losses and protection of development gains. This sensitization and capacity building will be important throughout the seven-year programme, but a special priority in its first years. Opportunities to share the burden of this work by working in partnership within the IGAD Region and with the assistance of international organizations should be maximised.

The draft high level Program Delivery Plan set out in Annex 1 is intended to inform the work of EW-TWGs, providing a starting point for their deliberations. Whilst the overall and specific objectives set out in the plan should remain, EW-TWGs are at liberty to amend and extend the activities designed to ensure their delivery. This should be an early task for EW-TWGs once they are formally constituted.

It should be noted that where budget estimations have been included, these are intended to be illustrative only, and are based on an indicative set of assumptions and cost estimates. This IGAD MHEWS delivery plan should also be considered in light of the continental MHEWS delivery plan adopted by AUC, as this proposes some activities and costs that will be delivered at the continental level. MHEWS coordinators and EW-TWGs will be required to refine the IGAD broad estimates and present fully costed proposals to decision makers at their respective levels.

List of Annexes

- Annex 1 - Indicative IGAD MHEWS Programme Delivery Plan
 - Annex 2 - Binding and non-binding instruments creating the conditions for a functioning Continental MHEW and Early Action System
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List of Annexes

Indicative IGAD MHEWS Programme Delivery Plan

Specific Objective 1: MHEWS Programme approved with political and financial commitment for delivery											
Output 1: 1. Establishment of the Continental MHEWS Programme											
Timeline											
	Stage 1					Stage 2					
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
Activity 1. Initiation of IGAD MHEWS Programme.	Activities to be undertaken	Indicators	Budget (Estimation \$US)	Responsible Party	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
	Organise IGAD MHEWS Summit	Key Decision Makers from each MS attend the IGAD MHEWS Summit		IGAD	X						
	Attend continental MHEWS Summit.	IGAD representation at the Continental MHEWS Summit IGAD Program initiated.		AUC	X						
Activity 2 Sensitisation of Decision Makers	Actions to be undertaken	Indicators	Budget (Estimation \$US)	Responsible Party	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
	Develop Regional sensitisation materials setting out the benefits of MHEWS and demonstrating the positive return on investment.	Materials produced in year 1 and revised and updated annually to take account of developments.		IDOC	X	X	X	X	X	X	X
	Briefing Decision Makers at their respective levels on MHEWS benefits.	No. of key decision makers at regional and national levels received briefings on MHEWS		IDOC	X	X	X	X	X	X	X

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Activity 3 Engage dedicated MHEWS teams	Responsible Party	IGAD					
	Budget (Estimation \$US)						
Indicators	IDOC MHEWS team appointed						
Actions to be undertaken	Appointment of IDOC MHEWS team,						
Activity 4 Establishment of EW-TWGs	Responsible Party	IDOC and MSs					
	Budget (Estimation \$US)						
	Indicators	EW-TWGs established at IGAD and MS levels.					
	Actions to be undertaken	Identify EW-TWG Members and formally Convene Groups.					
Activity 5 Attendance at Continental Biannual MHEWS Conference	Responsible Party	AUC, RECs and MSs					
	Budget (Estimation \$US)						
	Indicators	EW-TWGs meet at least 3 times per year, virtually or in person.					
	Actions to be undertaken	3 x EW-TWG meetings per year.					
Activity 6 Enhance Protocols on Hazard, Vulnerability & Risk Assessment	Responsible Party	IGAD					
	Budget (Estimation \$US)						
	Indicators	Conferences delivered in years 3, 5 and 7.					
	Actions to be undertaken	Attendance of IGAD Representatives at biannual continental MHEWS Conferences					
Activity 6 Enhance Protocols on Hazard, Vulnerability & Risk Assessment	Responsible Party	IDOC supported by Continental level and MS EW-TWGs					
	Budget (Estimation \$US)						
	Indicators	Report identifying best practice in hazard, vulnerability, and risk assessment.					
	Actions to be undertaken	Review of existing protocols on hazard, vulnerability and risk assessment, identification of best practice.					
Activity 6 Enhance Protocols on Hazard, Vulnerability & Risk Assessment	Responsible Party	IDOC supported by					
	Budget (Estimation \$US)						
Indicators	Regional and Member State Guidance and						
Actions to be undertaken	Development of Regional and Member State						

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7				
Guidance and protocols on hazard, vulnerability, and risk assessment.	Actions to be undertaken Develop data sharing policy for sharing data and risk information, consult with Stakeholders at Continental, Regional and Member State level. Seek agreement on draft MOU at the Biennial MHEWS Conference.	Draft data sharing policy developed	Indicators	Budget (Estimation \$US)	Responsible Party	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
						X		X				
Continental level and MS EW-TWGs	Contingent on supported by Continental level and MS EW-TWGs	AUC / IDOC	Indicators	Budget (Estimation \$US)	Responsible Party	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
								X				
Guidance and protocols on hazard, vulnerability, and risk assessment.	Actions to be undertaken Develop specifications for a common shared Disaster Management Information System (DMIS) consisting of a web-GIS platform, with an accessible database to enable different user profiles (forecasters, disaster managers,	Specification for System developed and agreed by key Stakeholders.	Indicators	Budget (Estimation \$US)	Responsible Party	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
								X				

	Decision Makers) to access information in real-time.																						
Activity 9 Support Training and Capacity Building	Procurement and roll out of the common DMIS, including training for users on its operation and maintenance.	DMIS operational at Continental, REC and MS levels.																	X	X	X	Year 7	
	Actions to be undertaken	Indicators	Budget (Estimation \$US)	Responsible Party	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7												
	Undertake MHEWS training need analysis at IGAD and MS levels, propose solutions to address any gaps identified.	Gap analysis report and proposals for training and capacity building at IGAD and MS levels.		IDOC supported by MS EW-TWGs		X	X													X			
	Delivery of Training and Capacity Building Plans at IGAD and MS levels	Training and Capacity building delivered in line with agreed schedule.		IDOC supported by MS EW-TWGs															X				
Activity 10 Create Protocols for Exchange of Warnings	Actions to be undertaken	Indicators	Budget (Estimation \$US)	Responsible Party	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7												
	Develop protocols for the exchange of warnings at, and between, REC and MS levels.	Protocols developed and agreed by AUC, IGAD and MSs.		IGAD and MSs supported by EW-TWGs.		X																	
	Training on protocols delivered and systems tested before going live.	Protocols for the exchange of warnings goes live.		IGAD and MSs supported by EW-TWGs.			X																

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Activity 11 Establishing the IDOC	Actions to be undertaken							
	Finalise facilities and staffing plan, develop supporting protocols and SOPs.	X						
	Train staff, test facilities and systems, and operationalise structure.		X					
	Indicators							
	Final staffing and facilities plan							
	IDOC goes "live".							
	Budget (Estimation \$US)							
Activity 12 Capacity Building for Monitoring & Forecasting	Actions to be undertaken	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
	Technical assistance at IGAD and MS in identifying gaps and putting in place costed development plans.			X	X			
	Sharing of good practices and encouragement for proposals for joint capacity building initiatives and partnership funding Programs.	X	X	X	X	X	X	X
	Indicators							
	Gap analysis and capacity building plans developed at IGAD and MS levels.							
	Good practices identified and shared by EW-TWG network, opportunities for partnership working or delivery of efficiencies identified and taken.							
	Budget (Estimation \$US)							
	No cost – ongoing work of EW-TWGs is expected to deliver cashable savings over time.							
Activity 13 Training of Monitoring & Forecasting Practitioners	Actions to be undertaken	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
	Undertake training gap analysis for sectoral Monitoring			X				
	Gap analysis report with recommendations for action at							
	Indicators							
	Gap analysis report with recommendations for action at			X				
	Budget (Estimations)							
	IDOC supported by EW-TWGs and							

		Continental, REC and MS levels.		International Bodies, such as WMO.		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Activity 14 Evaluation & Testing of Warning Dissemination	& Forecasting Practitioners.	Training delivered at IGAD and MS levels.	To be defined by gap analysis,	IGAD, MSs, International Partners.	X				X	X	X	
	Training delivery to address identified gaps.	Indicators	Budget (Estimation \$US)	Responsible Party								
	Evaluation & Testing of Warning Dissemination at IGAD and MS levels.	Report setting out findings of evaluation and making costed recommendations for improvement as required.		IGAD DOC and MS EW-TWGs						X		
	Delivery of recommended changes to warning dissemination and communication.	Recommendations from evaluation addressed.	To be defined in the evaluation report.	IGAD DOC, MSs						X		
Activity 15 Establish Warning Dissemination Guidelines and SOPs	Actions to be undertaken	Indicators	Budget (Estimations \$US)	Responsible Party	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
	EW-TWGs at IGAD and MS levels develop draft guidelines and SOPs.	Draft warning dissemination guidelines and SOPs developed and agreed by EW-TWG.		EW-TWG at IGAD and MS levels.		X						
	Guidelines and SOPs adopted by relevant organisations, including sensitisation and training of operators.	Guidelines and SOPs operationalized.		Responsible MDAs at IGAD and MS levels.			X					

					Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Activity 16 Adoption of Common Alerting Protocols (CAP)	Actions to be undertaken	SOPs and guidance documents on warning dissemination and communication revised to adopt CAP.	Indicators	Guidelines and SOPs revised.							
		Revised documents agreed by relevant MDAs.		Revised documents adopted by all relevant MDAs.		X					
Activity 17 Deployment of New Telecom Technologies	Actions to be undertaken	Identification of telecom technologies that may assist in effective warning dissemination and communication.	Indicators	Continental level Report proposing suitable ICT that may assist in effective warning dissemination and communication, along with a costed program for their deployment.				X			
		Roll out of recommendations from telecom review.		Recommendations in the report are addressed.					X	X	X
Activity 18 Prepare Multi-Hazard Early Action Plans	Actions to be undertaken	Develop common protocols, templates, and training to support	Indicators	Common protocols, templates and			X				
				assisted by IDOC							

	preparation of Multi-Hazard Early Action Plans.	training materials produced.		Regional and MS levels	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
	Training and capacity building delivered for representatives from relevant MDAs to enable them to produce plans using the common protocols and templates.	Training delivered for delegates at IGAD and MS levels, enabling them to deliver improved and standardised plans.		IDOC assisted by EW-TWG at Regional and MS levels			X				
Activity 19 Develop Risk Sensitisation and Training Materials	Actions to be undertaken Develop a set of risk sensitisation materials for common hazards aimed at decision makers, responders, and communities.	Indicators Materials developed and agreed by Stakeholders.	Budget (Estimation \$US)	Responsible Party IDOC assisted by EW-TWG at Regional and MS levels	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
	Develop an Annual Program of risk sensitisation for IGAD and MS levels, including reaching the last mile.	Annual Program for risk sensitisation established and delivered at IGAD and MS levels.		IDOC assisted by EW-TWG at Regional and MS levels		X	X	X	X	X	X
Activity 20 Develop Training for Responders on MHEWS Early Action	Actions to be undertaken Develop a set of training materials on early action for responders	Indicators Materials developed and agreed by stakeholders.	Budget (Estimations \$US)	Responsible Party IDOC assisted by EW-TWG at Regional and MS levels	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
						X					

Activity 21 Conduct Regular Simulations and Exercises	Actions to be undertaken	Indicators	Budget (Estimations \$US)	Responsible Party	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
	Deliver "Train the Trainer" Program for IGAD and MS level personnel.	Trainers on early action are trained at IGAD and MS level.		IDOC assisted by EW-TWG at Regional and MS levels			X	X	X	X	X
	Deliver localised training at IGAD and MS levels.	Training cascaded at IGAD and MS levels.		IDOC assisted by EW-TWG at Regional and MS levels			X	X	X	X	X
	Develop guidance and standardised materials for MHEWS simulations and exercises.	Guidance produced and agreed with stakeholders.		IDOC assisted by EW-TWG at Regional and MS levels.			X				
	Undertake at least one annual simulation or exercise at IGAD and National levels.	Annual simulations and exercises delivered at IGAD and National levels.		IDOC assisted by EW-TWG at Regional and MS levels				X	X	X	X

Annex 2 – Binding and non-binding instruments creating the conditions for a functioning continental MHEW and Early Action system

The IGAD MHEWS Institutional Framework has been anchored on legislative, policy or framework structures and institutional arrangements presented in the preamble of the document and is consistent with the AUC's Africa Institutional and Operational Framework for Multi-hazard Early Warning and Early Action. The guidance below is copied from that Continental Framework and is intended to guide IGAD and National MHEWS specialists on the range of binding and non-binding instruments that may be adopted to create the conditions for a functioning IGAD MHEW and Early Action system

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, including decisions made by IGAD to establish the IDOC.

The establishment of an effective early warning system has been a goal of the African Union 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 Executive Council 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”.

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 subsidiarity and 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 of the continental level shouldn't transgress the objectives of the AU.

The Assembly of the Union, having regard in particular Article 8 to the Constitutive Act of the African Union, 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 MHEW and EA system:

- 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 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 MHEWS at Continental, Regional and Member State 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 in form of proposals, on the previously outlined four components of the early warning, 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 specialized offices of the African Union, 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 4 components of the MHEW system were depending 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 MHEW and EA system.

Instruments creating the conditions for a functioning Continental and IGAD MHEW and Early Action system

MHEWS COMPONENT	Action	African Union - AU	Regional Economic Community - REC	Member States - MS ¹
Disaster risk knowledge	Multi-hazard risk assessment (hazard, vulnerability, exposure, coping capacity) and mapping for disaster management	AU 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	AU 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	AU 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	AU 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	AU 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	AU directive on the establishment of the AU MHEWS training centre of excellence using academic curricula and programs for training of personnel of all relevant stakeholders of the MHEWS supporting MS academic institutions and research centres	REC directive on the contribution and support of the AU MHEWS training centre of excellence	MS legislation stating the contribution and support of the AU MHEWS training centre of excellence

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

<p>Detection, monitoring, analysis and forecasting of the hazards and possible consequences</p>	<p>Open source MHEWS data platform</p>	<p>AU directive on the establishment of the continental MHEWS situation room run open data MHEWS 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 MHEWS services in support of the protection of life and property and the well-being of all AU nations</p>	<p>REC directive to the contribution of the continental MHEWS situation room run open data MHEWS platform</p>	<p>MS DRM law provisions of the EOC contribution and support to the continental MHEWS situation room run open data MHEWS platform</p>
	<p>Financing mechanism</p>	<p>AU directive on the MHEWS financing mechanism to support the created infrastructure</p>	<p>REC directive on the MHEWS financing mechanism to support the created infrastructure</p>	<p>MS DRM government decision on the financing mechanism to support the created infrastructure</p>
	<p>Detection, monitoring and forecasting data exchange</p>	<p>AU directive on the establishment of the continental MHEWS situation room able to gather timely MHEWS 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</p>	<p>REC directive on the establishment of MHEWS situation room able to gather and exchange timely MHEWS information to issue alerts to support decisions to be made by the REC organs and MS</p>	<p>MS DRM law provisions that define that the National DRM Agency or EOC receives and integrates all relevant MHEWS 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.</p>
		<p>AU recommendation on the management structure and qualification of staff of the: continental MHEWS situation room, REC MHEWS situation room, national EOC, NHMS, DRM institutions etc.</p>	<p>REC recommendations on the management structure and qualification of staff of the: REC MHEWS situation room, national EOC, NHMS, DRM institutions etc.</p>	<p>Incorporation of the recommendations on the management structure and qualification of staff into domestic legislation by decision of the government on the qualifications of staff of all MHEWS relevant institutions</p>

Warning dissemination and communication		<p>AU recommendation on the optimal hazard monitoring observation and monitoring network design and technical equipment</p> <p>AU recommendations on development of operational hydrological modelling for flood and flash flood forecasting systems and impact-based forecasts</p> <p>AU recommendations on systematic and real-time data and information sharing among different institutions and transboundary exchange by using web-GIS platforms</p>	<p>REC recommendation on the optimal hazard monitoring observation and monitoring network design and technical equipment</p> <p>REC specific recommendations on development of operational hydrological modelling for flood and flash flood forecasting systems and impact-based forecasts</p> <p>REC specific recommendations on systematic and real-time data and information sharing among different institutions and transboundary exchange by using web-GIS platforms</p>	<p>Incorporation of the recommendations on the optimal hazard monitoring observation and monitoring network design and technical equipment into government concepts and decisions</p> <p>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</p> <p>Incorporation of the recommendations on systematic and real-time data and information sharing among different institutions and transboundary exchange by using web-GIS platforms into NMHS and DRM laws and multilateral agreements</p>
	<p>Warning dissemination and communication</p>	<p>AU regulation that warning information should be delivered from a single platform - the MHEWS situation room run open data MHEWS platform that uses the warning dissemination means, ways, four-color system and symbols consistent across all stakeholders responsible for warning dissemination and communication</p>	<p>REC decision that weather- and climate-related warning information should be delivered from a single platform - the MHEWS situation room run open data MHEWS platform that uses the warning dissemination means, ways, four-color system and symbols consistent across all stakeholders responsible for warning dissemination and communication</p>	<p>MIS DRM law containing the provision that weather- and climate-related warning information should be delivered from a single platform - the MHEWS situation room run open data MHEWS platform that uses the warning dissemination means, ways, four-color system and symbols consistent across all stakeholders responsible for warning dissemination and communication.</p>
	<p>Warning dissemination and communication</p>	<p>AU 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, women and men,</p>	<p>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</p>	<p>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</p>

Preparedness and response capabilities	Preparedness-contingency plans	AU preparedness-contingency plans development recommendations	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)	needs of specific groups - urban and rural, women and men, 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.	different needs of specific groups - urban and rural, women and men, 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.
	Public awareness campaigns	AU recommendations on the continuous continental MHEW and EA system campaign with the aim to educate disaster risk management services, people, media, vulnerable groups, school children etc.	REC specific preparedness-contingency plans development recommendations	MS Disaster management legislation stipulating the methodology on preparedness-contingency plans development based on the AU recommendations	MS specific recommendations on the continuous continental MHEW and EA system campaign with the aim to educate disaster risk management services, people, media, vulnerable groups, school children



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Multi-Hazard Early Warning and Early Action