



Early
Warnings
for All

TANZANIA EARLY WARNINGS FOR ALL

IMPLEMENTATION ROADMAP 2026-2030



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FOREWORD

Climate change and natural hazards continue to pose significant risks to the well-being and development of our nation. Recently, the country has experienced natural hazards and impacts of climate change and variability, which include landslides, earthquake, frequent severe floods and prolonged droughts, sea level rise, declining crop yields, increased incidences of crop pests and diseases, loss of livestock, decreased water availability as well as increase of vector and water-borne diseases. Recurrence of these climate hazards has posed risks to development and have negative impacts on economy, environment, infrastructure, health and livelihoods.

Responding to these challenges, Tanzania has made important steps in strengthening early warning systems and disaster management such as investments in early warning infrastructure, capacity of experts, establishment of institutional legal and policy frameworks regarding early warning, yet challenges remain particularly in reaching communities and sectors at risk with timely and reliable warnings. It is in this context that we proudly present the Tanzania Early Warnings for All (EW4All) National Implementation Roadmap (2026-2030). This roadmap marks a pivotal moment in our national efforts to enhance resilience and reduce disaster risks through robust, people-centered and inclusive early warning systems.

On behalf of the Government of the United Republic of Tanzania, I commend all stakeholders who contributed to this milestone document. Thus, let us move forward with a strong partnership to implement the roadmap and achieve the ambition of universal early warning coverage for all Tanzanians by 2030.



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PREFACE

The Early Warnings for All (EW4All) initiative is a global call to action led by the United Nations Secretary-General, aiming to ensure that every person on Earth is protected by life-saving early warning systems by 2030. In alignment with this vision, the United Republic of Tanzania has developed this comprehensive Tanzania Early Warnings for All (EW4All) National Implementation Roadmap (2026-2030) to scale up and enhance its multi-hazard early warning systems.

This roadmap reflects our national commitment to build a resilient community and sectors towards the impacts of climate and other natural hazards where no one is left behind. It offers a strategic path forward, grounded in scientific evidence, community needs, and national priorities, while aligning with national, regional and global frameworks.

The development of this roadmap is anchored in key policy and legal frameworks, including Disaster Management Policy of 2004 (2025 Edition), the Tanzania Meteorological Authority Act No. 2 of 2019, the Disaster Management Act No. 6 of 2022, the Third Five-Year Development Plan (FYDP III) 2021/22-2025/26, the National Climate Change Strategy (2021-2026), National Disaster Management Strategy (2022-2027), the National Adaptation Plan (NAP) 2021 and Tanzania Development Vision 2050.

Through an inclusive and consultative process, this roadmap was developed in collaboration with government institutions, ministries, development partners, UN agencies, private sectors, civil society, academia, and community representatives. The process included a gap analysis using a standardized global checklist, stakeholder consultations, and validation workshops.

The roadmap lays out clear gaps in implementation of early warning and proposes a set of interventions across the four pillars of the early warning system namely disaster risk knowledge; detection, monitoring, and forecasting; dissemination and communication; and preparedness and response. It also addresses cross-cutting issues such as governance, stakeholder coordination, financing and advocacy.

As we implement this roadmap, we envision a future where Tanzanians, including the most vulnerable, receive timely, accurate, and actionable early warnings that empower them to make informed decisions, reduce risks, and enhance resilience to disasters.

ACKNOWLEDGEMENT

Development of the EW4All implementation Roadmap 2026-2030 has solicited the assistance, participation and cooperation of various key stakeholders and experts from public and private sector and international community. The process involved a multi-disciplinary and multi stakeholder's national expert team from relevant ministries, departments and institutions under the coordination of the TMA. I would like to acknowledge their efforts and valuable technical support in preparing this Roadmap.

I take this opportunity to thank all the government ministries, departments and agencies, UN agencies, international and multilateral organizations, local government authorities, research and academic institutions, private sector, non-governmental organizations, civil societies and other institutions for participating in the development of this Roadmap. I express gratitude to the National Technical Committee for disaster management for overseeing the preparation of this roadmap.

Special thanks go to the Ministry of Foreign affairs of Denmark, United Nation Development Programme (UNDP) Tanzania for the financial support in the development of the roadmap. I also commend the efforts of the Global Pillar Lead, the World Meteorological Organization (WMO), the United Nations Office for Disaster Risk Reduction (UNDRR), the International Telecommunication Union (ITU), and the International Federation of Red Cross and Red Crescent Societies (IFRC) for their global coordination, tools and technical frameworks that informed this process.

I recognize the tireless efforts of the national team of experts that includes experts from PMO-DMD, TMA, TCRA and TRCS for their technical and valuable inputs in the development of this Roadmap. Finally, I believe the spirit of teamwork with multidisciplinary and multi-stakeholder involvement in development of this roadmap will continue in its implementation thus contributing to the climate resilient community.

ACRONYM

Acronym		Full Form
AI	-	Artificial Intelligence
CAP	-	Common Alerting Protocol
CDMS	-	Climate Data Management System
CREWS	-	Climate Risk and Early Warning Systems Initiative
DMD	-	Disaster Management Department
DRM	-	Disaster Risk Management
DRR	-	Disaster Risk Reduction
EOC	-	Emergency Operation Center
EPRP	-	Emergency Preparedness and Response Plan
ERT	-	Emergency Response Team
EWEA	-	Early Warning and Early Action
EWS	-	Early Warning System
EW4All	-	Early Warnings for All
FYDP III	-	Third Five-Year Development Plan 2021/22–2025/26
GST	-	Geological Survey of Tanzania
ICT	-	Information and Communication Technology
IFRC	-	International Federation of Red Cross and Red Crescent Societies
IoT	-	Internet of Things
ITU	-	International Telecommunication Union
LCU	-	Local Currency Unit
MDAs	-	Ministries, Departments, and Agencies
MCIT	-	Ministry of Communication and Information Technology
MHEWS	-	Multi-Hazard Early Warning Systems
ML	-	Machine Learning
MoW	-	Ministry of Water
NETP	-	National Emergency Telecommunication Plan
NDMTC	-	National Disaster Management Technical Committee
NAP	-	National Adaptation Plan
NGO	-	Non-Governmental Organization
PGI	-	Protection, Gender, and Inclusion
PMO	-	Prime Minister's Office
PMO-RALG	-	President's Office– Regional Administration and Local Government
QMS	-	Quality Management System
RVCA	-	Risk and Vulnerability Capacity Assessment
SMS	-	Short Message Service
SOFF	-	Systematic Observations Financing Facility
SOPs	-	Standard Operating Procedures
TCRA	-	Tanzania Communications Regulatory Authority
TMA	-	Tanzania Meteorological Authority
TOR	-	Terms of Reference
TRCS	-	Tanzania Red Cross Society
UN	-	United Nations

UNDP	-	United Nations Development Programme
UNDRR	-	United Nations Office for Disaster Risk Reduction
URT	-	United Republic of Tanzania
WFP	-	World Food Programme
WIS 2.0	-	WMO Information System 2.0
WMO	-	World Meteorological Organization



01

BACKGROUND

Tanzania's diverse geography, climate variability, and growing exposure to extreme weather events linked to climate change have made disaster preparedness and early action a national priority. In recent decades, the country has faced repeated climate-related hazards, from prolonged droughts and seasonal floods to destructive tropical storms and rising temperatures, all of which disrupt livelihoods, damage infrastructure, and slow socio-economic progress. These realities highlight the importance of establishing an early warning system that not only issues timely alerts but also ensures that communities, especially those most at risk, are able to act effectively.

Early Warning Systems (EWS) form the backbone of disaster risk reduction and climate adaptation strategies, enabling communities and institutions to anticipate hazards, prepare responses, and reduce potential impacts before they escalate into disasters, hence primarily support in saving lives and reducing economic losses from disasters. To be effective, EWS must combine scientific and technological capabilities with local knowledge, ensure that vulnerable populations are prioritized, and deliver clear and actionable messages. This comprehensive approach considers both environmental and social factors, integrates short-term alerts with long-term resilience planning, and ensures community ownership of the process.

Globally, the concept of early warning systems is framed around four mutually reinforcing pillars:

- i. **Disaster risk knowledge** – systematically collect risk data and undertake risk assessments on hazards and vulnerabilities to improve risk understanding.
- ii. **Detection, Observation, monitoring, analysis, and forecasting** – develop hazard monitoring and early warning services.
- iii. **Warning dissemination and communication** – communicate risk information so it reaches all those who need it, and is understandable and usable.
- iv. **Preparedness and response capabilities** – build national and community response capabilities.

Strong EWS performance relies on well-coordinated multi-sectoral action, clear institutional mandates, robust legal frameworks, active community engagement, and sustained investment in capacity and infrastructure. Building on this foundation, Tanzania is advancing its participation in the Early Warnings for All (EW4All) initiative, a special programme of the UN Secretary-General that seeks to ensure every person on Earth is protected by early warning systems by 2030. As part of this global effort, the United Republic of Tanzania is committed to scaling up existing initiatives and expanding national EWS coverage in recognition of the country's high vulnerability to climate-related hazards such as floods, droughts, tropical storms and rising temperatures. These hazards continue to threaten lives, livelihoods, infrastructure, and economic stability, prompting the government to strengthen its disaster risk management and invest in more inclusive, technology-driven early warning systems, supported by a solid policy and institutional foundation. The country's regulatory foundation for EWS is grounded in the National Disaster Management Policy of 2004 (2025 Edition), TMA Act No. 2 of 2019 and the Disaster Management Act No. 6 of 2022.

These legal instruments provide strategic direction for DRM efforts, emphasizing the importance of early warning technologies, traditional knowledge integration, and community access to standardized warnings.

Early warning system implementation is spearheaded by key national institutions. Firstly, the Prime Minister's Office– Disaster Management Department (PMO-DMD), which coordinates disaster risk management supported by data inputs from institutions such as TMA for weather and climate data, the Geological Survey of Tanzania (GST) for seismic and landslide risks, and the Ministry of Water for hydrological threats. However, gaps remain such as limited capacity of the centralized database, absence of national and local open access platforms for sharing risk information and absence of harmonized Standard Operating Procedures (SOPs) among early warning institutions.

Secondly, the Tanzania Meteorological Authority (TMA) plays a pivotal role in observation, forecasting, and warning issuance. Despite significant achievements, including successful forecasting capabilities for climate and weather events, TMA continues to face constraints such as insufficient observational networks, insufficient modern infrastructure and limited capacity for packaging and disseminating user-friendly forecasts.

Thirdly, the Tanzania Communications Regulatory Authority (TCRA) coordinates efforts to integrate information and communication channels into EWS. The National Emergency Telecommunication Plan (NETP) reflects Tanzania's commitment to enhance warning dissemination and communication. Nonetheless, challenges persist, especially in last-mile communication and ensuring message comprehension by diverse and vulnerable groups.

Fourthly, the Tanzania Red Cross Society (TRCS) plays a central role in advancing community-based preparedness and implementing Anticipatory Action (AA) to ensure early warnings lead to timely and effective responses. Working with Government institutions, technical partners, and communities, TRCS supports planning, coordination, and resilience building at all levels. Nonetheless, critical gaps remain, including weak harmonization of AA and preparedness plans, absence of a national AA framework, outdated Early Warning systems, limited awareness across institutions and communities, insufficient local response and logistics capacity, and poor integration of DRR and Early Warning into community practices.

Tanzania's participation in the EW4All initiative and the development of the roadmap reflect strong national commitment to ensure that every citizen, especially the most vulnerable, is protected by timely, actionable early warnings. This roadmap is expected to serve as a strategic tool to mobilize resources, guide multi-sectoral action, and strengthen national resilience against future climate-related disasters. By outlining clear priorities, defined responsibilities, and targeted investments, the roadmap will bridge existing gaps in Tanzania's early warning capacity and provide a coherent framework for translating policy commitments into measurable improvements in disaster preparedness and response.



02

PURPOSE & OBJECTIVES

The main purpose of the Tanzania EWS Roadmap is to strengthen and sustain a people-centred, multi-hazard early warning system that ensures timely, reliable, and actionable information reaches all communities in the United Republic of Tanzania, thereby safeguarding lives, livelihoods, property and national development gains.

To achieve this purpose, the Roadmap sets out clear objectives as follows:

1. **To strengthen disaster preparedness and response** by building community awareness and response capacity and development of emergence plan and framework.
2. **To improve the provision of early warning information** through investment in advanced observational networks and modern forecasting facilities, application of emerging technologies and enhancing the capacity of TMA in developing, packaging and communicating early warning information
3. **To enhance the dissemination of warnings information** by using multiple communication channels to ensure timely and accessible information reaches all communities.
4. **To strengthen disaster risk knowledge** by enhancing community awareness, updating multi-hazard risk profiles, Development of Disaster Management Information platform and databases on exposure and vulnerabilities.W
5. **Support policy alignment and resource mobilization** for sustainable early warning services.

Importantly, the roadmap aligns with the Disaster Management Policy of 2004 (2025 Edition) which calls for stronger early warning systems, the Tanzania Meteorological Authority Act No. 2 of 2019, which mandates it with the responsibility to provide, regulate, and coordinate meteorological services in Tanzania. It also supports the implementation of the Disaster Management Act No. 6 of 2022, which mandates coordination of early warning information among early warning institutions. It also aligns with the Tanzania Development Vision 2050, the Tanzania National Framework for Climate Services (2020–2025), and the Third Five-Year Development Plan (FYDP III) 2021/22–2025/26, all of which emphasize improved climate information and early warning systems as essential for safeguarding livelihoods and promoting sustainable development. Furthermore, the roadmap is consistent with the National Climate Change Strategy (2021–2026) and the National Adaptation Plan (NAP) 2021, both of which prioritize the development and scaling up of multi-hazard early warning systems to build resilience across key sectors.

Regionally, the roadmap reflects Tanzania's commitment to the African Union's Programme of Action for the Implementation of the Sendai Framework (2015-2030). Through these linkages, the roadmap ensures a harmonized and strategic approach to early warning investments, one that enhances Tanzania's preparedness and response capacities, promotes institutional coordination, and strengthens resilience at national, regional, and community levels.

Overall, the Roadmap stands as a unifying platform for national and local institutions to work collaboratively toward a shared vision of comprehensive, multi-hazard early warning coverage in Tanzania. It translates policy commitments into actionable steps, ensures that investments are strategically directed, and strengthens linkages across all levels of governance.

By fostering coordinated programming, optimizing resource allocation, and enhancing technical and institutional capacities, the Roadmap lays the foundation for an early warning system that is inclusive, reliable, and capable of safeguarding lives, livelihoods, and national development gains.



03

METHODOLOGY & GUIDING PRINCIPLES

Strengthening Tanzania's Early Warning System requires a roadmap that is not only technically sound but also shaped by the Nation's priorities, and capacities. The development of the TANZANIA EW4ALL ROADMAP (2026–2030) was therefore undertaken through a process that was participatory, inclusive, and firmly rooted in evidence. This ensured that the final roadmap reflects both global best practices and Tanzania's institutional, social, and environmental contexts.

3.1 Methodology

Development of the roadmap followed a multi-phase methodology that combined rigorous technical assessment with broad-based stakeholder engagement. It began with a comprehensive national gap analysis to assess the status of the multi-hazard early warning system in Tanzania. This analysis examined institutional arrangements, operational capacities, technological infrastructure, communication channels, and community engagement practices. The assessment applied the Minimum Core Capability Checklist developed under the EW4All initiative, enabling systematic identification of strengths, gaps, and priority areas for improvement.

Building on these findings, technical consultations were conducted with pillar leads representing each of the four EW4All pillars namely, Disaster Risk Knowledge; Detection, Monitoring, Analysis, and Forecasting; Warning Dissemination and Communication; and Preparedness and Response Capabilities. These engagements provided in-depth technical insights and facilitated the refinement of recommendations to ensure they were context-specific, feasible, and responsive to Tanzania's operational realities.

In March 2025, the process advanced to a national multi-stakeholder workshop that brought together a diverse range of actors, including the Global and National pillar leads, local government authorities, key line ministries, academia, civil society, the private sector, UN agencies and development partners. During the workshop participants worked in technical groups to review the identified gaps, discussed proposed actions and recommended actions to be addressed in the roadmap.

Following the workshop, the expert team convened for a series of structured review meetings. These sessions incorporated cross-sectoral perspectives, ensured consistency with national laws and policies and addressed practical considerations for implementation, governance, and financing.

The final draft was submitted to the National Technical Committee for Disaster Management for endorsement. The endorsement of the roadmap signified national consensus on the Roadmap's objectives, strategic priorities, and operational framework, paving the way for coordinated implementation.

Through this inclusive and iterative process, the Roadmap has emerged as a technically sound, nationally owned, and actionable framework that defines clear priorities, assigns responsibilities, and sets measurable targets to strengthen early warning systems from the national to the community level.

3.2 Guiding Principles

Implementation of the TANZANIA EW4ALL ROADMAP will be anchored in the following principles, ensuring that all actions are equitable, sustainable, and impactful:

- i. **National Ownership and Institutional Commitment:** Grounded in existing mandates such as Disaster Management Policy of 2004 (2025 Edition), the Disaster Management Act No. 6 of 2022 and the TMA Act No. 2 of 2019, the Roadmap reinforces the leadership of the Government of Tanzania in building, coordinating, and sustaining effective early warning systems.
- ii. **Inclusiveness and Multi-Stakeholder Collaboration:** Promoting a whole-of-society approach, the Roadmap encourages active engagement from national and local governments, communities, NGOs, academia, the private sector, media, and development partners to foster shared responsibility and collective action.
- iii. **Gender and Disability Responsiveness:** Special measures will be taken to ensure that early warning messages are accessible, relevant, and actionable for women, men, persons with disabilities, older persons, and other vulnerable groups.
- iv. **Child and Youth Sensitivity:** Recognizing the role of young people in fostering a culture of preparedness, the Roadmap promotes age-appropriate awareness activities, school-based preparedness programs, and youth-led community initiatives.
- v. **Evidence-Based and Risk-Informed Decision-Making:** Actions will be guided by scientific data, hazard and risk assessments, and indigenous knowledge, ensuring that warnings are timely, accurate, and actionable.
- vi. **Sustainability and Innovation:** The Roadmap emphasizes strengthening local capacities, institutionalizing best practices, and leveraging emerging technologies such as AI, mobile-based alert systems, and geospatial mapping to enhance system efficiency and reach.



04

NATIONAL IMPLEMENTATION ROADMAP TOWARDS SCALING UP EARLY WARNING SYSTEMS

TANZANIA EW4ALL IMPLEMENTATION ROADMAP provides a structured framework for addressing the critical gaps identified across the four EW4All pillars. Each pillar is presented with a detailed analysis of existing challenges and proposed interventions, followed by a comprehensive implementation plan. These activities are linked to specific institutions responsible for implementation, ensuring accountability and alignment with national mandates. Furthermore, the roadmap assigns realistic timelines to guide sequencing and prioritization of interventions.

Importantly, the roadmap integrates the budgetary needs for each activity and pillar, thereby providing a transparent basis for resource mobilization. This approach ensures that implementation planning is not only technically sound but also financially viable, bridging the gap between strategy and action. By specifying cost estimates alongside activities, the roadmap enables government institutions, development partners, and other stakeholders to target their investments effectively and to coordinate contributions towards universal early warning coverage.

Table 1. The indicative financial requirements for scaling up early warning systems in Tanzania

Pillar	Focus Areas/Key Outcomes/ Interventions	Estimated Budget (USD)
Pillar 1 – Disaster Risk Knowledge	Enhanced disaster risk knowledge through hazard mapping, vulnerability assessments, training, and improved risk information tools.	1,815,000
Pillar 2 – Observation, Monitoring & Forecasting	Strengthened observation and forecasting capacity by expanding networks, adopting advanced early warning technologies, and integrating data platforms.	5,340,000
Pillar 3–Dissemination & Communication	Improved accessibility and reliability of early warning messages through upgraded communication infrastructure, multi-channel dissemination, and adoption of the Common Alerting Protocol (CAP).	60,000
Pillar 4 –Preparedness & Response	Enhanced community resilience through preparedness planning, simulation exercises, and strengthened local capacity for early response.	1,802,000
Inter-Pillar Governance, Coordination, Advocacy, M&E, and Financing	Strengthened governance and coordination of early warning systems through aligned policies, functional EPRPs and DRR strategies, operational EOCs and ERTs, standardized SOPs, capacity-building, sustainable resource mobilization, and a robust M&E framework.	1,330,000
Total		10,347,000

Table 2. Pillar 1 - Disaster Risk Knowledge

PILLAR 1: DISASTER RISK KNOWLEDGE												
Gap Identified	Associated Output	Output indicator	Activities	Responsibility		Implementation Timeline					Budget, USD / LCU	Budget Source
				Lead	Support	Year 1	Year 2	Year 3	Year 4	Year 5		
Gap 1.1 Inadequate inclusion of hazards in Tanzania Risk Profile for floods and drought of 2019	Output 1.1 Reviewed and Updated Tanzania Risk Profile for floods and drought of 2019	Number of hazards included in Tanzania Risk Profile document	Activity 1.1.1 Review and update the Tanzania Risk Profile for floods and drought of 2019	PMO	MDAs, PMO-RALG, TMA, NBS, DPs, UN agencies, Academic and Research institutions	X	X	X	X	X	250,000	Government of Tanzania, Development Partners, UN Agencies, NGOs

		Number of workshops and stakeholders reached	Activity 1.1.2 Conduct two (2) stakeholder workshop for advocacy and Dissemination	PMO	MDAs, NGOs, DPs, Academic and Research institutions	X		X		X	70,000	Government of Tanzania, Development Partners, UN Agencies
Gap 1.2 Absence of databases on exposure and vulnerability factors on different sectors	Output1.2 Vulnerability and exposed database in place	Assessment report	Activity 1.2.1 Conduct the assessment on vulnerability & exposure from different stakeholders	PMO	PMO, PMO-RALG, MDAs, eGA, NBS, TMA, MoF	X	X	X	X	X	30,000	Government of Tanzania, Development Partners, UN Agencies
		Vulnerability Database developed	Activity 1.2.2 Development of Exposure and Vulnerability database.	PMO	PMO, PMO-RALG, MDAs, eGA, NBS, TMA, MoF	X	X	X	X	X	55,000	Government of Tanzania, Development Partners, UN Agencies
		Number of trained staff	Activity 1.2.3 Capacity building in database management	PMO	PMO, PMO-RALG, MDAs, eGA, NBS, TMA, MoF	X	X	X	X	X	50,000	Government of Tanzania, Development Partners UN Agencies

Gap 1.3 Absence of open-access National Disaster information platform .	Output 1.3 Disaster Management Information System for storing, access and share risk Information developed	DMIS prototype	Activity 1.3.1 Develop DMIS System	PMO	eGA, MDAs	X		X		X	150,000	Government of Tanzania, Development Partners, UN Agencies, NGOs
		Number of users engaged	Activity 1.3.2 Conduct User Acceptance Test	PMO	MDAs, eGA		X				50,000	Government of Tanzania, Development Partners, UN Agencies
		DMS in place	Activity 1.3.3 System deployment and user training	PMO	MDAs, eGA, RS, LGAs		X	X	X	X	150,000	Government of Tanzania, Development Partners, UN Agencies
Gap 1.4 Absence of Maps showing Evacuation center and routes in 26 regions.	Output 1.4 Evacuation Centers and routes are clearly mapped.	Number of Evacuation Centers and routes identified.	Activity 1.4.1 Conduct assessment to identify evacuation areas and routes	PMO	PMO-RALG, RS, LGAs, NBS, Ministry of Lands	X		X		X	520,000	Government of Tanzania, Development Partners, UN Agencies, NGOs

	Evacuation areas and safe routes mapped	Activity 1.4.2 Develop digital map on evacuation areas and safe routes	PMO	MDAs, eGA, NBS, Ministry of Lands,	X		X		X	100,000	Government of Tanzania, Development Partners, UN Agencies, NGOs
	Number of awareness sessions and training conducted	Activity 1.4.3 Conduct awareness sessions to Disaster Management committees, communities and training to the first responders on the existence and utilization of evacuation areas and routes	PMO	PMO-RALG, RS, LGAs, Non-Government actors		X	X	X	X	390,000	Government of Tanzania, Development Partners, UN Agencies, NGOs

Table 3. Pillar 2 - Detection, Observation, Monitoring, Analysis and Forecasting of hazards

PILLAR 2: DETECTION, OBSERVATION, MONITORING, ANALYSIS AND FORECASTING												
Gap Identified	Associated Output	Output indicator	Activities	Responsibility		Implementation Timeline					Budget , USD / LCU	Budget Source
				Lead	Support	Year 1	Year 2	Year 3	Year 4	Year 5		
Gap 2.1 Insufficient observational and monitoring capacity.	Output 2.1 10 AWS, 20 Automatic Rainfall Stations, 5 A gromet Stations, 10 Marine Buoys and 4 AWOS procured, installed and calibrated.	Number of weather stations procured and installed	Activity 2.1.1 Procurement, installation and calibration of weather of observation instruments (10 AWS, 20 Automatic Rainfall Stations, 5 A gromet Stations, 10 Marine Buoys and 4 AWOS)	TMA	WMO Development partners	x	x	x	x	x	4,000,000	Development partners, Government of URT

Gap 2.2 Inadequate uptake of emerging technology in Weather analysis and forecasting	Output 2.2.1 Enhanced national capacity in weather radar operationalization routine maintenance and calibration	Maintenance and calibration plan.	Activity 2.2.1.1 Develop and implement a routine maintenance and calibration plan.	TMA	Global and Regional Forecasting Centers	x		x		x	15,000	Development partners, Government of URT
		Number of staff trained	Activity 2.2.1.2 Train radar technicians/ engineers and users	TMA	Global and Regional Forecasting Centers		x		x		20,000	Development partners, Government of URT
	Output 2.2.2 Forecasts and weather/ climate products generated by AI, Machine Learning and Cloud-based technologies	Number of forecasts generated using AI, ML and cloud-based technologies.	Activity 2.2.2.1 Pilot AI/ML based forecasting using models using historical and real-time data.	TMA	Global and Regional Forecasting Centers	x	x	x	x	x	40,000	Development partners, Government of URT

			Activity 2.2.2.2 Develop and validate new weather and climate products generated using AI, ML and cloud-based technologies.	TMA	Global and Regional Forecasting Centers		x	x		x	40,000	Development partners, Government of URT
		Number of trained TMA experts	Activity 2.2.2.3 Train TMA experts in generating weather/ climate forecasts using AI, ML and Cloud-based technologies.	TMA	WMO Development partners		x		x		25,000	Development partners, Government of URT
	Output 2.2.3 Twinning and regional cooperation programs conducted to strengthen uptake of emerging forecasting technologies and provide technical	Number of twinning/exchange programs conducted	Activity 2.2.3.1 Identify and formalize partnerships with regional/global centers of excellence.	TMA	Beneficiary countries, WMO	x	x	x	x	x	30,000	Development partners, Government of URT

	support to other countries.											
		Number of joint training, and mentorship programs	Activity 2.2.3.2 Conduct exchange visits, joint training, and mentorship programs	TMA	WMO Development partners	x	x	x	x	x	150,000	Development partners, Government of URT
		Number of NMHS supported	Activity 2.2.3.3 Provide technical support and share knowledge with other NMHSs in the region.	TMA	WMO	x		x		x	100,000	Number of NMHSs in other countries supported

Gap 2.3 Insufficient capacity in packaging and dissemination of weather and climate information to end users in a timely manner.	Output 2.3.1 Common Alerting Protocol (CAP) platform integrated among key stakeholders for multi-hazard early warning dissemination	Number of stakeholders received awareness seminars	Activity 2.3.1 Organize awareness raising seminars to Stakeholders about CAP	TMA	WMO, Media, ITU, Communities,	x	x		x	x	40,000	Development partners, Government of URT
	Output 2.3.2 Improved capacity for packaging and dissemination of weather and climate information in simplified, localized and timely formats tailored to the needs of different user groups	Number of equipment and software procured.	Activity 2.3.2.1 Procurement of equipment and software for preparations and processing of weather and climate information	TMA	WMO, Media, CSOs, NGOs, Humanitarian Organizations (Tanzania Red Cross Society), Faith based Organizations, Schools, etc.	x		x	x	x	100,000	Development partners, Government of URT

	Number of community radio engaged.	Activity 2.3.2.2 Engage the community radios for dissemination of weather and climate to wider areas	TMA	WMO Development partners	x		x	x	x	20,000	Development partners, Government of URT
	Number of trained staff	Activity 2.3.2.3 Train the TMA staff in developing packing and communicating weather and climate information.	TMA	WMO Development partners		x	x		x	20,000	Development partners, Government of URT
	Categories/groups of stakeholders in co-production of weather and climate services	Activity 2.3.2.4 Engage broader participation of stakeholders in co-production of weather and climate information	TMA	WMO Development partners	x	x	x	x	x	200,000	Development partners, Government of URT

		Tailored products co-developed	Activity 2.3.2.5 Translate forecasts into simplified formats and language.	TMA	CANTZ, Development partners,	x	x	x	x	x	40,000	Development partners, Government of URT
Gap 2.4 Insufficient communication infrastructure to support automated data transmission	Output 2.4.1 Enhanced communication infrastructure for automated data transmission	Number of communication devices installed	Activity 2.4.1.1 Procure and install modern communication hardware and software (e.g server routers and modems, VSAT, GSM).	TMA	WMO, Communication authority	x	x	x	x	x	300,000	Development partners, Government of URT
	Output 2.4.2 Upgraded Climate Data Management System (CDMS) with additional backup functionalities and cyber threat features	Upgraded Climate data management system (CDMS) in place	Activity 2.4.2.1 Upgrade CDMS software and hardware	TMA	WMO	x	x	x	x	x	200,000	Development partners, Government of URT
		Number of trained staff	Train staff on CDMS operations									=

Table 4. Pillar 3 - Warning, Dissemination and Communication

PILLAR 3: WARNING DISSEMINATION AND COMMUNICATION												
Gap Identified	Associated Output	Output indicator	Activities	Responsibility		Implementation Timeline					Budget, USD / LCU	Budget Source
				Lead	Support	Year 1	Year 2	Year 3	Year 4	Year 5		
Gap 3.1 Tanzania is yet to ratify the Tampere Convention	Output 3.1 Tampere Convention ratified by Tanzania	Number of stakeholders engaged	Activity 3.1.1 Conduct awareness to key stakeholders on the importance of Tanzania ratifying the Tampere Convention.	TCRA	MCIT, PMO, Ministry of Foreign affairs and all relevant stakeholders	x	x		x	x	10,000	Government of URT.
		Tanzania ratify the Tampere Convention	Activity 3.1.2 Follow up the processes of ratifying the Tampere Convention.	MCIT	TCRA, PMO, Ministry of Foreign Affairs and All relevant Stakeholders		x	x	x		NIL	N/A

Gap 3.2 <i>Limited accessibility of early warning messages to end users in high- risk areas via mobile networks.</i>	Output 3.2 <i>Enhanced accessibility of early warning to end users through media such as community radios, SMS and social media</i>	<i>Number of training and awareness sessions</i>	Activity 3.2.1 <i>Coordinate training and awareness for key stakeholders to integrate and utilize information from the Common Alerting Protocol (CAP), ensuring accessibility of early warning information.</i>	<i>TMA</i>	<i>TCRA, ITU, GSMA, Mobile Network Operators, All relevant stakeholders</i>	x	x	x	x	x	50,000	<i>ITU though it's Partners</i>
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Table 5. Pillar 4 - Preparedness and Response Capabilities

PILLAR 4: PREPAREDNESS AND RESPONSE CAPABILITIES												
Gap Identified	Associated Output	Output indicator	Activities	Responsibility		Implementation Timeline					Budget, USD / LCU	Budget Source
				Lead	Support	Year 1	Year 2	Year 3	Year 4	Year 5		
Gap4.1 <i>Lack of harmonization between Anticipatory Action (AA) and Emergency Preparedness Plans at district level</i>	Output4.1 <i>District-level preparedness and AA plans harmonized and aligned with national DRM frameworks</i>	<i>Number of districts with harmonized AA and preparedness plans.</i>	Activity 4.1.1 <i>Map existing district- level preparedness plan and identify</i>	TRCS	FRC, PMO, VPO, DP, NGOs, CSOs, Private Partners.	x		x		x	N/A	IFRC, Development Partners, Private Partners
		<i>Number of District prepared plan reviewed</i>	Activity 4.1.2 <i>Review District Emergence Preparedness Plan to</i>	TRCS	FRC, PMO, VPO, DP, NGOs,	x			x	x	36,000	IFRC, Development Partners,

			incorporate the Anticipatory Action Protocol		CSOs, Private Partners.							Private Partners
		Number of workshops conducted	Activity 4.1.3 Conduct stakeholder workshops for awareness of reviewed District Emergency Preparedness plan at district level	TRCS	FRC, PMO, VPO, DP, NGOs, CSOs, Private Partners.	x		x	x		36,000	IFRC, Development Partners, Private Partners
Gap4.2 Lack of anticipatory actions framework for the identified and prioritized hazards at the Subnational level	Output 4.2 Availability of Anticipatory Actions framework for different prioritized hazards	Number of AA framework developed	Activity 4.2.1 Develop anticipatory actions framework for the identified and prioritized Hazards.	TRCS	FRC, PMO, VPO, DP, NGOs, CSOs, Private Partners.		x		x	x	18,000	IFRC, Development Partners, Private Partners
		Number of awareness conducted	Activity 4.2.2 Create awareness for partners on anticipatory actions framework for the identified and prioritized Hazards.	TRCS	FRC, PMO, VPO, DP, NGOs, CSOs, Private Partners.		x		x	x	36,000	IFRC, Development Partners, Private Partners
		Number of simulation exercises conducted	Activity 4.2.3 Conduct simulation exercises, test triggers and early actions	TRCS	FRC, PMO, VPO, DP, NGOs, CSOs, Private Partners.		x	x			72,000	IFRC, Development Partners, Private Partners

Gap 4.3 Inadequate dissemination of early warning information to end users	Output 4.3 Enhanced preparedness and dissemination of early warning information	Number of communication channels and volunteers	Activity 4.3.1 Dissemination of early warning information to the end users through the use of multiple communication channels and volunteers.	TRCS	IFRC, TMA, PMO, VPO, DP, NGOs, CSOs, Private Partners.		x	x			160,000	IFRC, Development Partners, Private Partners
Gap 4.4 Limited awareness about Anticipatory Action at all levels	Output 4.4 Improve the awareness of the community about anticipatory action	Number of AA guidelines developed	Activity 4.4.1 Develop awareness raising guideline on anticipatory action for creating awareness at community level	TRCS	FRC, PMO, VPO, DP, NGOs, CSOs, Private Partners.		x		x	x	12,000	IFRC, Development Partners, Private Partners
		Number of awareness campaign	Activity 4.4.2 Conduct awareness creation about anticipatory actions at Community level.	TRCS	FRC, PMO, VPO, DP, NGOs, CSOs, Private Partners.		x	x			160,000	IFRC, Development Partners, Private Partners
		Number of customized and translated awareness materials	Activity 4.4.3 Translate awareness materials into local languages with special groups and adapt them to reflect cultural contexts.	TRCS	FRC, PMO, VPO, DP, NGOs, CSOs, Private Partners.		x		x		24,000	IFRC, Development Partners, Private Partners
Gap 4.5	Output 4.5	Number of trained Local Disaster	Activity 4.5.1	TRCS	FRC, PMO, VPO, DP,	x		x	x		70,000	IFRC, Development Partners,

Inadequate capacity of Local Disaster Response Teams (LDRTs) for effective response actions	Enhanced capacity of Local Disaster Response Teams (LDRTs) for effective response actions.	Response Teams (LDRTs)	Train LDRTs and first responders on First Aid (FA) knowledge		NGOs, CSOs, Private Partners.							Private Partners
		Procured items	Activity 4.5.2 Procure First Aid materials for training and First Aid services	TRCS	FRC, PMO, VPO, DP, NGOs, CSOs, Private Partners.	x		x	x		24,000	IFRC, Development Partners, Private Partners
Gap 4.6 Outdated Early Warning guidelines and SOPs, and weak coordination mechanisms for Anticipatory Action at national level	Output 4.6 Updated Early Warning SOPs and a functional Anticipatory Action Technical Working Group with PGI integration and resource mobilization.	Reviewed guidelines and SOPs	Activity 4.6.1 Review existing early warning guidelines and SOPs	TRCS	FRC, TMA, PMO, VPO, DP, NGOs, CSOs, Private Partners.	x		x	x		14,000	IFRC, Development Partners, Private Partners
		The presence of regular Anticipatory Action Technical Working Group at least at national level	Activity 4.6.2 Revise and update ToR for Anticipatory Action Technical Working Group - include resource mobilization strategies, integrate PGI into SOPs and coordination structures	TRCS	FRC, TMA, PMO, VPO, DP, NGOs, CSOs, Private Partners.	x		x	x		14,000	IFRC, Development Partners, Private Partners
Gap 4.8 Limited knowledge and awareness of AA for local preparedness	Output 4.8 Practical interventions on AA for local preparedness and effective response	Established set of AA interventions at local level early warning	Activity 4.8.1 Conduct community- based hazard, vulnerability and Capacity Assessments with emphasis on AA and	TRCS	FRC, PMO, VPO, DP, NGOs, CSOs, Private Partners.		x	x			180,000	IFRC, Development Partners, Private Partners

		and enhanced preparedness	indigenous knowledge systems									
			Activity 4.8.2 Develop District contingency plan and integrate AA	TRCS	FRC, PMO, VPO, DP, NGOs, CSOs, Private Partners.		x	x			280,000	IFRC, Development Partners, Private Partners
Gap 4.9 Low community awareness and limited integration of Disaster Risk Reduction (DRR) and Early Warning knowledge into preparedness practices	Output 4.9 Disaster Risk Reduction (DRR) measures integrated into Anticipatory Action (AA) frameworks to strengthen community readiness and early response.	Number of trainings conducted	Activity 4.9.1 Conduct regular training workshops for community volunteers, local leaders, on DRR and Early Warning preparedness.	TRCS	FRC, TMA, PMO, VPO, DP, NGOs, CSOs, Private Partners.	x			x	x	140,000	IFRC, Development Partners, Private Partners
		Number of awareness sessions conducted	Activity 4.9.2 Disseminate localized DRR and Early Warning messages through community-friendly channels such as local radios, visual aids, and traditional communication methods.	TRCS	FRC, TMA, PMO, VPO, DP, NGOs, CSOs, Private Partners.		x	x		x	144,000	IFRC, Development Partners, Private Partners
		Number of awareness session	Activity 4.9.3 Organize awareness sessions at communities to strengthen preparedness,	TRCS	FRC, TMA, PMO, VPO, DP, NGOs, CSOs,		x	x		x	240,000	IFRC, Development Partners, Private Partners

			response, and early action capacity.		Private Partners.							
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Table 6. Inter-Pillar - Governance, Coordination, Advocacy, M&E and Financing for EWS

INTER-PILLAR: GOVERNANCE, COORDINATION, ADVOCACY M&E AND FINANCING FOR EWS												
Gap Identified	Associated Output	Output indicator	Activities			Implementation Timeline					Budget, USD / LCU	Budget Source
				Lead	Support	Year 1	Year 2	Year 3	Year 4	Year 5		
Gap 5.2 Absence of a fully functional Emergency Operations Centre (EOC) and Emergency Response Team (ERT) at subnational level	Output 5.2 Operationalization of EOCs at subnational level and establishment of ERT	Number of Locations and equipments Identified	Activity 5.2.1 Identify the location for establishing the EOC and determine the equipment requirements in 19 Regions	PMO	PMO-RALG, MDAs, non state actors	x	x	x	x	x	NIL	

		Number of ERT members nominated	Activity 5.2.2 Identify and nominate Emergency Response Team (ERT) members in 19 regions	PMO	PMO-RALG, MDAs, non state actors	x	x	x	x	x	NIL	
		Number of equipments Procured	Activity 5.2.3 Procure and installation of EOCs equipments	PMO	PMO-RALG, MDAs, non state actors	x	x	x	x	x	570,000	Govern ment of Tanzania, Develop ment Partners, UN Agencies, NGOs
		Number of staff trained	Activity 5.2.4 Conduct training for EOC staff and ERT members to build operational capacity	PMO	PMO-RALG, MDAs, non state actors	x	x	x	x	x	285,000	Govern ment of Tanzania, Develop ment Partners, UN Agencies, NGOs
Gap 5.3 Absence of National Integrated Standard Operating Procedures	Output 5.3 National integrated SOP for sharing Early Warning	Report	Activity 5.3.1 Review the existing communication procedures to identify strengths, gaps, and areas for harmonization in sharing early warning information	PMO	PMO-RALG, RS, LGAs, TMA, GST,		x		x	x	20,000	Govern ment of Tanzania, Develop ment Partners

(SOPs) for sharing early warning information among institutions	information developed				MRCC, PHEOC,							UN Agencies, NGOs
		National Integrated SOPs	Activity 5.3.2 Develop National Integrated Standard Operating Procedures (SOPs)	PMO	PMO-RALG, RS, LGAs, TMA, GST, MRCC, PHEOC,		x		x	x	20,000	Government of Tanzania, Development Partners, UN Agencies, NGO
		Workshop report	Activity 5.3.3 Conduct a stakeholder workshop to validate the SOPs.	PMO	PMO-RALG, RS, LGAs, TMA, GST, MRCC, PHEOC,		x		x	x	30,000	Government of Tanzania, Development Partners, UN Agencies, NGOs
Gap 5.4 Inadequate resources for sustainable implementation for EW4All roadmap	Output 5.4 Resources mobilization conducted	Number of Experts trained	Activity 5.4.1 Conduct training for experts on proposal development to enhance their capacity in preparing high-quality funding proposals	PMO	MoF, TMA, TCR A, TRCS,	x			x	x	15,000	Government of Tanzania, Development Partners, UN

												Agencie s, NGOs
		Number of Proposals	Activity 5.4.2 Develop a comprehensive proposal for mobilizing financial resources to support the implementation of the EW4All Roadmap	PMO	MoF, TMA, TCRA, TRCS,	x		x	x	x	15,000	Govern ment of Tanzania, Develop ment Partners, UN Agencies, NGOs
		Number of stakeholders engaged	Activity 5.4.3 Engage private sectors, CSO and international organizations, to leverage resources and expertise for the implementation of EW4All roadmap	PMO	TMA, TCRA, TRCS,	x	x	x	x	x	10,000	Govern ment of Tanzania, Develop ment Partners, UN Agencies, NGOs
Gap 5.5 Insufficient resources to support project management, monitoring and	Output 5.5.1 monitoring and evaluation (M&E) framework established.	Number of softwares and tools procured	Activity 5.5.1.1 Procurement and application of modern technology and data analysis for an effective project management and monitoring & evaluation (M&E)	PMO	TMA, TCRA, TRCS,	x		x		x	20,000	Govern ment of Tanzania, Develop ment Partners, UN

evaluation (M&E)												Agencie s, NGOs
	Output 5.5.2 Enhanced project management capacity among key institutions and experts	Number of trainees	Activity 5.5.2.1 Training for project management and Monitoring & Evaluation (M&E)	PMO	TMA, TCRA, TRCS,	x		x		x	15,000	Govern ment of Tanzania, Develop ment Partners, UN Agencies, NGOs
Gap 5.6 Need to coordinate implementation of EW4All Roadmap by enhancing the pillar leads to oversee the project harmonize the implementation	Output 5.6 Effective implementation for EWS.	Number of meeting supported	Activity 5.6.1 Support quarterly meetings of pillar leads and focal points to coordinate, monitor, and align activities for effective implementation of the EW4All Roadmap	PMO	TMA, TCRA, TRCS,	x	x	x	x	x	80,000	Govern ment of Tanzania, Develop ment Partners, UN Agencies, NGOs
		Number of meeting supported	Activity: 5.6.2 Support meetings of the National Technical Committee for Disaster Management to oversee and provide directive on the effective implementation.	PMO	MDAs, TMA, GST, AG, FRF	x	x	x	x	x	200,000	Govern ment of Tanzania, Develop ment Partners, UN

												Agencies , NGOs
Gap 5.7 Limited awareness among stakeholders on the EW4All Roadmap's objectives, and implementation framework.	Output 5.7 Increased awareness among stakeholders on the EW4All Roadmap	Number of meeting conducted	Activity 5.7.1 Support a national stakeholders' meeting to create awareness on EW4All initiatives and promote stakeholder engagement	PMO	MDAs, Non government actors	x	x		x	x	50,000	Government of Tanzania, Development Partners, UN Agencies, NGOs



05

IMPLEMENTATION STRUCTURE AND APPROACH

5.1 Coordination Mandate

The EW4All initiative in Tanzania is implemented through a coordinated national mechanism led by PMO–DMD, which ensures that all actions are aligned with the country’s disaster risk management and development priorities. The PMO–DMD provides high-level leadership, policy integration and overall coordination to ensure that EW4All actions are embedded within national disaster risk management and development frameworks.

Oversight is provided by the National Disaster Management Technical Committee (NDMTC), which convenes quarterly to review progress, resolve cross-sectoral challenges and provide technical guidance on policy alignment. The NDMTC is composed of Permanent Secretaries and heads of early warning institutions and also engages the private sector, civil society, and development partners where appropriate. Through its mandate, the NDMTC strengthens coordination, endorses joint workplans, validates technical outputs and ensures that EW4All activities align with the Disaster Management Act No. 6 of 2022, the Tanzania Meteorological Authority Act No. 2 of 2019, and the Third Five-Year Development Plan (FYDP III) 2021/22–2025/26. By bridging policy, technical and operational levels, the Committee ensures that early warning systems are not only technically sound but also inclusive, actionable and responsive to the needs of communities.

To support day-to-day implementation, a National Technical Working Group (TWG) chaired by PMO–DMD with the Tanzania Meteorological Authority (TMA) serving as technical secretariat has been established. The TWG has engaged MDAs, Local Government Authorities (LGAs), academia, civil society, private sector and development partners to ensure a whole of society approach that places communities at the centre of early warning services

5.2 Implementing Entities

Implementation of EW4All in Tanzania is driven by National Pillar Leads, each responsible for advancing one of the four pillars while working in close collaboration with their corresponding Global Pillar Leads to ensure technical coherence, access to international best practices and mobilization of resources.

Table 7. National Pillar Leads

Pillars	Pillar Leading Agency
Pillar 1: Disaster knowledge	Prime Minister’s Office– Disaster Management Department
Pillar 2: Detection, Observation, Monitoring, Analysis and Forecasting of Hazards	Tanzania Meteorological Authority
Pillar 3: Warning Dissemination and Communication	Tanzania Communication Regulatory Authority
Pillar 4: Preparedness and response strategies	Tanzania RedCross Society

Each Pillar Lead mobilizes resources, engages stakeholders, reports on progress and ensures delivery of impactful results. To maintain continuity, each institution has designated a focal point and an alternate, supported by a joint and regularly updated national workplan.

Beyond the Pillar Leads, implementation will involve a wide range of actors to ensure a multi- sectoral and inclusive approach:

- i. **Sectoral Ministries, Departments, and Agencies (MDAs):** Vice President's Office (Environment), Ministry of Finance and Planning, Ministry of Works and Transport, Ministry of Agriculture, Ministry of Health and PO–RALG.
- ii. **Local Government Authorities (LGAs):** ensuring localized implementation and direct community engagement.
- iii. **Development Partners: UNDP, WFP, ITU, GSMA,** Dar es Salaam Maritime Institute (DMI), among others, providing financial, technical and capacity-building support.
- iv. **Civil Society and Non-State Actors:** NGOs, academia, research institutions, private sector entities, mobile network operators and community-based organizations to foster innovation and outreach.

Special emphasis is placed on inclusive participation, ensuring that early warning information reaches all people, especially the most vulnerable. Collaboration with the Ministry of Transport and grassroots organizations such as SHIVYAWATA (representing persons with disabilities), women's associations, youth groups, and other community-based organizations will guarantee that early warning systems are accessible, inclusive and leave no one behind.

5.3 Investment and Funding Arrangements

Implementation of the Early Warnings for All (EW4All) initiative in Tanzania is supported through a blended investment model that combines government budget allocations, donor contributions and private sector engagement. This approach ensures sustainability, predictability and shared ownership of early warning system development.

The Government of Tanzania through key implementing agencies will allocate domestic resources to finance critical activities, including institutional strengthening, human resource development, and integration of EW4All actions into national disaster risk management and climate adaptation frameworks.

A core principle guiding EW4All investments is to leverage established, proven funding and programming mechanisms. In Tanzania there are ongoing programmes that will contribute to the implementation of the roadmap such as the Climate Risk and Early Warning Systems Initiative (CREWS) and the Systematic Observations Financing Facility (SOFF).

Development partners are playing a pivotal role in catalyzing early investments. Denmark, through its Ministry of Foreign Affairs, has committed funding to support the initial phase of EW4All implementation in Tanzania. Additional support is provided by organizations such as UNDRR, ITU, UNDP, WFP, GSMA, IFRC, UNICEF and FCDO helping to drive technical assistance, infrastructure development and capacity-building initiatives.

The EW4All initiative in Tanzania will be executed by a broad coalition of development partners including United Nations agencies, multilateral development banks and operational actors. These entities will mobilize resources through a combination of funding streams such as the Green Climate Fund (GCF), Adaptation Fund (AF) and Global Environment Facility (GEF) along with internal resources like the International Development Association (IDA) financing from the World Bank.





06

MONITORING & EVALUATION

Monitoring and Evaluation (M&E) of the EW4 All roadmaps will be coordinated by the Prime Minister's Office (PMO) in close collaboration with TMA and the National Pillar Leads. A structured M&E framework will be adopted to track progress, enhance accountability, and support adaptive management throughout the project lifecycle.

Each National Pillar Lead will be responsible for compiling quarterly, mid-year, and annual progress reports. These reports will document achievements, implementation challenges, and lessons learnt and will be shared with all stakeholders to promote transparency and cross-pillar learning. TMA, as the project lead, will provide technical oversight and coordinate with PMO to ensure consistency in reporting and integration into national systems.

Quarterly coordination meetings will bring together all pillar leads to assess implementation progress and resolve emerging challenges. Monitoring tools will include activity trackers, stakeholder feedback mechanisms, and indicator-based scorecards aligned with the EW4All core capability checklist. A digital monitoring platform will be explored to enable real-time tracking of implementation milestones.

Periodic evaluations, including mid-term and end-line assessments, will be conducted to evaluate the roadmap's effectiveness, relevance, and impact. Where possible, independent reviewers or development partners will be engaged to ensure objective assessments and strategic recommendations for future scaling and improvement.

The intent of this M&E plan is to encourage maximum performance, efficiencies, and cost-effectiveness of the project, and it contains, among other elements, the indicators and benchmarks for performance management. This M&E plan has set ambitious yet attainable results and is aligned with the proposed activities in the project work plan.

The M&E plan and its implementation reports will also be used to highlight results that are worth publicizing and thereby offer a communication platform for disseminating information to all interested parties.



Table 8. Results Framework Matrix for Early Warning Roadmap

	Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Timeframe	Responsible
PILLAR 1:	PILLAR 1: DISASTER RISK KNOWLEDGE				
GAP 1	Inadequate inclusion of other hazards in Tanzania Risk Profile for Floods and Droughts of 2019				
Output 1.1	Reviewed and Updated Tanzania Risk Profile for floods and drought of 2019	Updated National Disaster Risk Profile in place	Review of assessment report	5yrs	PMO-DMD
Activity 1	Review and update the Tanzania Risk Profile for floods and drought of 2019	Number of hazards included in National Disaster Risk profile	Review of the Risk Profile document	5yrs	PMO-DMD
Activity 2	Conduct 2 stakeholders' workshop for advocacy and Dissemination	Number of workshops and stakeholders reached	Review of workshop report	5yrs	PMO-DMD
GAP 2	Absence of Inventories & databases on exposure and vulnerability factors on different sectors				

Output 1.2	Vulnerability and exposed database in place				
Activity 1	To conduct the assessment on vulnerability & exposure from different stakeholders	Assessment report	Review of project implementation report	5yrs	PMO-DMD
Activity 2	Development of Vulnerability database.	Vulnerability Database in place	Review of project implementation report	5yrs	PMO-DMD
Activity 3	Capacity building in database management	Number of trained staff	Review of workshop report	5yrs	PMO-DMD
GAP 3	Absence of open-access National Disaster information platform				
Activity 1	To develop DMIS platform	DMIS installed	Review of project implementation report	5yrs	PMO-DMD
Activity 2	To conduct user Acceptance test of DMIS Platform.	Number of users engaged	Review of project implementation report	5yrs	PMO-DMD
Activity 3	System deployment and user raining	DMIS in place	Training report	5yrs	
GAP 4	Absence of Maps showing Evacuation center and routes in five regions				

Output 1.4	Evacuation Centers and routes are clearly mapped	Maps on evacuation centers developed	Review of project implementation report	5yrs	PMO-DMD
Activity 1	Conduct assessment to identify evacuation areas and routes in 19 regions	Number of evacuation centers and routes identified in 5 regions	Project implementation report	5yrs	PMO-DMD
Activity 2	To develop digital map on evacuation areas and safe routes	Digital Map in place	Report	5yrs	PMO-DMD
Activity 3	Conduct awareness sessions to Disaster Management committees, communities and first responders on the existence and utilization of evacuation areas and routes	Number of awareness sessions and trainings conducted	Review of report	5yrs	PMO-DMD
GAP 5	Absence of National Integrated Standard Operating Procedures among early warnings Institutions				
Output 1.5	Standardized operation procedures among Early Warning Institution in place	Maps on evacuation centers developed	Review of project implementation report	5yrs	PMO-DMD
Activity 1	Review the existing communication methodology	Updated communication methodology in place	Review of project implementation report	5yrs	PMO-DMD

Activity 2	Develop National Standard Operation Procedures for sharing Early Warning Systems	Report	Report	5yrs	PMO-DMD
Activity 3	Conduct a stakeholder's workshop to validate SOPs	Number of workshops	Training report	5yrs	PMO-DMD
PILLAR 2:	DETECTION, OBSERVATION, MONITORING, ANALYSIS AND FORECASTING				
Gap 2.1	Insufficient observational and monitoring capacity				
Outcome	Improved TMA capacity in the provision of the early warning information.	Accuracy and timeliness of weather forecast and warnings.	Project implementation report	5yrs	TMA
Output 2.1.1	15 AWS, 30 Automatic Rainfall Stations, 5 agromet Stations, 10 Marine Buoys and 4 AWOS procured, installed and calibrated	Number of weather instruments	Technical report	5yrs	TMA
Activity 1	Procurement, installation and calibration of weather of observation instruments (15 AWS, 30 Automatic Rainfall Stations, 5 gromet Stations, 10 Marine Buoys and 4 AWOS)	Number of weather instruments and stations procured and installed	Review of procurement / Technical report	5yrs	TMA

Gap 2.2	Inadequate uptake of emerging technology in Weather analysis and forecasting				
Output 2.2.1	Enhanced national capacity in weather radar operationalization routine maintenance and calibration	Competency in Radar maintenance, calibration and operationalization		5yrs	TMA
Activity 1	Develop and implement a routine maintenance and calibration plan.	Maintenance plan in place and implemented	Maintenance report	5yrs	TMA
Activity 2	Train radar technicians/ engineers and users	Number of staffs trained	Training report	5yrs	TMA
Output 2.2.2	Forecasts and products generated by AI, Machine Learning and Cloud-based Technologies	Percentage adoption of emerging technology	CT/Technical report	5yrs	TMA
Activity 1	Pilot AI/ML based forecasting using models using historical and real-time data.	Percentage of forecasts generated using AI, ML and cloud-based technologies.	Project implementation report	5yrs	TMA

Activity 2	Develop and validate weather and climate products generated using AI, ML and cloud-based technologies.	Number of products	Project implementation report	5yrs	TMA
Activity 3	Train TMA experts in generating weather/climate forecast using AI, ML and cloud-based technologies.	Number of trained staff	Training report	5yrs	TMA
Output 2.2.3	Twinning and regional cooperation programs conducted to strengthen uptake of emerging forecasting technologies and provide technical support to other countries.			5yrs	TMA
Activity 1	Provide technical support and share knowledge with other NMHSs in the region.	Number of NMHSs in other countries supported	Project implementation report	5yrs	TMA
Activity 2	Identify and formalize partnerships with regional/global centers of excellence.	Number of twinning/exchange programs conducted	Project implementation report	5yrs	TMA

Activity 3	Conduct exchange visits, joint training, and mentorship programs	Number of joint training, and mentorship programs	Project implementation report	5yrs	TMA
Gap 2.3	Insufficient capacity in packaging and dissemination of weather and climate information to end users in a timely manner				
Output 2.3.1	Common Alerting Protocol (CAP) platform integrated among key stakeholders for multi-hazard early warning dissemination	Number of stakeholders integrated	Stakeholder's analysis report	5yrs	TMA
Activity 1	Organize awareness raising seminars to Stakeholders about CAP	Number of stakeholders received awareness seminars	Stakeholder's analysis report	5yrs	TMA
Output 2.3.2	Enhanced packaging and dissemination of weather and climate services	Number of products disseminated		5yrs	TMA
Activity 1	Procurement of software for preparations and processing of weather and climate information	Number of equipment and software procured.	Project implementation report	5yrs	TMA
Activity 2	Engage the community radios for dissemination of weather and climate to wider areas	Number of community radios engaged	Project implementation report	5yrs	TMA

Activity 3	Train the TMA technical staff in developing packing and communicating weather and climate information.	Number of trained staff	Project implementation report	5yrs	TMA
Activity 4	Engage broader participation of stakeholders in co-production of weather and climate services	Categories/groups of stakeholders in co-production of weather and climate services	Project implementation report	5yrs	TMA
Activity 5	Translate forecasts into simplified formats and language.	Tailored products co developed	Project implementation report	5yrs	TMA
GAP 2.4	Insufficient communication infrastructure to support automated data transmission				
Output 2.4.1	Enhanced communication infrastructure for automated data transmission	Number of infrastructure automated	Project implementation report	5yrs	TMA
Activity 1	Procurement and install modern communication hardware and software (e.g server routers and moderns, VSAT, GSM.	Number of communication devices installed	Technical/ICT Report	5yrs	TMA
Output 2.4.2	Upgraded Climate Data Management System (CDMS) with additional backup functionalities and cyber threat features				

Activity 1	Upgrade CMDM Software and hardware	Climate data management system (CDMS) in place	Technical/ICT Report	5yrs	
PILLAR 3:	WARNING DISSEMINATION AND COMMUNICATION				
Gap 3.1	Tanzania is yet to ratify the Tampere Convention				
Output 3.1	Tampere Convention ratified by Tanzania	Ratification of the Tampere Convention	Project implementation report	5yrs	TCRA
Activity 1	Conduct awareness to key stakeholders on the importance of Tanzania ratifying the Tampere Convention.	Number of stakeholders engaged	Stakeholders engagement report	5yrs	TCRA
Activity 2	Follow up the processes of ratifying the Tampere Convention.	Tanzania ratify the Tampere Convention	Project implementation report	5yrs	TCRA
Gap 3.2	Limited accessibility of early warning messages to end users in high- risk areas via mobile networks				

Output 3.2.1	Enhanced accessibility of early warning to end users through multi communication channels	Increased the use of SMS to reach high risk areas	Review of assessment report	3yrs	TCRA
Activity 1	Coordinate training and awareness for key stakeholders to integrate and utilize information from the Common Alerting Protocol (CAP), ensuring accessibility of early warning information.	Number of awareness and trainings	Review of assessment report	5yrs	TCRA
PILLAR 4:	PREPAREDNESS AND RESPONSE CAPABILITIES				
GAP 4.1	Lack of harmonization between Anticipatory Action (AA) and Emergency Preparedness Plans at district level				
Output 4.1	District-level preparedness and AA plans harmonized and aligned with national DRM frameworks				
Activity 1	Map existing district-level preparedness plan and identify	Number of districts with harmonized AA and preparedness plans.	Review of stakeholder's engagement report	5yrs	TRCS
Activity 2	Review District Emergence Preparedness Plan to incorporate the Anticipatory Action Protocol	Number of plans reviewed	Review of project implementation report	5yrs	TRCS

Activity 3	Conduct stakeholder workshops for awareness of the reviewed District Emergency Preparedness plan at district level.	Number of workshops conducted	Review of workshop report	5yrs	TRCS
GAP 4.2	Lack of anticipatory actions framework for the identified and prioritized hazards at the Subnational level				
Output 4.2	Availability of Anticipatory Actions framework for different prioritized hazards	Presence of actions framework	Review of project implementation report	5yrs	TRCS
Activity 1	Develop anticipatory actions framework for the identified and prioritized Hazards.	Number of AA framework developed	Review of report	5yrs	TRCS
Activity 2	Create awareness for partners on anticipatory actions framework for the identified and prioritized Hazards.	Number of awareness conducted	Review of project implementation report	5yrs	TRCS
Activity 3	Conduct simulation exercises, test triggers and early actions	Number of simulation exercises conducted	Review of project implementation report	5yrs	TRCS
GAP 3	Inadequate dissemination of early warning information to end users				

Output 4.3	Enhanced preparedness and dissemination of early warning information				
Activity 1	Dissemination of early warning information to the end users through the use of multiple communication channels and volunteers	Number of communication channels and volunteers	Project implementation report	5yrs	
GAP 4	Limited awareness about Anticipatory Action at all levels				
Output 4.1	Improve the awareness of the community about anticipatory action				
Activity 1	Develop awareness raising guideline on anticipatory action for creating awareness at community level	Number of AA guidelines developed	Project implementation report	5yrs	TRCS
Activity 2	Conduct awareness creation about anticipatory actions at Community level.	Number of awareness campaign	Project implementation report	5yrs	TRCS
Activity 3	Translate awareness materials into local languages with special groups and adapt them to reflect cultural contexts.	Number of customized and translated awareness materials	Training report	5yrs	TRCS
GAP 5	Inadequate capacity of Local Disaster Response Teams (LDRTs) for effective response actions				

Output 4.5	Enhanced capacity of Local Disaster Response Teams (LDRTs) for effective response actions.				
Activity 1	Train LDRTs and first responders on First Aid (FA) knowledge	Number of trained Local Disaster Response Teams (LDRTs)	Review of training report	5yrs	TRCS
Activity 2	Procure First Aid materials for training and First Aid services	Procured items	Review of procurement report	5yrs	TRCS
GAP 6	Outdated Early Warning guidelines and SOPs, and weak coordination mechanisms for Anticipatory Action at national level				
Output 4.6	Updated Early Warning SOPs and a functional Anticipatory Action Technical Working Group with PGI integration and resource mobilization.				
Activity 1	Review existing early warning guidelines and SOPs	Reviewed SOPs	Project implementation report	5yrs	TRCS
Activity 2	Revise and update ToR for Anticipatory Action Technical Working Group - include resource mobilization strategies, integrate PGI into SOPs and coordination structures	Revised document	Project implementation report	5yrs	TRCS
GAP 7	Limited logistics and prepositioning capacity				

Output 4.7	Strengthened logistics system with warehouses and decentralized stockpiles.				
Activity 1	Establish warehouses in high-risk zones.	Number of warehouses established	Review of project report	1yrs	TRCS
Activity 2	Preposition stocks (shelter, health, WASH).	Number of stock	Project implementation report	5yrs	TRCS
GAP 8	Limited knowledge and awareness of AA for local preparedness				
Output 4.8	Practical interventions on AA for local preparedness and effective response				
Activity 1	Conduct community-based hazard, vulnerability and Capacity Assessments with emphasis on AA and indigenous knowledge systems	Assessment report	Project implementation report	.	TRCS
Activity 2	Develop District contingency plan and integrate AA	Plan in place	Project implementation report	5yrs	TRCS
GAP 9	Limited knowledge and awareness of AA for local preparedness				
Output 4.9.1	Practical interventions on AA for local preparedness and effective response				

Activity 1	Conduct regular training workshops for community volunteers, local leaders, on DRR and Early Warning preparedness.	Number of trainings conducted	Project implementation report	1yr	TRCS
Activity 2	Disseminate localized DRR and Early Warning messages through community-friendly channels such as local radios, visual aids, and traditional communication methods.	Number of awareness sessions conducted	Project implementation report	2yrs	TRCS
Activity 3	Organize awareness sessions at communities to strengthen preparedness, response, and early action capacity.	Number of awareness sessions	Project implementation report	2yrs	TRCS

6.1 Project Evaluation

The evaluations are to be conducted during the annual cycle of the project implementation as per the project activities calendar. Data collected during monitoring will be vital during the evaluation process with evaluation questions, the methodology, the timeframe and the responsible organization. The evaluations intend to obtain evidence as to whether the interventions and outputs achieved have led to the achievement of the outputs and outcomes. Evaluation will be conducted by external experts out of implementing entities to avoid biasness.

6.2 Reporting

Implementation of the Early Warning project will be monitored on a regular basis and the report will be submitted to the key stakeholders including National Disaster Management Committee, donors and Project Technical Committee. Meetings will be organised to review project implementations reports and approval of necessary adjustment for project success. Assessment of progress made will be done for each semi-annual to highlight areas that need adjustment to ensure the project is on the right track and delivers results. Furthermore, there will be a proper flow of reports between M&E experts, TMA management, the technical committee and the project steering committee for decision-making.

6.3 Theory of Change

Theory of change will be employed to ensure the project resources transformation process leads to the expected outputs and outcomes for strengthening early warning systems to realize the overall purpose of protecting life and reducing economic losses.



Figure 1. Theory of Change

PILLAR LEADS

GLOBAL PILLAR LEADS



NATIONAL PILLAR LEADS



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